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Revisiting the Curse of Natural Resources: Evidence from the Oil-Producing Countries

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ABSTRACT

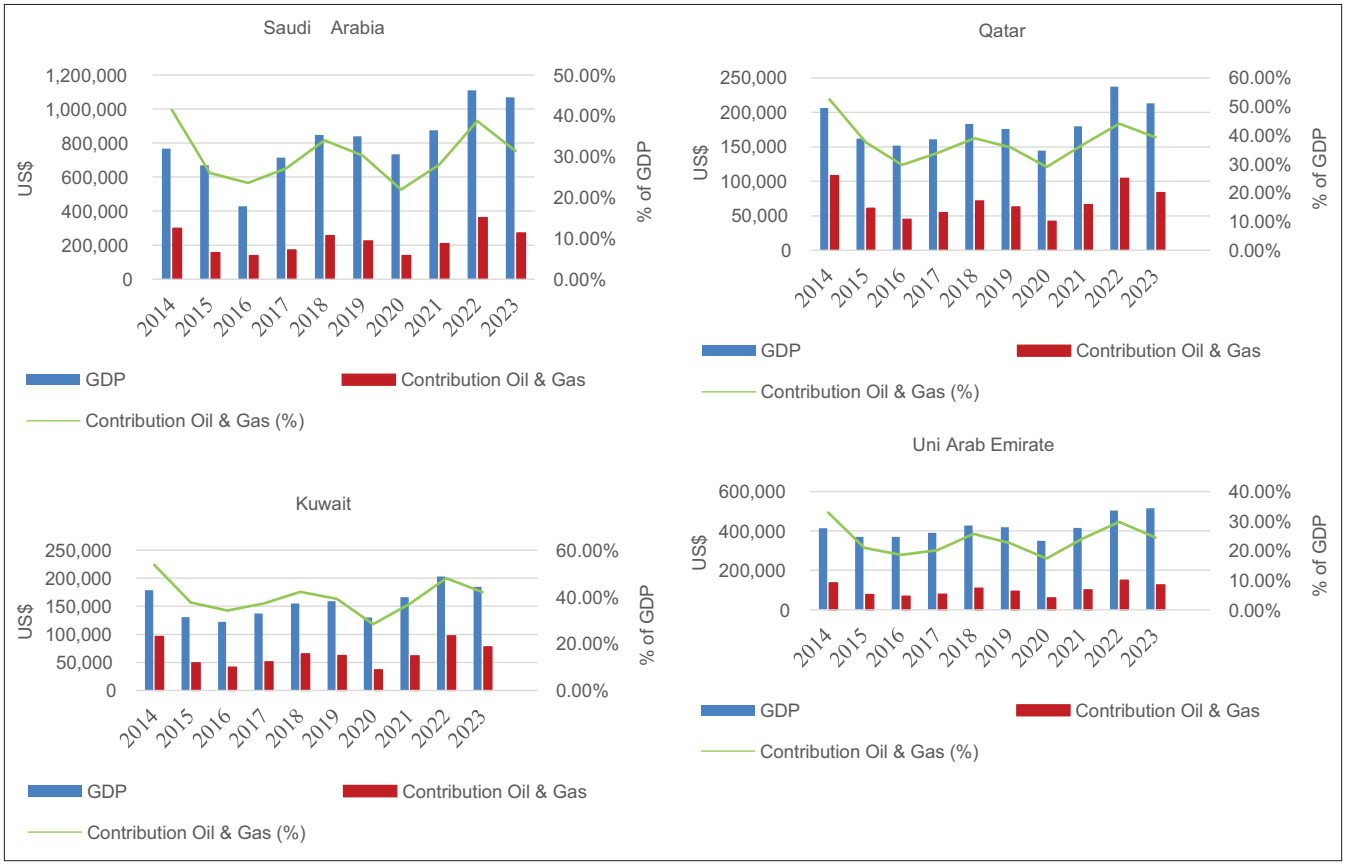
The phenomenon of resource curse refers to the effect of the availability of a region in its natural resources. This is a special concern for oil-producing countries. The paradox of the resource curse indicates that countries with abundant natural resources are experiencing conditions of sluggish economic growth, social inequality and political instability. This study aims to analyze the dynamic relationship between oil production, the amount of oil reserves, and oil prices to GDP. The researcher analyzed in the short and long term the 4 largest oil-producing countries in the Middle East region, namely Qatar, Saudi Arabia, the United Arab Emirates, and Kuwait. Empirically, the time series data used covers the years 2013-2023 using the VECM Panel method. The results of the estimate show that there is no causal relationship, only the variable of oil reserves affects economic growth. Based on the Impulse Response Function (IRF), it shows that economic growth responds to shocks that occur on itself or two other variables, namely experiencing fluctuations at the beginning of the period and reaching equilibrium points in different periods. The results of the Variance Decomposition (VD) contribution show that oil production has a negative relationship with economic growth. The long-term results of PVECM found that oil reserves (CM) and oil production (PM) in lag 1 did not have a significant influence on economic growth. As well as the short-term results of PVECM that oil reserves (CM) have a significant influence on economic growth, while oil production (PM) does not have a significant influence in the short term. This discovery provides an interesting picture of the dynamics of natural resources, especially oil, in relation to economic growth.

Keyword: Economics Growth, Natural Resource, Oil Price, Oil Producing, Oil-Producing Countries, Oil Reserves
JEL Classifications: Q32, Q33, O13, F43

1. INTRODUCTION

In 1932, the Awali area in Bahrain became the forerunner of the discovery of the first commercial oil wells which marked the beginning of the era of petroleum exploitation in the Gulf countries and the transformation from a fishery-based country to an oil-producing country (Yergin, 1991). Over time, the oil sector became a major contributor contributing to GDP. For example, Qatar in the 1970s had relied on the oil sector after the discovery of large natural gas fields in the North Fork (Ibrahim and Harrigan, 2022). It was followed by Kuwait in the same period, where more than 80% of the country's revenue came from the oil and gas sector (El-erian, 1997). The discovery of oil can also increase labor demand and attract new activities, thus causing an agglomeration effect that has a positive impact on productivity and income (Michaels, 2011). The availability of oil reserves greatly affects the quantity of production and the volatility of oil prices (Cavalcanti et al., 2016). Thus, oil reserves and discoveries provide a significant contribution to economic growth. Figure 1 presents the contribution of the oil and gas sector to the GDP of Saudi Arabia, Qatar, Kuwait, and the United Arab Emirates in 2007-2017. The trend of the contribution of the oil and gas sector to the GDP of the four countries tends to increase from 2007 to 2014. However, since 2015 there has been a significant decline in the percentage of oil and gas to GDP, which shows that the countries of Saudi Arabia, Qatar, Kuwait, and the

Figure 1: Contribution of the oil sector to GDP in 2014-2023



Sumber: Gulf Investment Corporation (2024)

United Arab Emirates have begun to loosen their dependence on the oil and gas sector.

GDP is often used as a key indicator of a country's economic strength. Oil-rich areas have higher population growth, higher per capita incomes, and better infrastructure (Michaels, 2011; Suleimenova et al., 2020). Jassim (2021) explained that there is a positive contribution between oil production to economic growth. In fact, the level of oil production has a positive effect on economic growth both in the long term and in the short term (Hafsi et al., 2021). The abundance of natural resources also has a positive effect on economic growth in the oil-exporting countries of the Eurasian region (Bildirici and Kayikçi, 2013). Oil production and economic growth are interintegrated in the country through a positive two-way causality relationship between oil production and economic growth.

On the other hand, although the GDP level is high, it is not always accompanied by equitable social welfare. This phenomenon is also often seen in the economic dynamics of oil-producing countries which actually experience delays in economic diversification, high inequality between rich and poor, and strengthening political institutions (Dodd, 2005; Frankel, 2010). Wealth derived from oil can indeed increase income, but over-reliance on one sector alone can lead to various economic, social, and political problems in the long run. This phenomenon is known as the resource curse. The phenomenon of natural resource curse states that countries with abundant natural resources tend to experience economic stagnation, political instability, and low levels of development (Auty, 1993). This phenomenon is also known as the paradox of plenty (Sachs and Warner, 1995). The resource paradox shows that abundant natural resources can actually hinder economic growth and increase social inequality. Although resource exploitation initially increases economic prosperity in the short term, long-term dependence will lead to resource depletion, environmental damage and economic stagnation. Thus, over-reliance on oil can hinder economic diversification and can create social problems (Mehlum et al., 2006; Wang and Li, 2025; Xiao et al., 2025).

In the global economy, oil prices, exchange rates, and the stock market are interrelated. Maheu et al. (2020) stated that in emerging markets, oil prices are very sensitive to oil price volatility as the main oil exporter or importer (Chen et al., 2024; Li and Du, 2024). Oil as a form of non-renewable energy and as an energy source that is still widely used in economic activities. Oil has accounted for about 33% of global primary energy consumption and 94% of the energy used in the transportation sector (van Eyden et al., 2019). Oil prices in the world use USD per barrel (1 barrel is approximately around 159 L) and the price of the United States dollar greatly affects changes in international oil prices (De Schryder and Peersman, 2015). Oil price shocks have a negative impact on the economy which triggers high inflation rates (Chen, 2021; Deyshappriya et al., 2023; Osintseva, 2022). So the risk of global oil price uncertainty can trigger concerns and growth workloads in oil-dependent countries. Economic diversification

and appropriate policy making can help soak in the event of a change in oil prices.

Some of the phenomena or research gaps described are of interest for further research, especially regarding the pattern of relationship between oil production and the amount of oil reserves on economic growth. The purpose of this study is to examine and analyze the dynamic relationship between oil production and the amount of oil reserves on economic growth in the short and long term for panel data of the 4 largest oil-producing countries in the Middle East region from 2013 to 2023. This research is important because it will provide deeper insight into the curse of natural resources in oil-dependent countries. The results of this study can provide policy recommendations for these countries to reduce dependence on oil, improve governance, and improve social welfare through more effective economic diversification policies. Thus, this research not only contributes to the economic literature, but can also have a positive impact on policy development in countries caught in the curse of natural resources.

2. LITERATURE REVIEW

2.1. Resource Curse Theory

Based on the theory of the "curse of natural resources" or Resource Curse, countries with abundant natural resources often experience various economic and social problems. This is contrary to the assumption that having abundant natural resources will contribute to domestic economic prosperity. Sachs and Warner (1995) found that countries rich in natural resources tend to have lower economic growth, higher levels of corruption, and greater political instability compared to countries that are less dependent on natural resources. This is due to a variety of factors, including a lack of economic diversification, a reliance on the oil sector that is prone to price fluctuations, and poor management of natural resources.

Countries that have abundant natural resources tend to fall into the term "stack trap" (Auty, 2001). These countries depend on the export of primary products for a long time. This dependence can certainly hinder industrialization, which in turn leads to unstable economic growth and a lack of adaptability to global market changes. Flexible and responsive industry policies to global market conditions are important for sustainable economic growth (Auty, 1994).

In addition, although oil-rich countries often have high GDP per capita, people's happiness and social well-being do not always increase. This shows the paradox of plenty, in which although the country is rich in natural resources, social problems such as economic inequality and social injustice are increasing (Arezki et al., 2011). Studies of petrodollar countries state that economic stagnation or even economic downturn can occur in this group of countries (Sachs and Warner, 1995). So that the dependency of natural resources can create significant challenges to economic growth and social stability for countries rich in natural resources.

2.2. Oil Production in the Middle East

The Middle East is a friend with the largest amount of oil reserves in the world. Countries such as Saudi Arabia, Iraq, Iran, and Kuwait are major oil producers. The global impact provided by the group of oil-producing countries has affected world oil prices and increased incomes of other oil-producing countries. The eastern region is already the center of world energy production, in 2018 around 836 Gbbl of oil which is almost half of the world's reserves (Picard, 2020). Oil production is not only the main driving force in the economies of these countries but also a source of foreign exchange and financing for national development projects. This large oil production also brings a number of challenges, especially related to changes in international oil prices. Yergin (1991) stated that excessive dependence on the oil sector can lead to political instability if there is a decline in oil prices, affecting the country's income and investment.

2.3. Economic Growth

Economic growth is an increase in the production of goods and services as well as income that can be measured through the value of the gross domestic product (GDP). Mankiw (2007) explained that economic growth is the market value of all final goods and services that have been produced by a country. Economic growth theory emphasizes factors that can affect the rate of economic growth in a country. Solow's (1956) theory of growth explains that economic growth is determined by the accumulation of physical capital, labor growth and technological advancement. Natural resources and factors of production can increase output in the short term. In the long term, technology and capital accumulation play a greater role in determining the rate of economic growth. In contrast to the endogenous growth theory, which argues that economic growth can be influenced by government policies and other internal factors such as innovation and investment in human capital. Romer (1990) explained that knowledge and innovation are the main keys to sustainable economic growth. In other parts of countries that depend on natural resources, such as petrodollar countries, prone to facing the problems mentioned in the theory of natural resource curse, dependence on oil and gas exports can hinder economic diversification and exacerbate social and political inequality.

2.4. Research Hypothesis

2.4.1. Oil production

Oil production has contributed directly to economic growth through increasing incomes and creating job opportunities. This positive relationship is in line with the theory of economic growth and previous literature that the energy sector plays a role as the economic driver of the petrodollar country. Hafsi et al. (2021) show that petroleum production has a significant positive impact on economic growth both in the long and short term and there is a causal relationship between oil production and economic growth. The same results were also obtained by Bildirici and Kayikçi (2013) who examined the impact of oil production on economic growth in the Eurasian oil-exporting region. Oil production has also been found to have long-term and short-term positive effects on economies in OPEC countries, although only in the short term can a causal relationship between these two variables be found (Yuzbashkandi & Mehrdad, 2020)

H_1: Oil production has a significant positive influence on the economic growth of the petrodollar country in the long and short term

2.4.2. Oil reserves

It is important to consider policies to manage oil reserves as it can reduce fluctuations in price increases that will affect economic growth (Yang et al., 2022). Oil reserves can be a buffer to reduce the impact of fluctuations in global oil prices, which are often volatile. With wise management, the country can mitigate the negative impact and sudden increase in oil prices. In addition, the discovery of oil can significantly increase GDP per capita and urbanization (Cavalcanti et al., 2016). The right money policy in the management of oil reserves not only helps reduce economic risks in the short term but opens up opportunities for more inclusive and sustainable economic development

H_2: Oil reserves in the long and short term are significant positive for economic growth

3. METHODOLOGY AND DATA

3.1. Data and Variable Measurement

The study uses a combination of cross-sectional and time-series data, known as Panel data which combines panel datasets from 4 countries in the middle east region which include, Saudi Arabia, the United Arab Emirates, Qatar, and Kuwait during the period 2013-2023. Empirical analysis of the relationship between economic growth, oil production, and oil reserves. This study uses secondary data, taken from The Global Economy, the US Energy Information Administration, and the World Bank.

3.2. Panel Unit Root Test

One of the key benefits of using a panel unit root test in panel data is that it provides more observations to increase data variability and information, allowing more efficient estimates to be generated. The root panel unit test was used to check the degree of integration between the study variables and the stationary properties of all the variables used. To explore the degree of integration between variables, the study used different tests from the root of the panel units, including Levin, Lin and Chu (LLC), Augmented Dickey-Fuller (ADF)-Fisher and Philips Perron (PP)-Fisher testing (Amaluddin, 2020). Root testing of panel units that rely on cross-sectional independence uses this approach as the most relevant reference. LLC (2002) developed a panel-based proposition based on ADF tests that examined the existence of homogeneity in autoregressive coefficient dynamics. The root test of the data unit of the LLC (2002) panel in Baltagi (2005) used the following ADF specifications:

$$DY_{it} = \alpha Y_{it-1} + \sum_{j=1}^{p} \beta DY_{it-j} + x_{it}\delta + \varepsilon_{it} \quad (1)$$

Where Y_{it} = panel data DY_{it} = difference form of Y_{it} α = p – 1 P_i = number of lags adjusted for first difference ε_{it} = error term.

Im, Pesar, and Shin (IPS) developed a root test of a panel data unit that combines a time series data dimension with a cross-sectional dimension. It has a powerful property for investigating the root of panel units and is very useful for economists to analyze long-term relationships in panel data. In its development, IPS needs to be combined with other root test units to get accurate and precise results.

3.3. Panel Cointegration Test

The cointegration test was used to determine the existence of long-term relationships between variables using stationary data. All variables used by GDP and oil production must be in the same order or integrated at the same level to meet the requirements of PVECM (Amaluddin, 2020). To explore the existence of co-integration between variables, this study uses different panel cointegration tests, including the Pedroni and Kao Tests. Kao (1999) considers homogeneous cointegration vectors, while Pedroni (2004) allows for some heterogeneity. However, both relied on the cross-sectional independence of the panel units to obtain asymptotic normality for their test statistics. Pedroni in Neal (2014) allows for some heterogeneity in cointegration relationships. He proposed seven robust statistical tests namely the ADF-statistical parametric panel, the PP-Statistics non-parametric panel, the rho panel, and the v-statistics panel are the four statistics in the dimension, while the ADF-Statistics group, the PP-Statistics group, and the rho-Statistics panel group are the three between the dimensional statistics.

$$Y_{it} = a_i + \delta_{it} + \beta_{1it} x_{1it} + \cdots + \beta_{Mit} x_{mit} + e_{it} \quad (2)$$

$$\Delta Y_{it} = \Delta\beta_{1it} x_{1it} + \cdots + \beta_{Mit} x_{Mit} + e_{it} + \eta_{it} \quad (3)$$

$$\hat{e}_{it} = \hat{y}_{1it} \hat{e}_{it-1} \hat{u}_{it} \quad (4)$$

$$\hat{e}_{it-1} = \hat{y}_{1it} \hat{e}_{it-1} + \sum_{k=1}^{k} y_{ik} \Delta\hat{e}_{it-k} + \hat{u}_{it} \quad (5)$$

Under the zero no-cointegration hypothesis, Kao (1999) in Baltagi (2005) suggested a robust new cointegration test. The ADF panel cointegration test is assumed to be homogeneous. One of the two tests is based on the DickeyFuller type test (DF), and the other on the ADF. The panel regression specification of estimated residual (e_{it}):

$$y_{it} = a_i + \beta x_{it} + \varepsilon_{it} \quad (6)$$

The Kao test is based on the residual ADF version (εit) of the additional regression εit = ρεit −1 + vit, or on a modified version of the collected specification can be written as:

$$\varepsilon_{\text{it}} = p\varepsilon_{\text{it}-1} + \sum_{j=1}^{p} \lambda_{\text{J}} \Delta\varepsilon_{\text{it}-\text{j}} + \text{v}_{it} \quad (7)$$

In the previous equation, the ADF test statistics are standard t-statistics. The zero no-cointegration hypothesis on ADF test statistics is written as follows:

$$\text{ADF} = \frac{t_{ADF} + \left(\frac{\sqrt{6N\hat{\sigma}V}}{2\sigma 0V}\right)}{\sqrt{\left(\frac{\hat{\sigma}_{0v}^2}{2\hat{\sigma}_v^2}\right) + (10\hat{\sigma}_{0v}^2)}} \quad (8)$$

Where: $\hat{\sigma}_v^2 = \Sigma\mu\varepsilon - \Sigma\mu\varepsilon\sum_{\varepsilon}^{1}\hat{\sigma}_v^2 = \Omega\mu\varepsilon - \Omega\mu\varepsilon\Omega_{\varepsilon}^{1}\Omega$ is a long-term covariance matrix, and tADF is an ADF t-statistic. Statistics t of the Kao panel data cointegration test (ADF) compared

with the Probability value of the t-statistic. When the statistical value exceeds the critical value or probability value <0.05, the null hypothesis is rejected which indicates the existence of cointegration.

3.4. PVECM

Based on the objectives of this study, PVECM was used to investigate the short-term and long-term relationship between three variables, namely oil production, oil reserves, and economic growth. In the PVECM method, there are several pre-estimation tests before the main estimate. PVECM is one of the quantitative methods that was widely used in previous research (Amaluddin, 2020). The VECM method was first popularized by Engle and Granger to correct short-term imbalances to long-term relationships. The main requirement in PVECM that distinguishes it from PVAR or ARDL is that in PVECM it must be integrated in the same level or sequence also taking into account the existence of cointegration that has implications for the correction of short-term imbalances, allowing for a long-term equilibrium or relationship.

Determination of cointegration vectors (cointegration vectors) indicates the presence of long-term behavior and allows to capture causal relationships (Ekananda, 2019; Gujarati & Porter, 2009; Rachev et al., 2007). The PVECM treats the three variables used (Economic growth, oil production, and oil reserves) as endogenous variables involving the lag value of each variable and ECT on the right side of the equation. The specifications of the VECM Panel model can be written as follows:

$$\Delta PE_{\text{it}} = \alpha_1 + \sum_{i=1}^{p} \beta_1 \text{PM}_{it-1} + \sum_{i=1}^{p} \beta_2 \text{CM}_{it-1} \quad (9)$$

4. EMPIRICAL RESULTS

This study uses vector error correction model (VECM) analysis to see the relationship between economic growth, oil reserves, and oil production. VECM analysis as a type of inference analysis method, begins with conducting a unit root test (unit root test), which aims to see whether the data used is stationary or not, and where the level is stationary (level, first difference or second difference). This is because one of the requirements for implementing VECM analysis is that the data used must be stationary. The processing results as shown in Table 1, show that the statistical value of the unit root test is <0.05 so that it can be concluded that the data has a unit root (stationary) at the level. So that there is no need for more testing at the level of first difference and second difference.

4.1. Stationary Test

Data processing begins by conducting a stationary test. The Stationarity test in VECM is essential to ensure the validity of the model and avoid false regression by verifying that the stationary time series data are at the same level of differentiation, usually the first differentiation, so that the results of the analysis obtained are accurate and reliable. The results of the stationery test in this study are presented in Table 1.

A variable can be said to be stationary if the P < 0.05. Based on Table 1, it is known that the stationary variable at the level has a P-value value of economic growth of 0.0022, oil reserves of 0.0109, and oil production of 0.0241.

4.2. Cointegration Test

The cointegration test is carried out to determine the analysis method to be used. If there is cointegration, VECM analysis will be used, whereas if otherwise, VAR analysis will be used. Based on the results of the Pedroni cointegration test processing presented in Table 2, it is concluded that there is cointegration at the alpha level of 1%. The existence of cointegration is also consistently demonstrated by the Kao cointegration test, with a significant t-statistical value at a significance level of 5%, so that the analysis can be continued with the VECM method.

4.3. Engle Granger's Causality Test

The results of the Granger causality test processing as shown in the Table 3, show that there are variables that have a causal relationship. This is indicated by all P-values that are <0.05. Then, the VECM analysis was continued by looking at the IRF graph as shown in Figure 2.

The results of the processing in the form of 9 IRF graphs as shown above provide a visual overview of the next 10 (ten) periods related to the response of a variable that arises due to a shock of 1 (one) standard deviation, either from itself or from other variables. Based on Figure 2, the response of economic growth to shocks that occur on itself or two other variables is to fluctuate at the beginning of the period and reach equilibrium points in different periods. The response of oil reserves and oil production to economic growth

Table 1: Stationary test results

Variable	Level	First difference	Second difference
Economic growth	0.0022	-	-
Oil reserves	0.0109	-	-
Oil production	0.0241	0.0003	

Source: Author, 2025 (data processed)

Table 2: Pedroni cointegration test

Indicator	t-statistic	Probability
Within-dimension		
Panel v-statistic	-0.610212	0.7291
Panel rho-statistic	0.0400460	0.6556
Panel PP-statistic	-6.068542	0.0000
Panel ADF-statistic	-2.886025	0.0000
Between-dimension		
Group rho-statistic	1.408662	0.9205
Group PP-statistic	-7.296026	0.0000
Group ADF-statistic	-3.024194	0.0012
Kao residual cointegration test		
Indicator	t-statistic	Probability
ADF	2.010122	0.0222

Table 3: Engle granger causality test results

Variable	F. statistic	Prob.
PE to CM	1.75252	0.2070
CM to PE	5.12157	0.0202
PM to CM	0.84818	0.4477
CM to PM	0.58470	0.5695
PM to PE	1.04170	0.3677
PE to PM	3.40275	0.0493

Source: Author, 2025 (data processed)

Figure 2: Graph of impulse response function analysis results

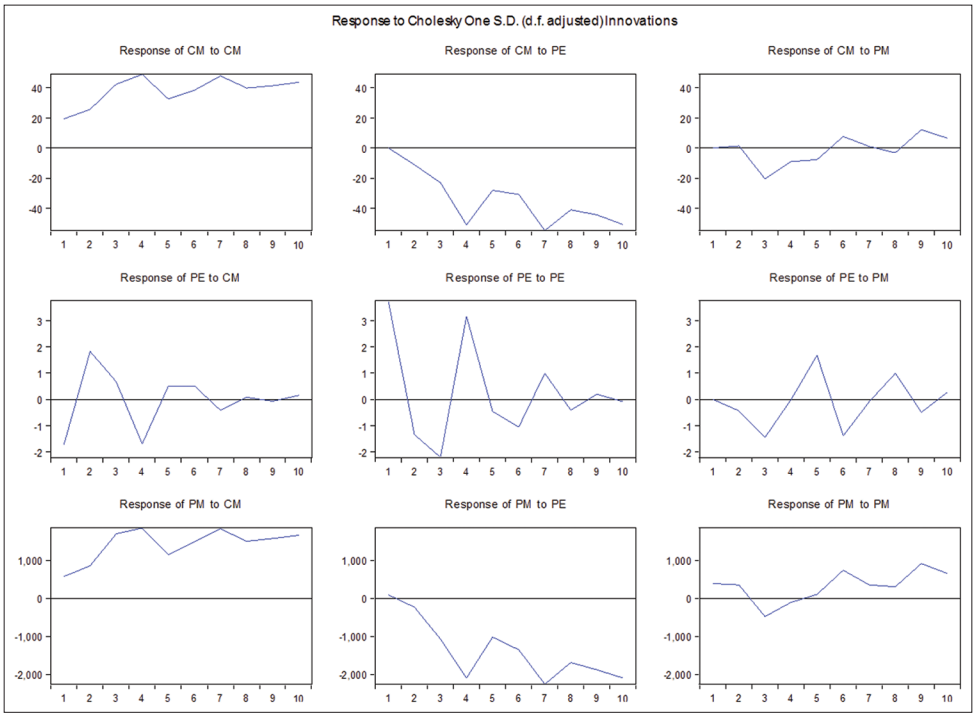


Table 4: Short-term PVECM results

Variable	Coefficient	t-Statistics	Information
To : D (PE)			
ECT(−1)	−2.72	-5.65	Significant
D (CM[−1])	0.05	1.54	Significant
D (PM[−1])	−0.00	-0.13	Insignificant
C	2.41	2.589	
R-squared	0.821334		
Adj. R-squared	0.682372		
F-statistic	5.910483		

Source: Author, 2025 (data processed)

will experience a very declining condition in the 10th period.

4.4. Estimated Panel Vector Error Correction Model (PVECM)

Based on the short-term VECM estimate in Table 4, it is known that in the short term, oil reserves and oil production have a significant influence with a statistical t-value of −5.65 on economic growth. Meanwhile, the variable oil reserves in the short term has a positive effect on economic growth with a coefficient value of 0.05 and a statistical t of 1.54, meaning that when oil reserves increase by 1 barrel, economic growth will increase by 0.05% assuming that ceteris paribus or other variables are constant. While in the explanation of the natural resource curse theory, it is stated that although countries are rich in natural resources, especially oil, they often have difficulties in achieving sustainable economic growth. This can be caused by several factors such as excessive dependence on the extractive sector, volatility in commodity prices, economic instability, and weak institutions and poor governance. In the short term, the supply of petroleum is an input in the production process of human life. When petroleum reserves are unstable, it will cause output in a country's economy to be disrupted. Salvatore (2021) in his research on oil-producing countries shows that although oil production can have a positive influence in the short term, it is not enough to drive sustainable economic growth. This research emphasizes the importance of diversifying economic sectors so that countries can reduce dependence on extractive sectors and avoid economic instability caused by oil price fluctuations.

The variable oil production in the short term is not significant, namely with a coefficient value of −0.0 and a statistical t result of −0.13. This means that fluctuations in oil production variables do not have a significant effect on economic growth. Oil production variables in the short term are not significant to economic growth, meaning that fluctuations in oil production variables do not affect economic growth in this study. Countries have made efforts to reduce dependence on oil by diversifying their economies in other sectors. Economic diversification efforts are now directed at the development of the agricultural, service, and manufacturing sectors (IMF, 2016; Kabbani and Mimoune, 2021). These sectors have now played a major role in economic growth. This form of diversification also makes fluctuations in oil production have little impact on overall economic growth. In addition, the impact of oil production fluctuations may not be very visible in the short term because changes in energy investment or effects on the production sector often take time to be seen, so in the short term the influence of oil production does not provide significant results. Other factors that can affect these results may be due to government policies, global factors, and changes in economic structure (Alyasegh, 2023; Hassen, 2022; Olabisi and Adewale, 2020; Qudah et al., 2016).

Based on the results of the long-term VECM estimate in Table 5, it shows that the CM and PM variables at lag 1 do not have a significant influence on economic growth. This is not in line with the research of Supriyanto et al. (2021) which looks at world oil

prices to economic growth in Indonesia. This is in line with the Resource Curse Theory, which argues that even though the country has a lot of natural resources, such as oil, this can actually cause economic, social, and political problems. Countries with rich natural resources tend to face problems such as dependence on extractive sectors, fluctuations in commodity prices, economic instability, corruption, and poor governance, all of which can hinder long-term economic growth. The relationship between natural resources and economic growth has been controversial, especially in low-income but resource-dependent countries. This is in accordance with the research of Xiao et al. (2025) which looked at the Belt and Road Initiative (BRI) with resource-rich areas tending to experience slower economic growth compared to resource-scarce areas.

The results of the long-term oil reserve estimate tested at lag 1 did not provide significant response results with a coefficient value of 0.00 and a statistical value of 0.43 indicating insignificant results. The oil deficit has occurred since 2003 due to the response to increasing needs to support economic activities ranging from production, transportation to industry. The insignificant oil reserves (CM) in the long term indicate that although Arab countries have oil reserves, their influence on economic growth is not strong enough. The influence can occur due to the dependence of Saudi Arabia, Qatar, Kuwait, the United Arab Emirates on the oil and energy sectors, which have become greater over time. The long-term PM estimate yields a coefficient value of −0.00 and a statistical t-value of −1.0, meaning that the results are insignificant. The shift in petroleum stocks and production from OPEC countries is very volatile in the global oil market (IEA). However, historical evidence shows that oil price shocks can disrupt the labor market in oil-exporting countries (Das et al., 2024). Previous research, such as that conducted by Alssadek & Benhin (2021), Isachsen & Gylfason (2022), Salvatore (2021) added that oil-rich countries often experience a decline in long-term economic growth because dependence on the energy sector reduces incentives for innovation and development of the non-energy sector. Fluctuations in oil production, while they can have a momentary impact, are not able to compensate for the decline in institutional quality and economic imbalances in the long run.

Table 5: Long-term PVECM results

Variable	Coefficient	t-statistics	Information
CM(−1)	0.00	0.43	Insignificant
PM(−1)	−0.00	−1.0	Insignificant
C	1.23		

Source: Author, 2025 (data processed)

Table 6. Variance Decomposition Result

To:PE	S.E.	CM	PE	PM
Period				
1	4.102653	17.15844	82.84156	0.000000
2	4.709488	28.12795	71.01024	0.861815
3	5.438790	22.64140	69.61725	7.741356
4	6.518203	22.54811	72.06179	5.390109
5	6.763993	21.47465	67.37297	11.15237
6	7.002968	20.56504	65.11862	14.31634
7	7.085680	20.43265	65.56692	14.00043
8	7.166722	19.98668	64.42131	15.59201
9	7.186600	19.88460	64.13793	15.97748
10	7.193604	19.88919	64.02528	16.08553

Source: Author, 2025 (data processed)

4.5. Analysis Variance Decomposition

The variance decomposition step aims to measure how much the influence of independent variables contributes to dependent variables. The results are presented through graphs as well as tables.

The next analysis is to look at the forecast error variance decomposition (FEVD), as shown in Table 6. Table 6 shows the FEVD values over 10 periods for the oil reserve variables. If you look at it in the short term, for example in the 3rd period, it can be seen that the shock that occurred on itself caused 69.61% with each oil reserve contributing to economic growth of 22.64% and oil production contributing 7.74% to economic growth. However, if viewed in the long term, for example in the 10th period, the fluctuations caused by the shock of economic growth itself gradually decreased (64.02%), with oil production contributing 16.08% and oil reserves contributing 19.88%.

5. DISCUSSION

The availability of oil reserves is a potential natural resource owned by a region. Based on the results of the short-term VECM estimate, it was found that oil reserves (CM) have a significant influence on economic growth. This discovery provides an interesting overview of the dynamics of natural resources, especially oil and its relationship with economic growth. Increased oil reserves provide potential for short-term economic growth as it increases state revenue and ensures the availability of qualified energy for industrial sectors. In addition, the availability of oil reserves will affect the perspective of investors and market participants regarding economic stability. Optimism about the availability of oil will encourage domestic and foreign investment which in turn will encourage economic growth. Market participants, especially financial markets, will respond to the availability of oil reserves through exchange rates, interest rates, or other forms of economic indicators (Mohammed et al., 2020). Furthermore, oil production as a realization of the potential availability of oil does not have a significant influence in the short term. Oil production can be influenced by weather factors, technical conditions, and also management decisions that may not be directly related to energy growth. The short time span allows the impact of oil production to be more focused on the energy sector than on economic growth.

It is different with the existence of the oil and gas sector in the long term to the economy of a country. In the long run, the economic structure of a country will certainly undergo changes. These changes can be in the form of economic diversification or a change in the focus of the economy from the energy sector to other sectors, Behind the benefits obtained from the availability of oil reserves in the short term, high dependence on natural resources (especially oil) in the long term will lead to economic instability due to fluctuations in oil prices and problems related to the management of the energy sector. This shows that the wealth of natural resources is not always directly proportional to long-term economic growth. As the result of the long-term VECM estimate, oil reserves (CM) and oil production (PM) at lag 1 do not have a significant influence on economic growth. Oil reserves and oil

production remain important components of the economy, but their influence on economic growth is not very dominant. The effects of changes in oil reserves and production will be diffuse in the form of complex transmissions and will take a long time to contribute to economic growth. Moreover, the intervention from the government related to energy management (Riswan et al., 2018), technological changes, and global demand for energy will certainly provide a different relationship between the oil sector and economic growth. Moreover, government intervention related to energy management (Kimiagari et al., 2023), technological changes, and global demand for energy will certainly provide a different relationship between the oil sector and economic growth. Currently, many countries are competing to implement sustainable development-based things that pay close attention to the environment. A decrease in energy demand related to climate change. Application of environmentally friendly technology. This will certainly change the role of the oil and gas sector in the economy.

One explanation for this finding can be attributed to the natural resource curse theory which posits that although countries are rich in natural resources such as oil, they often experience stunted economic growth or even economic setbacks in the long term. The natural resource curse theory suggests that natural resource-producing countries can reduce their over-reliance on extractive sectors such as oil. In the context of oil reserves in the short term it will show the potential for increased energy supply, which could give a temporary boost to energy-dependent sectors. However, fluctuating oil production and dependence on oil in the economy in the long run will hinder the development of other sectors, such as manufacturing, technology, or services. This is an indication of the curse of natural resources, where despite significant oil reserves, the country remains trapped in dependence on the extractive sector. Some oil-producing countries face similar challenges when it comes to dependence on oil. Although these countries have abundant oil reserves, they also face various economic challenges due to their high dependence on the energy sector. Currently oil-producing countries such as Saudi Arabia and Qatar have begun to develop strategies to diversify their economies, focusing on non-energy sectors such as technology, tourism, and manufacturing. However, the diversification process takes time, and fluctuations in global oil prices still have a major impact on economic growth. This shows that although these countries have abundant natural resources, their long-term economic growth remains hampered by dependence on the oil sector. Countries that can escape the resource curse can be seen from the development of industry.

6. CONCLUSION

Based on the results of the VECM Panel analysis, it shows that there is no weight-back relationship tested through the Granger causality test, but the oil reserve variable has an effect on economic growth. The results of the IRF estimate test the response of economic growth to shocks on its own or to two other variables show fluctuating shock results in the initial period, until it reaches a different equilibrium point. The response of oil reserves and oil production to growth is experiencing a shock that tends to decline. The result of the contribution of variance decomposition (VD) oil production to economic growth has a negative relationship, meaning that when oil production decreases, the shock of economic growth increases. In the measure of long-term PVECM results, oil reserves and oil production do not provide significance to economic growth if viewed from the short-term PVECM results, there are significant effects on economic growth, especially oil reserves, but on the other hand, oil production does not have a significant influence on growth.

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