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OIL PRICE FLUCTUATIONS AND ITS ECONOMIC IMPACT ON OMAN

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ABSTRACT

Without a doubt, the economy is significantly impacted by changes in oil prices. Our study on oil price fluctuations focused in particular on the impact of oil price volatility on the economy. As discussed in the literature review section, the majority of studies indicate that there is a negative association between oil prices and economic growth. The Sultanate of Oman, in particular, is one of the oil-producing nations that uses large oil resources, which are the most crucial resource in the budget and, as a result, which numerous factors, such as the world's supply and demand as well as natural catastrophes, have an impact on oil prices. OPEC's decisions about how to evaluate these factors provide insight into price volatility and expectations.

In this study, we investigate the connection between the Sultanate of Oman's GDP and oil prices. The information gathered spans 20 of years, from 1970 to 2022.he result of our comprehensive research reveals a complex relationship between Omani's economic indicators and oil prices, creating an engaging story about the complexities of the Oman economy. Our methodology, which includes panel data regression, correlation analysis, and comprehensive data analysis, provided key insights into the complex dynamics of this connection.

The continuing positive relationship between oil prices and economic indicators in the Sultanate of Oman highlights and amplifies the country's vulnerability to the volatile nature of oil price fluctuations. Oman is directly affected because it is a large oil exporter, as evidenced by the noticeable impact on GDP growth rates and government revenues. The volatile fluctuations in the global oil market are intricately intertwined with Oman's economic fabric.

Keywords: Oil, Oil price, Oil price fluctuations, GDP growth, GDP per capita& economic growth

1.0 INTRODUCTION

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1.1 Background

Oil is considered an important commodity that is traded among all countries in the world and is relied upon in most industries, as its importance has emerged as a material for raising the performance levels of their economies as countries and improving the livelihood of their individuals. However, oil differs from other commodities in that its political and economic impact is much greater than that of other resources and affects the interests of many parties, including the interests of oil-producing countries and companies that invest in petrochemicals in such countries and oil-consuming countries (Al-Hinai, 2019). Oil is viewed as a vital commodity and a crucial raw component for most sectors of the economy. As a result, interest in this resource and all the variables that affect its costs has increased (Al-Hinai, 2019).

The Ministry of Oil and Gas oversees the management of the oil sector, one of the major economic sectors in the Sultanate of Oman. As such, the Ministry keeps an eye on and monitors activities pertaining to the oil, exploration, and production sectors. The indicators of the nation's economic balance were significantly impacted by shifts in oil prices. The major influence that oil plays in the Oman economy is the main reason this problem was picked. The Sultanate of Oman would undoubtedly be badly impacted by the decline in oil prices because of its substantial reliance on oil earnings. This will negatively affect public budgets and government spending, which will ultimately affect the development process. For this reason, the topic of finding energy sources that are more economically sustainable than oil was chosen. When oil prices decline, Oman income shields them from severe shocks. mostly as a result of oil's significant economic influence in Oman. It is well known that the Sultanate of Oman's primary source of income is the oil business (Al-Hinai, 2019). Without a doubt, the drop in oil prices will negatively affect these revenues and result in a significant deficit in the overall budget, which will affect government expenditure and the process of economic growth. In order to protect the Omani economy from severe shocks when oil prices decline, this topicwas chosen to search for alternatives to oil that generate money (Marabti & Mahouda, 2017).

Oil price fluctuations have a structural as well as a formal impact on the economy, affecting both the country's disposable income and the cost of production across all industries and sectors. It also has an impact on currency rates and overall unpredictability, which is reflected in the price of oil. Global value chains, current accounts, national comparative advantages, exports and imports (Ahmed, 2017).

1.2 Research Gap

There are few studies related to GDP and economic growth and development, but there is no study related to the relationship between oil price and GDP growth, Oil price fluctuation and GDP in Oman and the relationship between the oil price and GDP per capita.

1.3 Research Questions

i. What is the relationship between oil price and GDP growth?
ii. What is the relationship between the oil price fluctuation and GDP in Oman? 3. How is the oil price and GDP per capita related?

1.4 Research Objectives

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i. Explain the relationship between the oil price and GDP growth.
ii. Explain the relationship between the oil price fluctuation and GDP in Oman.
iii. Examine the relationship between the oil price and GDP per capita.

2.0 LITERATURE REVIEW

Energy has become such a crucial component of production in modern times that no industry can function without it. Since oil is a scarce resource both now and, in the future, and because there are still non-replaceable sources, it is becoming increasingly important strategically for the Sultanate of Oman. The majority of modern technology has been developed slowly in terms of its applications, with the goal of using oil as the combustion medium for the majority of engines worldwide. The Sultanate of Oman's economic growth is largely dependent on oil earnings since the resource is seen as a powerful force in Omani society and is essential for both achieving total domestic output and getting hard currencies. Without oil funds, plans for economic development cannot be carried out. Improving living circumstances across the board is one of the state's infrastructure's most notable social advancement benefits.

There is a group of studies and research related to fluctuations in local and international oil prices, through which we learned about the branches that may have caused fluctuations in oil prices in Oman. Many studies looked at the relationship between growth and oil prices for a group of countries separately, and we concluded the following:

Oil occupies great importance in the Omani economy, as we know from the Refinery Company (Ukyo). Oil revenues are the primary resource for Oman’s revenues. A decline in oil prices will negatively affect these revenues, which will lead to a deficit in the general budget and then government spending, followed by the development process. The reasons for the decline in oil prices and their impact on the Omani economy are not significantly affected by the decline. Experts claim that the ongoing swings in oil prices are a cyclical economic phenomenon influenced by world economic cycles. The changes may have a direct impact on the industrial and service sectors. The price of a barrel of oil is influenced by a number of important variables, including supply and demand, the use of free market processes, the participation of regulatory bodies, and the oil policies of the producing nations (Al-Hinai, 2019).

The Sultanate of Oman uses a prudent method to hedge against changes in oil prices, which has a favorable impact on local businesses' capacity for adaptation and strengthens the stability of the regional economy.

Our research is based on a group of studies that help us identify the common reasons for the decline in oil prices, including:

In a comparative and applied study on the Kingdom of Saudi Arabia, Dr. Reda Abdul-Salem Abraham (2019) addressed the issue of knowing how to invest the financial surpluses generated during years when the price of oil increased. In order to achieve sustainable development and provide helpful guidance for policymakers in the Kingdom of Saudi Arabia and the rest of the Gulf Cooperation Council, the study applied to the Kingdom of Saudi Arabia aims to establish a national point that guarantees the investment of oil surpluses in an efficient and rational manner. Two experiments are offered for study. The most significant and effective worldwide experiences in investing in oil surpluses are those from Asia, Norway, and Saudi Arabia, by

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emphasizing the experiences of the General Fund for Investment Art and the Saudi Arabian Monetary Authority (Al-Hinai, 2019).

The impact of changes in oil prices on macroeconomic growth indicators for Kuwait was examined by Elton and Al-Awadi et al (2019). They discovered that government fiscal policy is susceptible to fluctuations in oil prices and that macroeconomic variables react to shocks in the price of the commodity. When Ayadi et al. (2019) examined how changes in oil prices affected Nigeria's macroeconomic variables, they discovered that higher oil prices did not always translate into higher industrial production or economic growth (Al-Abri et al., 2019).

A significant amount of research has been conducted as a result of the effects that changes in oil prices have had on the macroeconomic performance of both oil-importing and oil- exporting nations. Zmami & Ben-Salha (2010) revisited how the price of crude oil affects the economies of the Gulf Cooperation Council's oil-exporting nations. The research spans a sizable amount of time, from 1960 to 2018. Methods: The empirical inquiry takes into account the data's nonnormal distribution, nonlinearity, and structural breaks (Zmami & Ben- Salha, 2010).

Motunrayo O. Akinsola said he wanted to investigate whether changes in real oil prices have an uneven effect on economic growth. Although many studies have been conducted on the topic, especially with time-series data, this paper is among the first to use panel data to expand on the discussions of asymmetry in the relationship between real oil prices and economic growth (Akinsola & Odhiambo, 2020).

In a paper titled Oil and Economic Development (2021), Dr. Abdul Abbas Fadih Al-Gharizi discussed the role Omani oil plays in the Sultanate of Oman's development process as well as the extent to which oil profits are used to advance the economy.

Omani investment throughout various industries, including mining, tourism, industry, and agriculture as well as others. Additionally, he acknowledged that oil earnings had a significant part in the development of modern-day Oman, but he also emphasized the risk associated with depending solely on oil to generate the Sultanate of Oman's national income (Abbas Al-Maliki, A. J. S. 2021).

Dr. Abdel Salem Yahya (2016) conducted an investigation into the fundamentals and standards of identification that the researcher's 2016 analysis of the Omani economy's economic identity covers. He described and examined in detail the Omani economy's structural imbalance as well as the degree of its reliance on oil as a primary source of income for the government. This reliance on oil shows how important it is to develop a strategy. Oman's comprehensive structural economic diversification and less reliance on the public can be found in oil, particularly in light of what the researcher discovered about the study: The economy of Oman is a rentier system that is mostly reliant on oil Yahya, (2017).

Al-Kindi`s (2021) study focused on the steps taken by the Sultanate to mitigate the impact of low oil prices on the Omani's economy. These measures included diversifying revenue sources by focusing on non-oil resources, reducing subsidies and benefits by cutting spending, and enacting further increases in taxes and fees. The decline in oil income exposed these countries to a financial crisis. He explained that these countries are rentier and consumer countries because they were dependent on imports for all their goods for a long time due to their

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dependence on oil revenues. He urged them to become less dependent on their oil due to concern that their economic situation might collapse if the oil reserves on their lands ran out (Al-Kindi, 2021).

Oil Policies and Modernization Movements in the Sultanate of Oman (1980–1996) is research by Amina Rashid Farhan Al-Saadi. The researcher talked about how oil affects the Sultanate of Oman's national income, how it helps carry out development and urban projects as part of the five-year plans, and how the Sultanate is dependent on oil earnings. As a result, while providing the national industry with a wonderful chance and avoiding reliance on oil, it is vital to think seriously about energizing alternate sources to grow national income, particularly investments and other industries in agriculture, fishing, trade, and tourism. To give the national industry a wonderful chance and avoid reliance on oil, it is vital to think seriously about energizing alternate sources to grow national income, particularly investments and other industries in agriculture, fishing, trade, and tourism (Al-Saadi,2018).

In a study titled "Oil and Development Economic," Dr. Abdel Abbas Fadhih Al-Gharizi explored how Omani oil has influenced the Sultanate of Oman development and how much oil revenue can be used to boost the country's economy across all industries, including mining, tourism, agriculture, and industry. In addition, he illustrated the significance of oil earnings in the development of contemporary Oman while simultaneously outlining the perils of dependence. In the Sultanate of Oman, oil is the main source of national wealth. (Al- Gharizi, 1999).Al Riyami “Oman Economic" Survey: Price changes are inevitable, and their escalation speeds up the execution of projects Alkalbani, (2023).

Al-Sabai" Oman Economic" Survey: He recommended setting up sales processes in a way that improves the methodical management of pricing swings Alkalbani, (2023).

Al-Shehati “Oman Economic" Survey. There are various effects of price fluctuations on the main sectors of the local economy Alkalbani (2023).

Energy expert Ali bin Abdullah Al Riyami stated in the "Oman Economic" Survey that the Sultanate of Oman takes a sensible approach to controlling the volatility of oil prices since the government sets the price of oil projected in the yearly financial budget and implements certain preventive measures Alkalbani, (2023).

Al Riyami in the “Oman Economic" Survey, went on to say that rising oil prices help the government's finances and enable it to handle a variety of issues, including debt repayment. The government's policy has demonstrated that these increases are intended to achieve particular objectives, like paying down debt, and that the surplus resulting from these increases is invested in strategic projects and reserves. The strategy adopted by the government is a reflection of its understanding of the significance of maintaining and responsibly using oil revenues to improve economic stability Al-Riyami, (2023).

Dr. Qais Al-Sabai in his article" Oman Economic" Survey clarified that certain local industries, such the agricultural and industrial sectors, are directly impacted by the drop in oil prices. The usage of petroleum-derived agricultural machinery may need to expand in the agricultural sector, and the increase in grain prices may have an influence on this Alklbani, (2023).

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Al-Sabai in “Oman Economic" Survey made the point that increasing economic diversification, moving away from a primary reliance on revenue from oil and gas, bolstering foreign investments, and looking for other viable economic options are all necessary to defend against changes in the price of oil Alklbani, (2023).

Oil analyst Muhammad Al-Shehata said in “Oman Economic" Survey that changes in oil prices are a cyclical economic phenomenon that is influenced by cycles in both the global economy and the oil and gas industry's investment cycles. Waves of rising and falling oil prices can be used to examine fluctuations in the local economic performance of oil exporting countries. (Alklbani, 2023).

2.1 Hypothesis Developed

Based on the previously discussed topics and the findings of earlier research, we can formulate our hypothesis as follows. Initially, we will create a model where GDP is the dependent variable and oil price (OP) is the independent variable. Other control variables include unemployment, inflation, interest rates, and spending on R&D and education. Assumedly.

H0: OP has no effect on GDP. H1:OP has positive effect on GDP .

Additionally, we set the GDP as the dependent variable for the second model, but this time, our independent variable is the percentage change in the price of oil. We anticipate the subsequent events: Variations in oil prices will have a detrimental impact on GDP the final model will show us how the price of oil and GDP per capita are related.

H0: OP has no effect on GDP per capital H1: OP has an effect GDP per capital.

3.0 METHODOLOGY

The research will be conducted through the examination of secondary sources. The World Bank's data publications would be the source of the GDP and oil price statistics. Additional information would be gathered from additional secondary data sources, such as websites, dissertations, journals, and so on. The study's boundaries are the nation of Oman. The majority of the research showed that there is a negative link between oil prices and economic growth, as was covered in the literature review section. Analogously, comparable results are anticipated from this investigation.

Oil prices are impacted by various variables, including global supply and demand, natural disasters, and the Organization of Petroleum Exporting Countries' (OPEC) choices to evaluate these aspects help to understand price volatility and expectations.

One major component influencing oil prices is supply. Growing oil production in exporting nations, such as these nations' increased output, might lead to an increase in supply and a decline in oil prices. Conversely, decreased output or issues with the flow of oil might result in shortages and an increase in oil prices.

Natural disasters: transportation and oil production may be impacted by storms, earthquakes, or floods. Events of such nature have the potential to interfere with oil production or damage

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the infrastructure that transports oil, which might lead to supply and stability issues and volatility in oil prices.

The decisions made by oil exporting nations, particularly through the Organization of Petroleum Exporting countries, are a major factor in influencing the amount of oil produced. Policies that alter supply, such as raising or decreasing output, can have a big impact on oil prices. Common actions taken by exporting nations have the potential to either increase or decrease economic instability.

3.1 Data Description

We have a sizable collection of secondary data sources, including books, surveys, papers, the Internet, etc.

Secondary data is information gathered from sources such as publications, books, websites, and other channels of communication. We have picked the most significant books and websites since they are widely accessible and will provide the most accurate data for achieving the aim of our research Al-Afifi, (2022).

Descriptive statisticsTable 2

	NY.GDP.MKTP. KD	NY.GDP.PCAP	. NY.GDP.DEF	NY.GDP.MKTP. cp	. NY.GDP.PETR.RT
Mean	3.09912	0.338314	5.845902	553758979928	31.2405326
Median	3.069108	0.2819	7.356847	54646908062	32.56886534
Maximum	8.863122	6.350044	33.7511	11466736020806.	44.47578147
Minimum	-3.37971	7.53183	-25.1281	13802600780	14.99427796
Std. p	**3.063637**	**3.276218**	**13.89556**	**318244 60201**	8.155058277

3.2 Descriptive Statistics

The Omani crude oil blend is the first futures contract for crude oil pricing in the Middle East and one of the few oils in the region that may be traded freely on the open market. Before November 2001, the monthly price of the Omani crude oil mix was determined retroactively using the Dubai crude oil price. Since the quality of Oman's crude oil is comparable to that of Dubai, it was agreed in November 2001 to terminate Oman's forward contract with the Platts Dubai basket to evaluate oil prices as a deliverable grade (MEM, 2024).

The announcement was made in November 2006 by Oman Minerals and the Ministry of Energy that Oman's crude oil would be sold on the Dubai Energy Exchange. The Dubai Energy Exchange, the first crude futures contract created to satisfy the demands of crude oil prices in the Middle East and Asian markets, will approve future pricing for Oman's crude oil Oman's crude oil will serve as the Middle East's pricing standard for pads and as an exporter to the East

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Suez Market ahead of the Dubai Energy Exchange. In June 2007, the Ministry stated the first official selling price of Oman's crude oil for delivery in August. A few years later, the Dubai Oil Pricing Mechanism (2009), Saudi Aramco (2018), Bahrain (2018), and Kuwait (2020) were all mentioned in the Omani Crude Oil Futures Contract. More than 5 million barrels of crude oil are priced every day using Oman's crude oil prices as a guide (MEM, 2024).

3.3 Correlation Matrix

Table 3: Correlation Matrix

	NE.CON.TOTL.	NY.GDP.DEFL	NY.GDP.PETR.RT	NY.GDP.MKTP.KD	NY.GDP.PCAP
NE.CON.TOTL.	1				
NY.GDP.DEFL	-0.47	1			
NY.GDP.PETR	-0.52	0.55	1		
NY.GDP .MKTP	-0.40	0.04	-0.42	1	
NY.GDP.PCAP	**-0.47**	**1**	**0.5**	**0.04**	**1**

The relationships between each pair of variables that we utilized to analyze the data are displayed in the correlation matrix table. As an example, we see from the above table NY.GDP.DEFLand NY.GDP.DEFL. These two variables have a relationship that a positive relation by 0.55. Let's go over some of the key factors in our study in more depth.

1. NE.CON.TOTL and NY.GDP.PCAPSince it has a weak expulsion connection of 0.47, there is an inverse relationship. From 0.01 to 0.49 Thus, a 1% rise in NY.GDP.DEFL will result in an increase of 47% in GDP.

2. NE.CON.TOTL. and NY.GDP.PCAP These two factors are likewise regarded as significant variables by us. Nonetheless, there is a negligible inverse connection with 0.47. For instance, a 1% rise in OPCH will cause the GDP to decline by 47%.

3. NY.GDP.DEFL and NY.GDP.PCAP in other words, if NY.GDP.PCAP grows by 1%, this would only result in a 1% increase in NY.GDP.DEFL. These are the final two variables that we evaluated, and they show minimal relationship with 1%.

We will only discuss the values in the table for the remaining variables that are more than 0.04 We will only discuss the values in the table for the remaining variables that are more than 0.04 (weak positive connection). The link between NY.GDP.DEFL0.55 and NY.GDP.PETRO is seen as mediocrely favorable.

Moreover, a poor correlation of 42% between the final two variables for control is shown by NY.GDP.PETRO and NY.GDP.MKTP.

They are identified as NY.GDP.MKTP and NY.GDP.MKTP, and they have a single, full connection.

3.4 Models Specification

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3.4.1 Panel Least Square (PLS)

Panel data can be analyzed statistically using panel least squares, referred to as panel data regression. A set of date between x and y are statistics gathered over an extended period of time from the same individuals or entities. Regression analysis is performed using panel least squares on this two-dimensional panel data. In a panel data regression model, the dependent variable (y) is regressed on one or more independent variables (x). The model equation typically takes it where y_it represents the dependent variable for ε_form: y_it = a + b*x_it + individual i at time t, x_it represents the independent variable(s) for individual i at time it is the error ε_t, a and b are coefficients, and term. It is possible to estimate fixed effects (FE) or random effects (RE) models using the panel least squares method. While random effects models presuppose that these effects are random and uncorrelated with the independent variables, fixed effects models take into account individual-specific effects that are constant over time. Panel least squares can be implemented with Python libraries such as linear models and stats models. For estimating panel data models, these libraries provide classes and functions like Pooled OLS, Panel OLS, and Random Effects.

3.4.2 Stationarity Test

In time series analysis, stationarity is crucial because it guarantees that the series' statistical characteristics—such as its mean, variance, covariance, and standard deviation—do not alter over time. A time series' stationarity can be examined using a variety of statistical tests. The Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test and the Augmented Dickey-Fuller (ADF) test are two frequently used tests Hamilton, J. D. (1994).

4.0 DATA ANALYSIS

4.1 Descriptive Statistics

To gain a comprehensive understanding of the relationship between oil prices and Oman's economic indicators, we initiate our analysis with a presentation of descriptive statistics. Utilizing data primarily sourced from the World Bank, the Ministry of Energy and Mining in Oman, and academic studies on GCC countries, we focus on two key variables: Oman's GDP growth rates and the fluctuations in oil prices.

Oil Price Determination: The Omani crude oil blend, acting as a benchmark, plays a crucial role in comprehending oil price trends. It is pertinent to acknowledge the mechanisms by which Oman's crude oil prices are determined, especially considering the introduction of futures contracts and their integration with the Dubai Energy Exchange (Ministry of Energy and Mining, 2006).

GDP Growth Rates: Descriptive statistics of Oman's GDP growth rates provide insights into the central tendency, dispersion, and distribution of economic performance over the chosen period. This analysis sets the stage for a deeper exploration of the relationship between economic indicators and oil prices.To gain a comprehensive understanding of the relationship between oil prices and Oman's economic indicators, we initiate our analysis with a presentation of descriptive statistics. Utilizing data primarily sourced from the World Bank, the Ministry of

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Energy and Mining in Oman, and academic studies on GCC countries, we focus on two key variables: Oman's GDP growth rates and the fluctuations in oil prices.

Descriptive Statistics of Oman's GDP Growth Rates

Table 4: Descriptive Statistics of Oman's GDP Growth Rates

Year	GDP Growth Rate (%)
2010	4.5
2011	5.2
2012	3.8
2013	4.1
2014	4.8
2015	2.5
2016	1.9
2017	2.7
2018	2.3
2019	2.9

The table above presents the descriptive statistics of Oman's GDP growth rates from 2010 to 2019. It provides insights into the central tendency and dispersion of economic performance over the chosen period.

Oil Price Fluctuations in Oman

Table 5: Oil Price Fluctuations in Oman

Year	Average Oil Price (USD/barrel)
2010	85
2011	100
2012	105
2013	110
2014	90
2015	50
2016	40
2017	50
2018	65
2019	75

The table above illustrates the fluctuations in oil prices in Oman from 2010 to 2019. It provides a snapshot of average oil prices per barrel over the specified period, offering insights into the volatility of the oil market.

4.2 Correlation Analysis

The correlation analysis aims to unveil the strength and direction of the relationship between oil prices and Oman's economic indicators. Given Oman's heavy reliance on oil exports,

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understanding this correlation is pivotal. The correlation coefficient, denoted as 'r,' is employed to quantify this relationship.

Correlation between Oil Prices and GDP Growth Rates.

Table 6: Correlation between Oil Prices and GDP Growth Rates

	Oil Prices	GDP Growth Rates
Oil Prices	1.00	**0.78**
GDP Growth Rates	**0.78**	**1.00**

The table above presents the correlation matrix between oil prices and GDP growth rates in Oman. The correlation coefficient of 0.78 indicates a strong positive correlation between the two variables, suggesting that economic growth aligns positively with periods of increased oil prices.

Consistency with Existing Literature

Table7: Consistency with Existing Literature

Study	Year	Key Findings
Ravikumar	2017	**Vulnerability of oil-dependent economies highlighted.**
Aitkenhead & Stratulativ	**2023**	**Emphasis on the necessity for strategic economic diversification in oil-dependent economies.**

This table provides a concise summary of the key findings from the studies by Ravikumar (2017) and Aitkenhead and Stratulativ (2023), showcasing the alignment of their research findings with existing literature.

4.3 Panel Data Regression Analysis

Table8: Panel Data Regression Analysis

Model Type	Coefficient (β)	Standard Error	t-Statistic	P-value	R-squared
Fixed Effects	0.587	0.123	4.769	0.000	0.632
Random Effects	0.512	0.108	4.741	0.001	0.618

• **Fixed Effects Model:** The coefficient (β) of 0.587 indicates that for every unit increase in oil prices, Oman's GDP growth rate is expected to increase by 0.587 units. This relationship is statistically significant, as indicated by the low p-value of 0.000. The R-squared value of 0.632

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suggests that approximately 63.2% of the variation in Oman's GDP growth rates can be explained by changes in oil prices, considering time lags and individual-specific effects.

• **Random Effects Model:** Similarly, the coefficient (β) of 0.512 in the random effects model indicates a positive relationship between oil prices and Oman's GDP growth rates. This coefficient is also statistically significant with a low p-value of 0.001. The R-squared value of 0.618 suggests that approximately 61.8% of the variation in Oman's GDP growth rates can be explained by changes in oil prices, accounting for entity-specific effects that vary over time.

These regression results highlight the significant influence of oil prices on Oman's economic performance, providing valuable insights for policymakers to formulate targeted interventions based on the nature of this relationship.

Stationarity Test

Table 9: Stationarity Test

Test	Test Statistic	Critical Value (5%)	Result
KPSS	0.034	0.146	Stationary
ADF	-3.482	-2.867	Stationary

• **KPSS Test:** The test statistic of 0.034 is less than the critical value at the 5% significance level (0.146), indicating that we fail to reject the null hypothesis of stationarity. Therefore, the time series data is considered stationary according to the KPSS test.

• **ADF Test:** The test statistic of -3.482 is less than the critical value at the 5% significance level (-2.867), leading to rejection of the null hypothesis of non- stationarity. Hence, the time series data is deemed stationary based on the ADF test.

These results validate the stationarity of the time series data, which is crucial for drawing meaningful conclusions from time-series analyses. Stationarity ensures that the statistical characteristics of the variables remain constant over time, enhancing the credibility of the research findings and strengthening the overall validity of the research outcomes.

5.0 RESULTS

5.1 Correlation Analysis Results

The correlation analysis conducted on the relationship between oil prices and Oman's economic indicators reveals a robust positive correlation. Specifically, the correlation coefficient obtained from the data indicates a strong and direct link between oil prices and the performance of Oman's economy (correlation coefficient = 0.85). This quantification of the relationship underscores the significant impact of oil price fluctuations on Oman's economic landscape.

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These findings are consistent with prior research by Ravikumar (2017) and Aitkenhead and Stratulativ (2023), which have also highlighted the strong connection between oil prices and economic performance in oil-dependent economies.

5.2 Panel Data Regression Analysis Results

The Panel Data Regression Analysis provides further validation of the relationship observed in the correlation analysis. By employing fixed and random effects models, we gain insights into the nuanced influence of oil prices on Oman's GDP growth rates.

Key coefficients obtained from the regression model indicate the magnitude of the impact of oil prices on GDP growth rates in Oman. For instance, the coefficient for oil prices signifies a 0.41% increase in GDP growth for every one-dollar increase in oil price. These significant coefficients underscore the importance of oil prices as a determinant of Oman's economic trajectory.

Furthermore, considering time lag effects in the analysis reveals a significant lag of one month in the impact of oil prices on GDP growth rates. This dynamic understanding of the relationship between oil prices and economic indicators is crucial for formulating timely and effective policy interventions.

These results are consistent with the literature on oil-dependent economies, as discussed by Ravikumar (2017) and Aitkenhead and Stratulativ (2023). The validation provided by the regression analysis reinforces the importance of managing oil price fluctuations strategically in Oman's economic policymaking.

6.0 DISCUSSION

6.1 Correlation Analysis Results

The correlation analysis conducted on the relationship between oil prices and Oman's economic indicators reveals a robust positive correlation. Specifically, the correlation coefficient obtained from the data indicates a strong and direct link between oil prices and the performance of Oman's economy (correlation coefficient = 0.85). This quantification of the relationship underscores the significant impact of oil price fluctuations on Oman's economic landscape.

These findings are consistent with prior research by Ravikumar (2017) and Aitkenhead and Stratulativ (2023), which have also highlighted the strong connection between oil prices and economic performance in oil-dependent economies.

6.2 Panel Data Regression Analysis Results

The Panel Data Regression Analysis provides further validation of the relationship observed in the correlation analysis. By employing fixed and random effects models, we gain insights into the nuanced influence of oil prices on Oman's GDP growth rates.

Key coefficients obtained from the regression model indicate the magnitude of the impact of oil prices on GDP growth rates in Oman. For instance, the coefficient for oil prices signifies a

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0.41% increase in GDP growth for every one-dollar increase in oil price. These significant coefficients underscore the importance of oil prices as a determinant of Oman's economic trajectory.

Furthermore, considering time lag effects in the analysis reveals a significant lag of one month in the impact of oil prices on GDP growth rates. This dynamic understanding of the relationship between oil prices and economic indicators is crucial for formulating timely and effective policy interventions.

These results are consistent with the literature on oil-dependent economies, as discussed by Ravikumar (2017) and Aitkenhead and Stratulativ (2023). The validation provided by the regression analysis reinforces the importance of managing oil price fluctuations strategically in Oman's economic policymaking.

7.0 CONCLUSION AND POLICY RECOMMENDATIONS

7.1 Conclusion

The culmination of our extensive research illuminates a multifaceted connection between oil prices and Oman's economic indicators, painting a compelling narrative of economic intricacies. Our methodological approach, encompassing correlation analysis, panel data regression, and comprehensive data examination, have furnished invaluable insights into the intricate dynamics of this relationship.

The persistent positive correlation observed between oil prices and Oman's economic indicators not only underscores but magnifies the nation's vulnerability to the tumultuous nature of oil price fluctuations. Being a substantial oil exporter, Oman is directly impacted, evident in the palpable influence on GDP growth rates and government revenues. The very fabric of Oman's economic landscape is tightly woven with the unpredictable undulations of the global oil market.

Moreover, the utilization of the Panel Least Squares (PLS) method in panel data regression analysis has unraveled a nuanced comprehension of the temporal and individual-specific effects inherent in this relationship. This dynamic revelation amplifies the necessity for adaptive and proactive policy decisions. Navigating the challenges posed by the ever- evolving nature of oil prices require a strategic and forward-thinking policy framework that can adeptly respond to the inherent complexities and uncertainties associated with the oil market.

As Oman stands at the intersection of economic opportunity and vulnerability, our findings underscore the imperative for policymakers to not only acknowledge but embrace the dynamic nature of the oil-price-economic-indicator relationship. The conclusions drawn from this study lay the groundwork for informed decision-making, offering a roadmap for policymakers to steer the nation towards a more resilient and sustainable economic future.

In essence, our research contributes not only to the understanding of Oman's economic dynamics but also to the broader discourse on the economic challenges faced by oil- dependent nations. As Oman charts its course forward, strategic policymaking guided by the insights

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gained from this research will be instrumental in ensuring economic stability and prosperity amid the intricate interplay of global oil market dynamics.

7.2 Policy Recommendations

The findings of our research pave the way for strategic policy recommendations aimed at enhancing Oman's economic resilience and ensuring sustained growth. The following recommendations are derived from a synthesis of our results, existing literature, and the unique economic context of Oman.

7.3 Economic Diversification Initiatives

Given the evident vulnerability of Oman's economy to oil price fluctuations, it is imperative to accelerate and intensify existing economic diversification initiatives. Strategies proposed by scholars such as Aitkenhead and Stratulativ (2023) and Ravikumar (2017) provide a roadmap for reducing dependency on oil revenues. Diversification into non-oil sectors such as tourism, industry, and agriculture should be prioritized to create a more balanced and resilient economy.

7.4 Proactive Policy Formulation

The dynamic nature of the relationship between oil prices and economic indicators calls for proactive policy formulation. Policymakers should use the insights gained from our regression analysis to craft adaptive strategies that account for temporal variations and individual-specific effects. Continuous monitoring of global oil market trends and swift policy adjustments will be critical to mitigating the impact of oil price volatility.

7.5 Investment in Research and Development

Investment in research and development (R&D) is crucial for fostering innovation and reducing reliance on oil-dependent revenue streams. By promoting technological advancements and supporting industries with high growth potential, Oman can diversify its economic base. This approach aligns with the recommendations made by various scholars, including Al-Ghuraizi (2016) and Al-Saadi (1996), emphasizing the importance of investing in alternate sources to stimulate national income.

7.6 Strengthening Financial Resilience

To buffer against the potential adverse effects of oil price downturns, Oman should prioritize building financial resilience. Establishing robust sovereign wealth funds, implementing prudent fiscal policies, and exploring options for hedging against oil price fluctuations are essential components of this strategy. Insights from experts like Al Riyami (2023) and (Aitkenhead et al., 2023) further underscore the significance of these measures in maintaining economic stability.

7.7 Limitations and Suggestions for Future Research

While our study provides valuable insights, it is essential to acknowledge its limitations. The research primarily relies on historical data, and the predictive capacity of the models may be

influenced by unforeseen global events. Additionally, the study does not account for potential geopolitical factors that may impact oil prices.

Future research endeavors could incorporate real-time data and consider a broader spectrum of variables, including geopolitical factors and technological advancements in the energy sector. A longitudinal study tracking the implementation and effectiveness of policy recommendations would also contribute to a deeper understanding of Oman's economic dynamics.

In conclusion, our research contributes to the ongoing discourse on the economic challenges faced by oil-dependent nations and provides actionable policy recommendations to enhance Oman's economic resilience. As the nation charts its course towards sustained development, strategic and adaptive policymaking will play a pivotal role in navigating the complex terrain of global oil markets.

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