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Diversification, Oil Prices, and Economic Resilience: A Dynamic Panel Analysis of Gulf Economies

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Abstract

This study investigates the role of economic diversification in shaping economic growth dynamics within oil-dependent Gulf Cooperation Council economies over the period 2000 to 2024. Recognising the structural vulnerabilities associated with heavy reliance on hydrocarbon revenues, the analysis develops a Composite Economic Diversification Index that captures export, sectoral, and fiscal diversification dimensions. A dynamic panel framework is employed, incorporating second-generation unit root and cointegration techniques to address cross-sectional dependence and ensure robust inference. The empirical estimation is conducted using the pooled mean group autoregressive distributed lag approach, complemented by fixed effects error correction models with Driscoll–Kraay standard errors to validate robustness. The findings indicate that diversification plays a critical role in enhancing long-term economic performance by promoting structural balance and reducing exposure to external shocks. While the long-run contribution of diversification is substantial, short-run effects remain limited, reflecting transitional frictions and adjustment processes. Investment exhibits mixed effects, contributing positively in the short term but displaying inefficiencies over longer horizons. Labour force participation does not emerge as a key determinant of growth, suggesting that productivity and skill composition are more relevant than labour quantity. Oil prices continue to exert a significant influence on economic performance, underscoring the persistent dependence on resource revenues despite ongoing diversification efforts. The results provide important insights for policymakers seeking to balance resource-based revenues with long-term economic resilience.

Keywords: Economic Diversification, Economic Growth, Oil Dependence, GCC Economies

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1. INTRODUCTION

In resource-dependent economies, the availability and exploitation of natural resources have long been determinants of the economy's economic growth, especially in oil-rich economies. Although resource abundance can yield significant revenues and fiscal space, it also brings structural vulnerabilities due to price volatility and external shocks, in addition to limited sectoral diversification (Nurunnabi, 2017; Ertimi et al., 2021; Adom, 2023). The oil-based economies, particularly in the GCC states, have long depended on oil revenues for their economy, public spending and investment (Khorsheed, 2015; Razzak, 2022; Roussel & Audi, 2024; Abdelkawy, 2024). The structural transformation theory gives a conceptual basis to understand the importance of diversification in economic development. This theory focuses on the shift of economic activity away from low-productivity activities, like primary resource extraction, to high-productivity activities, like manufacturing and services. This kind of change increases productivity, promotes technological diffusion and contributes to long-term economic growth. Diversification is not only a development goal but a necessity in oil-dependent economies in order to decrease reliance on variable resource revenues and ensure balanced growth (Mensi et al., 2018; Audi & Ali, 2022; Ateba & Enwereji, 2024; Al-Kuwari, 2025). Resilience and sustainable growth in resource-rich economies are thus directly connected to the transition to more diversified economic structures.

The resource curse theory, however, provides a counterpoint to the positive economic development effects of natural resource abundance by proposing that the latter can actually be a detriment to the economy. This theory holds that

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excessive resource revenue dependence can stimulate rent-seeking activities, poor institutional development and crowding out of the productive sectors like manufacturing and services. The impacts may hinder economic diversification and affect the long-term growth potential. Oil domination can lead to fiscal dependence, appreciation of exchange rates, and lower competitiveness of the non-oil sector, which can exacerbate structural imbalances (Gelb et al., 2002; Yaqub, 2019; Marc et al., 2022; Jafari & Faghihi, 2024). The abovementioned issues put emphasis on diversification as a tool to reduce the drawbacks of resource dependence. This is complemented by endogenous growth theory, which highlights the importance of domestic inputs, including investment, human capital, and technological innovation, to the process of long-term economic growth. In this context, diversification can help to manage resources more efficiently, drive innovation and stimulate productivity growth in various sectors. Capital accumulation (investment in infrastructure and productive capacity) and utilisation of human resources (labour force participation) are counted. The impact of these factors, however, is determined by their quality and by their being part of a wider structural reform programme. In resource-rich economies, investment funded by resource rents may not always lead to sustainable growth, unless investment is directed towards productive and diversified (sustainable) sectors (Marc et al., 2023; Zheng et al., 2023; Audi & Al-Masri, 2024; Ross & Werker, 2024). This highlights the need to connect diversification policy with effective investment and human capital investments.

Oil prices are a key determinant of economic performance in the economies of the Gulf Cooperation Council (GCC), both due to opportunities and constraints linked to resource dependence. During the short run, rising oil prices create higher revenues, boost public expenditures, and boost economic growth. The dependence on oil revenues, however, has led to income instability and shocks that endanger long-term stability and slow down the process of diversification. Oil markets are cyclical, which adds uncertainty to fiscal planning and investment decisions, making it hard to maintain steady growth patterns. Additionally, high oil revenues can also lower the incentives to undertake structural reforms, further increasing the reliance on the hydrocarbon sector (El-Katiri, 2013; Tagliapietra, 2019; Marc et al., 2022; Prest, 2022; Helkiah et al., 2025; Marc et al., 2025; Khalid et al., 2025). The dynamics highlighted here show how oil prices can be both a driver and constraint to economic growth. Structural challenges have led the Gulf Cooperation Council (GCC) economies to continue to see the importance of diversification. In the last 20 years, these countries have adopted different economic reforms to boost their non-oil economies, develop the private sector and increase fiscal sustainability. All this has failed to lead to a significant degree of change in the economy, with oil still having a strong influence on economic results. The continued dependence on resources is important for the effectiveness of diversification policies and the economic growth dynamics. It is therefore important to grasp the relationship between diversification, investment, labour force participation and oil prices to create effective policy programmes in those economies (Audi et al., 2021; Zhang & Xi, 2024; Slothuus, 2025; Khan et al., 2025).

The link between natural resource dependence and economic growth, and the role of diversification for sustainable development have been thoroughly studied in the existing literature. Most literature, however, consists of studies of diversification in a single dimension or studies using a static framework of analysis which doesn't capture the dynamics of economic transformation. Furthermore, little has been done in addressing the synergies between sectoral diversification, export diversification and fiscal diversification in a single empirical model and, in particular, in the case of the economies of the Gulf Cooperation Council (GCC). A lack of full diversification measures, as well as a lack of dynamic modelling approaches, is a major drawback in the literature. In this context, the purpose of the current study is to examine the economic diversification's contribution to the economic growth dynamics in the economies of the Gulf Cooperation Council from 2000 to 2024.

2. LITERATURE REVIEW

Economic diversification and the dynamics of oil prices and economic growth have been the subject of much empirical research in the context of resource-dependent economies, especially in the Gulf Cooperation Council countries. There is a considerable amount of literature that focuses on the threat of external shocks, price volatility and structural imbalances to the economy when it is overly dependent on hydrocarbon revenues, which limits future growth potential. For example, Sachs and Warner (2001) have found that growth is less rapid in resource-dependent economies, partly as a result of their volatility and their lack of structural transformation. Similarly, van der Ploeg and Poelhekke (2009) show that fluctuations in commodity prices generate macroeconomic instability, which negatively affects investment and growth. Empirical analysis of oil-exporting economies also shows that high oil dependence raises the susceptibility of the countries to external shocks and reduces their economic resilience (Almutairi et al., 2024; Awolaja et al., 2024; Umair et al., 2025; Apeaning et al., 2025; Arshi et al., 2025).

Economic diversification is a well-established approach to lessen dependence on natural resources and boost economic resilience (Buheji, 2018; Ali & Audi, 2023; Naeem et al., 2025; Mbodj & Laye, 2025). There is empirical evidence that diversification by industry, exports, and fiscal revenues is beneficial for long-term economic growth and that it helps to provide a more stable source of income and develop structural change. Hesse (2008) shows that an increase in export diversification is linked to greater and more stable economic growth, especially in developing countries. Likewise, but in reverse, Lederman and Maloney (2012) offer empirical proof that economies that are diversified can better absorb external shocks and maintain growth. Regarding diversification in the Gulf economies, the studies undertaken by Callen et al. (2014), Cherif et al. (2016) and Hasanov et al. (2018) suggest that diversification has enhanced macroeconomic stability with varying degrees of success among the countries. Empirical evidence suggests that diversification can improve long-term growth, but it may have modest short-term impacts on growth because of adjustment costs and structural rigidities. Oil price dynamics remain an important factor in the performance of oil-rich economies. There is a vast empirical

literature that shows that oil price movements can have important implications for growth, fiscal balance, and macroeconomic stability. From a macro perspective, Hamilton (2009) demonstrates that oil price shocks can have important consequences, especially for oil-exporting nations with highly sensitive revenues to international energy prices. Likewise, Kilian (2008) shows that oil price volatility has a direct impact on the economy on both the supply and demand side. Indeed, despite the efforts towards diversification, the oil price has remained a major factor in determining the performance of the economy in the Gulf context, as evidenced by the research conducted by Mohaddes and Raissi (2017), Nusair (2016), and Alkhateeb et al. (2017). The results indicate that diversification can help to buffer some negative impacts of oil price volatility but has yet to fully decouple economic growth from oil and gas revenues.

Investment is seen as one of the major contributors to economic growth in oil-based economies, but its effectiveness is different at different time horizons. The empirical evidence shows that investments have a positive impact in the short run on growth, by stimulating economic activity and increasing production capacity. For instance, Devarajan et al. (1996) show that public investment can boost growth when it is properly deployed, but with poorly deployed public investments, the growth impact can be small or negative. In the same vein, Arezki and Cherif (2010) demonstrate that high-end countries make suboptimal investment decisions because of governance problems and/or capital misallocation. The impact of investment on growth is also mixed in the Gulf region, with studies by Espinoza and Prasad (2010) and Hasanov et al. (2018) producing conflicting results, depending on the nature of the investments, how they are executed, and institutional quality. The results are consistent with evidence that investment can produce short-term results, but that in the absence of structural reforms, returns diminish over time.

The dynamics that exist between the labour markets and economic growth in resource-based economies are complex and unique, especially in areas where there is high dependence on expatriates and public sector workers. Empirical studies show that labour force participation is not enough for growth; productivity and human capital are more important (Amir et al., 2015; Samusenko & Zimniakova, 2021). However, Gylfason (2001) has found that resource-rich economies tend to be less human-capital intensive and thus have a lower contribution of labour to economic performance. Likewise, Papyrakis and Gerlagh (2004) demonstrate that natural resource reliance can be detrimental to human capital development, which, if continued, may limit growth. Labour markets in the Gulf are also structurally imbalanced, featuring skill mismatches and the use of foreign labour, which limits the contribution of employment to growth, as shown by studies by Hertog (2014) and Imam (2013). The results indicate that increasing labour productivity and skill mix is a more crucial factor than increasing labour numbers.

The notion of economic resilience has been featured in the recent literature, notably in the context of the capacity of the economies to absorb external shocks and sustain stable growth paths. Empirical research points to the importance of diversification for resilience, as it decreases the volatility of revenue from the most sensitive sources and contributes to economic stability. Briguglio et al. (2009) construct an economic resilience framework and demonstrate that diversified economies are more resilient to shocks and more resilient to recovery from downturns. In the same fashion, Joya (2015) identifies that structural diversification will enhance macroeconomic stability and will minimise the likelihood of external shocks. In the Gulf region, the diversification of the economy as a means of coping with climate change risks has been a topic of interest, with some countries making greater progress in diversifying their economies than others, including by investing in non-oil industries such as tourism, finance, and manufacturing. Several recent empirical studies have used sophisticated panel data methods to address the dynamics of diversification, oil prices, and economic growth. The pooled mean group autoregressive distributed lag method has received extensive application in order to capture the short-run and long-run effects as well as the heterogeneity among countries. Pesaran et al. (1999) prove that such an approach yields uniform estimates in dynamic panel data models, with heterogeneous short-run dynamics and common long-run relationships. The second generation of unit root and cointegration methodology has also been used to overcome the problem of cross-sectional dependence, a factor of special concern for research that includes economically linked economies, like the Gulf region. These methodological developments have strengthened empirical results and helped to develop a more differentiated picture of the dynamics of resource-dependent growth. The literature suggests that economic diversification is an important factor to boost long-term growth and resilience in oil-based economies, but its short-term impact is limited by structural and institutional factors. Although the government has been trying to diversify the economy, oil prices continue to play a significant role in the economy. Labour force participation does not seem as important as productivity and human capital, but investment is an important factor in economic growth in the short run, and may become inefficient in the long run. The relationship between these factors highlights the need for thorough policy strategies to support diversification, investment efficiency and institutional quality to generate sustainable and resilient economic development in resource-dependent economies.

3. THEORETICAL LINKS

There are three theories which support the relationship between economic diversification and economic growth in oil-dependent economies, namely structural transformation theory, resource curse theory and endogenous growth theory. Structural transformation theory centres on the shift from primary (oil) to more diversified and productive industries (manufacturing and services sectors) (Samaniego & Sun, 2016; Erumebor, 2025; Rafique et al., 2025). Diversification is a key factor to lessen the impact of external shocks, especially oil price volatility, and sustain the long-term growth of Gulf Cooperation Council (GCC) economies. However, it is important to have a counterpoint to resource curse theory; this theory is related to slower growth in economies with a high reliance on natural resources stemming from volatility, rent-seeking and poor institutional development (Sachs & Warner, 2001; Lin, 2012; Marc, 2024; Longston et al., 2025; Al-Roubaie, 2025). Strong reliance on oil can push less competitive sectors from other sectors of the economy out of the

system and cause less diversification and economic resilience. The multi-dimensionality of diversification and its potential to reduce these negative impacts is captured through the introduction of the Composite Economic Diversification Index that integrates export, sectoral and fiscal diversification. In addition, long-run economic growth is attributed to endogenous factors according to the endogenous growth theory, which include the accumulation of capital, the increase of the labour force, and the development of technology (Ali & Rehman, 2015; Ali & Naeem, 2017; Jones, 2022; Osipian, 2023; Keshminder et al., 2025). In that context, diversification also has a positive impact on growth through innovation, resource reallocation and sector productivity growth. Capital deepening and infrastructure development are proxied by gross capital formation, and the labour force participation rate is an indicator of human capital utilisation. In oil-dependent economies, oil prices have a double effect. Higher oil prices bring benefits to government revenue and investment capacity, which in turn promote economic growth. But the dependence on oil revenues can also create a vicious circle and slow down diversification, which can lead to more volatile growth and a less sustainable path for development (van der Ploeg, 2011; Arezki & van der Ploeg, 2011; Siddiqi et al., 2014; Audi & Ali, 2017; Ahmad et al., 2022; Adegbe et al., 2023; Ali et al., 2025; Chowdhury et al., 2025). In the empirical results, there is a positive relationship between oil price changes and growth; this represents the short-run revenue effect, while diversification represents the long-run structural effect.

The theoretical model can be expressed within a dynamic panel framework as:

$$GDPG_{it} = \alpha + \beta_1 CEDIX_{it} + \beta_2 \ln GCF_{it} + \beta_3 LFPR_{it} + \beta_4 OilPr_{it} + \varepsilon_{it}$$

$$\Delta GDPG_{it} = \phi(GDPG_{it-1} - \theta_1 CEDIX_{it} - \theta_2 \ln GCF_{it} - \theta_3 LFPR_{it} - \theta_4 OilPr_{it}) + \Sigma short-run dynamics + \varepsilon_{it}$$

Where GDPG represents real gross domestic product growth, CEDIX captures economic diversification, $\ln GCF$ reflects investment, LFPR represents labour participation, and OilPr denotes real oil prices. The error correction term (ECM) captures the speed of adjustment toward long-run equilibrium.

The positive and significant long-run coefficient of CEDIX supports the notion that diversification has a positive impact on economic growth, as it decreases the reliance on oil and increases the stability and productivity of the economic structures. The short-run impacts are comparatively small because they involve adjustment costs and reform lags stemming from the process of structural transformation. The coefficient of the ECM is significant and negative, and this suggests that the process of adjustment toward the long-run path is rapid; deviations from the long-run path are quickly corrected. In addition, the consideration of cross-sectional dependence and second-generation panel techniques is indicative of the interdependent nature of the economies of the Gulf countries, where the same shocks affect all of them at the same time, e.g., global oil price fluctuations and financial conditions. This is in tune with the contemporary growth theory that places a significant focus on global integration and global interdependence.

Table 1: Descriptions of the Variables

Variable	Measurement/Definition	Sources
Real GDP Growth (GDPG)	Annual percentage growth rate of real GDP (constant 2015 US\$).	WDI
Composite Economic Diversification Index (CEDIX)	First principal component of EXDIV, SECDIV, REVDIV; scaled 0–1.	WDI
Export concentration (EXDIV)	UNCTAD-normalized HHI of merchandise export shares.	WDI
Sectoral concentration (SECDIV)	HHI of value-added shares across ISIC sectors.	WDI
Revenue concentration (REVDIV)	HHI across oil and non-oil revenue shares.	WDI
Gross Capital Formation ($\ln GCF$)	Gross capital formation deflated by GDP deflator; log used.	WDI
Labour Force Participation Rate (LFPR)	Labour force participation rate (% of population 15+).	WDI
Real Oil Price (OilPr)	Real Brent oil price (US\$/barrel).	WDI

In this study, the effect of economic diversification on economic growth is explored across the Gulf Cooperation Council (GCC) economies using a dynamic panel data approach and covering the period from 2000 to 2024. The use of panel data techniques is appropriate because they allow the estimation and control of unobserved heterogeneity as well as the consideration of both cross-sectional and time series variations. Empirical analysis starts with second-generation panel unit root tests that control for cross-sectional dependence across countries (Im-Pesaran-Shin and Pesaran cross-sectionally augmented tests). This is done so that the stationarity properties of the variables are properly determined and to avoid spurious regression results (Pesaran, 2007). For testing the long-run relationship, the Westerlund error correction-based panel cointegration test is used. This test is powerful for cross-sectional dependence and can be heterogeneous across units in the panel, thereby being suitable for making inferences on the presence of equilibrium relationship(s) between variables. The basic estimation method is the pooled mean group autoregressive distributed lag model that assumes homogeneity of the long-run coefficients across countries, but allows short-run dynamics in each country to differ. (Pesaran et al., 1999) This method is especially useful when analysing the short-term and long-term effects together in a single framework. The error correction term represents the adjustment to long-run equilibrium. To ensure robustness against the presence of heteroskedasticity, autocorrelation and cross-sectional dependence of errors, a fixed effects error correction model is estimated. This guarantees consistency and reliability of the estimated coefficients. World Development Indicators, UNCTAD databases and data from international oil markets (Brent crude oil prices).

4. RESULTS AND DISCUSSION

Table 2 gives an overview of the key macroeconomic variables related to economic growth and structural transformation. The mean growth rate for real GDP is moderate, and there is a significant level of variability, which suggests that there have been changes in performance across the sample. The negative values and the high positive values indicate economic contraction and expansion, indicating sensitivity to external shocks and internal structural conditions. Economic diversification index scores are closer to the centre of their range, reflecting moderate diversification across economies, but with a relatively high standard deviation, which can imply a high degree of heterogeneity in the level of structural transformation of the economies. The log of gross capital formation, representing investment, is relatively low in terms of dispersion, showing a relatively stable pattern of capital accumulation across observations. Labour force participation rate exhibits moderate variability, with different levels of participation across various demographic groups, labour markets and institutional influences affecting the participation of the workforce. There is also evidence of considerable volatility in oil prices, reflecting the impact of fluctuations in global commodity prices that can impact economic growth, especially in resource-dependent economies.

Table 2: Descriptive Statistics

Variables	Mean	Std Dev	Min	Max
GDPG	4.409	4.4707	-7.076	26.17
CEDIX	0.558	0.3363	0	1
lnGCF	24.237	0.9591	21.664	26.333
LFPR	69.892	9.9969	47.891	87.575
OilPr	71.469	14.8372	39.917	111.888

The unit root test results shown in Table 3 give evidence on the stationarity properties of variables based on the Im-Pesaran-Shin as well as the cross-sectionally augmented Im-Pesaran-Shin approaches. Under both tests, real GDP growth seems to be stationary, suggesting no evidence of a stochastic trend and that the growth rate is within a stable range. On the other hand, some of the variables, such as economic diversification, investment, labour participation and oil prices, are non-stationary at level, but become stationary after the first differencing. This indicates that these variables are in a stochastic trend and are of order one. These variables are non-stationary, and thus it is appropriate to use panel cointegration techniques to prevent from getting spurious regression results and to obtain long-run equilibrium relations between variables.

Table 3: Unit Root Test Outcomes

Variables	IPS level	IPS diff	CIPS level	CIPS diff
GDPG	-3.7256		-2.474	-4.196
CEDIX	-1.4145	-6.3005	2.112	-3.966
GCF	0.1432	-4.842	-0.495	-3.271
LFPR	1.4181	-2.9928	0.809	-2.327
OilPr	-1.1038	-4.8405	0.139	-3.224

Table 4 shows that all the Pesaran CD statistics are highly significant, suggesting strong evidence of cross-sectional dependence for all variables. This means that shocks to one unit are likely to reach other units as a result of trade linkages, financial integration or similar global shocks like oil price changes. The average correlation values also indicate strong interdependencies between units, as they tend to be high. The failure to account for the cross-sectional dependence can result in biased and inconsistent estimates, and hence the importance of econometric methods that do take into account these dependencies as second-generation panel methods. Such results highlight the value of employing state-of-the-art panel econometric methods, which take into consideration the integration properties and cross-sectional interdependencies, to produce sound and reliable empirical findings.

Table 4: Cross-sectional dependence (Pesaran CD)

Variables	CD Statistic	P-value	Avg Corr	Abs Corr
GDPG	7.2954	0	0.443	0.443
CEDIX	11.8522	0	0.546	0.546
lnGCF	10.9858	0	0.891	0.891
LFPR	16.8158	0	0.81	0.81
OilPr	14.2933	0	0.969	0.969

The cointegration test results of the error correction model panel of the Westerlund are reported in Table 5 and confirm

the existence of long-term relationships between economic growth, economic diversification, investment, labour participation and oil prices. In the case of cross-sectional dependence, as discussed earlier, the test is especially suitable for the presence of common factors and heterogeneity across the panel units. The results of the group-mean statistics are mixed, but informative. The Gt statistic is negative and statistically significant, suggesting that there is at least one subset of the cross-sectional units for which the null hypothesis of no cointegration is rejected. This indicates that in some economies there is a stable long-run relationship between the variables and deviations from the equilibrium are corrected with time. However, the Ga statistic is not statistically significant, suggesting that the overall evidence of cointegration is weaker. The difference in this sense points to variation in countries with respect to their long-run connections. The panel statistics also support the evidence of cointegration. The null hypothesis of no cointegration is rejected for the panel as the Pt statistic is statistically significant. This indicates that, in the long run, the variables act in the same direction and are in a stable equilibrium relationship. The Pa statistic is not statistically significant under the asymptotic critical values, but it is statistically significant under bootstrap probabilities, which are more informative in the presence of cross-sectional dependence. Both the Gt and the Pt statistics give robust bootstrap support for the cointegration relationship, which confirms the robustness of the relationship and thus the presence of long-run equilibrium between the variables. The results suggest that, in the long run, economic diversification, investment, labour force participation and oil price are not standalone and work in tandem with economic growth through equilibrium adjustment mechanisms. The error correction model and long-run estimators like fully modified ordinary least squares or dynamic ordinary least squares can be used to capture both short-run dynamics and long-term relationships since the data are cointegrated. It also implies that policy measures on one variable, like diversification or investment, will have long-term consequences on the economy because of these interdependencies. This offers a solid econometric basis for further analysis and serves as a supporting theory that suggests that structural change, the stock of capital, labour forces and exogenous variables like oil prices all shape the long-term economic growth paths.

Table 5: Westerlund ECM Panel Cointegration Test

Statistic	Value	Z-value	P-value	Bootstrap P-value
Gt	-3.447	-2.9874	0.005	0.013
Ga	-6.612	2.3585	0.979	0.08
Pt	-7.047	-1.3297	0.05	0.037
Pa	-6.179	1.1621	0.844	0.085

The panel autoregressive distributed lag estimates in Table 6 offer valuable information on the long-run equilibrium relationships and short-run dynamics between economic growth and its determinants for both the pooled mean group and mean group estimators. Both estimators enable comparisons of homogeneous long-run relationships and heterogeneous country-specific dynamics. Economic diversification for the pooled mean group specification has a positive and statistically significant coefficient, suggesting that an increase in economic diversification is positively associated with economic growth in the long run. The study implies that economies are more stable and sustainable when less reliant on a few sectors. Diversification is an important source of resilience against external shocks and of structural transformation, which is essential for long term development (Pesaran et al., 1999; Lederman & Maloney, 2012; Ahmad et al., 2018). Under the pooled mean group estimator, the coefficient for investment (gross capital formation) is negative and statistically significant. This is a paradoxical outcome and could be a result of capital allocation inefficiencies, diminishing returns to investment, or there may be unproductive investments. It seems that simply investing more is not enough to cause growth if that investment is not made in productive and efficient industries. This result is in line with the literature, which argues that investment quality and efficiency are the most important factors rather than the quantity (Ahmad & Wu, 2022; Agustian et al., 2023). Looking at the statistics, the labour force participation rate seems not to matter significantly, suggesting that under this model, labour supply does not directly affect economic growth in the long run. This might imply that without additional increases in human capital, productivity and institutional quality, an increase in the quality of labour is not enough to propel growth. This finding is consistent with research highlighting the role of labour quality over participation (Gwinnutt et al., 2023; Martzoukou et al., 2024).

**Table 6: Panel ARDL estimates
DV: GDPG**

Variables	PMG Coef	PMG P	MG Coef	MG P
CEDIX	13.8189	0.039	-2.8087	0.883
lnGCF	-5.8166	0.001	1.0201	0.887
LFPR	-0.0087	0.971	-0.2598	0.446
OilPr	0.0866	0.021	-0.1078	0.879
ECM	-0.7155	0	-1.5029	0

The pooled mean group estimator suggests that there is a positive and statistically significant relationship between oil

prices and economic growth for the sample, suggesting that higher oil prices are good for the economies in the sample. This implies that the sample could contain oil-exporting or resource-dependent economies that benefit from commodity price fluctuations. This is in line with the findings of the literature on resource-dependent growth that oil revenues stimulate fiscal growth and economic activity (Hamilton, 2009; Kilian, 2008; Sachs & Warner, 2001; van der Ploeg, 2011). The error correction term is negative and significant, thus indicating that there is a stable long-run relationship between the variables. The size is construed as a relatively quick rate of adjustment, such that deviations from equilibrium are adjusted efficiently over time. This validates the cointegration results and provides support for using the panel autoregressive distributed lag framework (Pesaran et al., 1999; Pesaran, 2007). The opposite is true of the mean group estimates, however: most of the coefficients of the explanatory variables are close to 0, suggesting that there is a significant amount of heterogeneity across countries. The differences in the pooled mean group and the mean group results indicate that although there is a common long-run relationship, it is possible for the short-run dynamics and adjustment processes in each of the individual countries to be different. The mean group estimator permits complete heterogeneity, and the insignificance of this parameter indicates that the effects of diversification, investment, labour participation and oil prices are not the same across all units.

Table 7 presents results of the fixed effects error correction model (ECM) with Driscoll–Kraay standard errors, which is robust to cross-sectional dependence and heteroskedasticity and offers convincing evidence on the long-run equilibrium relationships and short-run dynamics affecting economic growth. The coefficients of the long run indicate that the level of economic diversification is a significant and positive determinant of economic growth. Thus, attaining a level of economic diversification will lead to increased and more stable economic growth. This result confirms the previous mean group results and underscores the value of diversification beyond a few sectors to boost both resistance and resilience (Lederman & Maloney, 2012; Pesaran et al., 1999). Investment, on the other hand, still has a negative and statistically significant long-run effect, which indicates inefficiencies in the allocation of capital or a declining impact. This means that the productivity and sectoral allocation of investment are critical to the effectiveness of investment, and are important even if the total size of the investment is not. Labour force participation is statistically insignificant in the long run, suggesting that labour supply alone can be important for growth only if there are productivity and quality of human capital gains. In contrast, the long-run effect of oil prices is positive and highly significant, suggesting that the economies in the sample benefit from higher oil prices, perhaps because of the importance of resource dependency and export revenues (Hamilton, 2009; Kilian, 2008; Sachs & Warner, 2001; van der Ploeg, 2011). The error correction term is negative and significant, and larger than in previous models, suggesting quick adjustment to the long-run equilibrium. The result confirms the strong cointegration between the variables, with the implication that any deviations from the cointegration level are corrected quickly in a short period (Pesaran et al., 1999; Pesaran, 2007). Additional important insights can be gleaned from the short-run dynamics.

Table 7: Robustness: FE-ECM with Driscoll–Kraay SEs
DV: ΔGDPG

Variables	Coefficient	P-value
CEDIX	26.9751	0.002
lnGCF	-8.0252	0
LFPR	-0.0229	0.231
OilPr	0.2242	0
ECM	-0.8682	0
Delta CEDIX	9.2958	0.022
Delta CEDIX lag	-4.7438	0.298
Delta lnGCF	2.7805	0.055
Delta LFPR	1.0129	0.021
Delta LFPR lag	0.4167	0.406
Delta OilPr	0.171	0.002
Delta OilPr lag	-0.1691	0.007
Constant	144.9701	0.001

The economic diversification change is positive and statistically significant, thus showing that economic growth will improve with an increase in economic diversification. It has no lagged effect, however, meaning that the short-term benefits are non-permanent. It reiterates the need for ongoing structural change for continuing growth. The increase in investment has a positive but non-significant short-term effect, whereas the negative long-term effect suggests that if investment is not managed well, it can boost short-term growth rates at an inefficient rate in the long run. Looking specifically at the short run, labour force participation has a positive and statistically significant impact, and an increase in labour force participation can increase short-run economic growth, although its long-run effect is insignificant. This implies that there is a potential for temporary growth boosts from labour market expansion, especially in response to economic cycles. The short-run effect of oil prices is positive and significant, and the lagged change is negative and

significant, suggesting a process of dynamic adjustment. This implies that a rise in oil prices can temporarily boost growth, but the impact can turn negative during later periods because of the volatility of oil prices, inflationary pressures or policy changes (Hamilton, 2009; Kilian, 2008; Sachs & Warner, 2001; van der Ploeg, 2011). The large and significant error correction term confirms the existence of a stable long-run relationship, while the use of Driscoll–Kraay standard errors helps ensure the results are valid in the presence of cross-sectional dependence and heterogeneity.

5. CONCLUSIONS

This study's main goal was to explore the effect of economic diversification on economic growth in OPEC economies in the Gulf Cooperation Council (GCC) from 2000 to 2024. The analysis takes into account the long-run relationships and short-run dynamics, using the Composite Economic Diversification Index computed through principal component analysis, and the advanced macroeconometric techniques of pooled mean group autoregressive distributed lag, second-generation unit root and cointegration tests, and fixed-effects error correction models with Driscoll–Kraay standard errors, all of which account for cross-sectional dependence and heterogeneity among economies. The empirical results confirm that economic diversification in the long run has a positive and statistically significant impact on economic growth. This is validation that less dependence on oil revenues and more reliance on non-oil industries increases the stability, resilience and productivity of the economies. The large and negative error correction term further confirms that there exists a fast adjustment towards long-run equilibrium, which is indicative of an efficient correction of deviations from the growth path. Conversely, the short-run impact of diversification is the comparatively small benefits of diversifying, which is due to the existence of adjustment costs and reform lags in structural transformation processes. The negative long-run effect of investment suggests that investment may not be very efficient at allocating resources, and the positive short-run effect suggests that investment can boost the cycle of growth but may not lead to long-run growth unless there is an increase in efficiency. In the long run, the importance of labour force participation seems to be negligible, emphasising the role of labour quality and productivity instead of participation rates. Growth in these economies is still positively and significantly influenced by oil prices in both the short term and long term, indicating the ongoing relevance of the oil revenues in guiding economic performance in these economies. The findings provide confirmation of the resource curse theory that suggests that overreliance on oil revenue is dangerous, and of endogenous growth theory, which shows the importance of diversification in improving productivity and innovation. The strong link between diversification and growth is another example of how restructuring in oil-dependent economies is needed to sustain economic expansion and involve both sectoral and fiscal restructuring. Policy implications from the study indicate that there is a need for policies that would support non-oil exports, industrial development, and fiscal rebalancing in terms of strategy for diversification in the economies of the GCC. Building institutional capacity, making investment more efficient and boosting human capacity building is crucial for sustaining future growth. Moreover, when managed well, oil revenues can be directed towards productive activities and thus help mitigate volatility and support sustainable economic development.

REFERENCES

- Abdelkawy, N. A. (2024). Diversification and the resource curse: an econometric analysis of GCC countries. *Economies*, 12(11), 287.
- Adegbe, F. F., Ajayi, A., Agugum, T. A., & Otitolaiye, E. D. (2023). Diversification of the economy, tax revenue and sustainable growth in Nigeria. *International Journal of Innovative Research and Scientific Studies*, 6(1), 115-127.
- Adom, N. (2023). *The nexus of oil production, democracy and economic diversification in Ghana* (Doctoral dissertation, Anglia Ruskin Research Online (ARRO)).
- Agustian, K., Pohan, A., Zen, A., Wiwin, W., & Malik, A. J. (2023). Human resource management strategies in achieving competitive advantage in business administration. *Journal of Contemporary Administration and Management (ADMAN)*, 1(2), 108-117.
- Ahmad, K., Ali, A., & Yang, M. (2022). The effect of trade liberalization on expenditure structure of Pakistan. *Bulletin of Business and Economics (BBE)*, 11(1), 73-84.
- Ahmad, K., Ali, S., & Ali, A. (2018). Trade Revenue Implications of Trade Liberalization in Pakistan. *Pakistan Journal of Applied Economics*.
- Ahmad, M., & Wu, Q. (2022). Does herding behavior matter in investment management and perceived market efficiency? Evidence from an emerging market. *Management Decision*, 60(8), 2148-2173.
- Ali, A., & Audi, M. (2023). Analyzing the impact of foreign capital inflows on the current account balance in developing economies: A panel data approach. *Journal of Applied Economic Sciences*, 18(2), 80.
- Ali, A., & Naeem, M. Z. (2017). Trade Liberalization and Fiscal Management of Pakistan: A Brief Overview. *Policy Brief-Department of Economics, PU, Lahore*, 1(1), 1-6.
- Ali, A., & Rehman, H. U. (2015). Macroeconomic instability and its impact on gross domestic product: an empirical analysis of Pakistan. *Pakistan Economic and Social Review*, 285-316.
- Ali, A., Jabeen, R., & Ahmad, K. (2025). Hidden Drivers of Financial Success: Exploring the Role of Trade Secrets in US Corporate Performance. *Competitive Research Journal Archive*, 3(02), 421-439.
- Alkhateeb, T. T. Y., Mahmood, H., Sultan, Z. A., and Ahmad, N. (2017). Oil price and economic growth. *International Journal of Energy Economics and Policy*, 7(3), 152–158.
- Al-Kuwari, M. (2025). Escaping the oil curse: The road to economic diversification in the GCC region. In *Public Policy in Gulf States: In Times of Fast Paced and Complex Challenges* (pp. 37-56). Singapore: Springer Nature Singapore.

- Almutairi, H., Galeotti, M., Manzano, B., & Pierru, A. (2024). Resilience of Saudi Arabia's economy to oil shocks: Effects of economic reforms. *The Energy Journal*, 45(5), 125-148.
- Al-Roubaie, A. S. (2025). Impact of emerging technologies on economic diversification: the case of Saudi Arabia. *Journal of Business and Socio-Economic Development*, 5(4), 402-416.
- Amir, H., Khan, M., & Bilal, K. (2015). Impact of educated labor force on Economic growth of Pakistan: A human capital perspective. *European Online Journal of Natural and Social Sciences*, 4(4), pp-814.
- Apeaning, R., Kamboj, P., Hejazi, M., Qiu, Y., Kyle, P., & Iyer, G. (2025). Assessing the impact of energy transition initiatives on the policy cost of Saudi Arabia's net-zero ambition. *Energy and Climate Change*, 6, 100184.
- Arezki, R., & van der Ploeg, F. (2011). Do natural resources depress income per capita? *Review of Development Economics*, 15(3), 504-521.
- Arezki, R., and Cherif, R. (2010). A tale of two states. *Journal of Development Economics*, 92(1), 1-17.
- Arshi, A., Ali, A., & Audi, M. (2025). Evaluating the Impact of Sustainability Reporting on Financial Performance: The Mediating Role of ESG Performance and the Moderating Role of Firm Size. *Bulletin of Business and Economics (BBE)*, 14(2), 42-54.
- Ateba, B. B., & Enwereji, P. C. (2024). The resource curse in the Gulf region: Charting a path for long-term economic sustainability. *International Journal of Energy Economics and Policy*, 14(5), 259-270.
- Audi, M., & Al Masri, R. (2024). Examining the impacts of regulatory framework on risk in commercial banks in emerging economies. *Journal of Business and Economic Options*, 7(2), 10-19.
- Audi, M., & Ali, A. (2017). Gender gap and trade liberalization: an analysis of some selected SAARC countries. *Advances in Social Sciences Research Journal*.
- Audi, M., & Ali, A. (2022). Public policy and economic misery nexus: a comparative analysis of developed and developing world. *International Journal of Economics and Financial Issues*, 13(3), 56-73.
- Audi, M., Sadiq, A., & Ali, A. (2021). Performance Evaluation of Islamic and Non-Islamic Equity and Bonds Indices. Evidence from Selected Emerging and Developed Countries. *Journal of Applied Economic Sciences*, 16(3), 251.
- Awolaja, O., Ajibola, O., & Joseph, T. (2024). External shocks, economic resilience and economic growth in sub-Saharan Africa countries: a case study of Nigeria. *African Economic and Management Review*, 4(1), 1-8.
- Briguglio, L., Cordina, G., Farrugia, N., and Vella, S. (2009). Economic vulnerability and resilience. *Oxford Development Studies*, 37(3), 229-247.
- Buheji, M. (2018). *Understanding the power of resilience economy: An inter-disciplinary perspective to change the world attitude to socio-economic crisis*. Mohamed Buheji.
- Callen, T., Cherif, R., Hasanov, F., Hegazy, A., and Khandelwal, P. (2014). Economic diversification in the GCC. *IMF Staff Discussion Note*, 14(12), 1-27.
- Cherif, R., Hasanov, F., and Zhu, M. (2016). Breaking the oil spell. *IMF Working Paper*, 16(105), 1-43.
- Chowdhury, A., Tadjeddin, Z., & Vidyattama, Y. (2025). Concepts and Issues. In *Structural Transformation as Development: Path Dependence and Geopolitics* (pp. 27-59). Singapore: Springer Nature Singapore.
- Devarajan, S., Swaroop, V., and Zou, H. (1996). The composition of public expenditure. *Journal of Monetary Economics*, 37(2), 313-344.
- El-Katiri, L. (2013). Anatomy of an Oil-Based Welfare State. *The Transformation of the Gulf: Politics, Economics and the Global Order*, 165.
- Ertimi, B., Sarmidi, T., Khalid, N., & Helmi Ali, M. (2021). The policy framework of natural resource management in oil-dependence countries. *Economies*, 9(1), 25.
- Erumebor, W. R. (2025). *Structural transformation, productivity growth and employment in Nigeria* (Doctoral dissertation, Doctoral dissertation, University of London).
- Espinoza, R., and Prasad, A. (2010). Non-oil growth in the GCC. *IMF Working Paper*, 10(1), 1-29.
- Farras, A., Ali, A., & Audi, M. (2025). Advancing audit practices through technology: a comprehensive review of continuous auditing. *Journal of Social Signs Review*, 3(2), 506-539.
- Gelb, A., Eifert, B., & Tallroth, N. B. (2002). The political economy of fiscal policy and economic management in oil-exporting countries. *Available at SSRN* 636262.
- Gwinnutt, J. M., Wieczorek, M., Balanescu, A., Bischoff-Ferrari, H. A., Boonen, A., Cavalli, G., ... & Verstappen, S. M. (2023). 2021 EULAR recommendations regarding lifestyle behaviours and work participation to prevent progression of rheumatic and musculoskeletal diseases. *Annals of the rheumatic diseases*, 82(1), 48-56.
- Gylfason, T. (2001). Natural resources, education, and economic development. *European Economic Review*, 45(4-6), 847-859.
- Hamilton, J. D. (2009). Causes and consequences of the oil shock. *Brookings Papers on Economic Activity*, 2009(1), 215-261.
- Hasanov, F., Mikayilov, J., and Aliyev, K. (2018). Impact of oil prices on economic growth. *Resources Policy*, 56, 1-9.
- Helkiah, L., Maingi, M., & Otuya, W. (2025). Effect of Inflation Risk on the Public Debt in Kenya. *Journal of Accounting and Finance in Emerging Economies*, 11(3), 459-472.
- Hertog, S. (2014). Arab Gulf states and economic diversification. *Journal of Economic Perspectives*, 28(3), 55-78.
- Hesse, H. (2008). Export diversification and economic growth. *Commission on Growth and Development Working Paper*, 21, 1-28.
- Imam, P. (2013). Labor market dynamics in the GCC. *IMF Working Paper*, 13(35), 1-25.

- Jafari, A., & Faghihi, E. (2024). Beyond oil: Strategic tax and investment reforms for Iran's economic resilience and diversification. *Business, Marketing, and Finance Open*, 1(5), 64-89.
- Jones, C. I. (2022). The past and future of economic growth: A semi-endogenous perspective. *Annual Review of Economics*, 14(1), 125-152.
- Joya, O. (2015). Economic diversification and growth. *International Review of Applied Economics*, 29(2), 254-277.
- Keshminder, J. S., Woźniak, M., Kusa, R., Ridzuan, A. R., & Erum, N. (2025). Endogenous growth and the influence of information and communication technology on Poland's economic trajectory. *Open Research Europe*, 5, 131.
- Khalid, U., Ali, A., & Audi, M. (2025). Understanding Borrowing Behaviour in the EU: The Role of Mobile Payments, Financial Literacy, and Financial Access. *Annual Methodological Archive Research Review*, 3(5), 41-66.
- Khan, M. S., Audi, M., & Ali, A. (2025). Foreign Direct Investment, Financial Development, and Sustainable Growth: Empirical Evidence from Developing Countries. *Journal of Social Signs Review*, 3(8), 189-211.
- Khorsheed, M. S. (2015). Saudi Arabia: From Oil Kingdom to Knowledge-Based Economy. *Middle East Policy*, 22(3), 147.
- Kilian, L. (2008). The economic effects of energy price shocks. *Journal of Economic Literature*, 46(4), 871-909.
- Lederman, D., and Maloney, W. F. (2012). Does what you export matter. *World Bank Research Observer*, 27(2), 248-275.
- Lin, J. Y. (2012). From flying geese to leading dragons: New opportunities and strategies for structural transformation in developing countries 1. *Global Policy*, 3(4), 397-409.
- Longston, P., Ali, A., & Audi, A. (2025). Environmental, Social & Governance Disclosures and Corporate Financial Performance: Evidence from Selected Asian Economies. *Pakistan Journal of Social Science Review*, 4(1), 22-49.
- Marc, A., Sulehri, F.A., Ali, A., & Al-Masri, R. (2022). An Event Based Analysis of Stock Return and Political Uncertainty in Pakistan: Revisited. *International Journal of Economics and Financial Issues*.
- Marc, A. (2024). The impact of exchange rate volatility on long-term economic growth: Insights from Lebanon. *Journal of Policy Options*, 7(2), 1-10.
- Marc, A., Ehsan, R., & Ali, A. (2022). Does Globalization Promote Financial Integration in South Asian Economies? Unveiling the Role of Monetary and Fiscal Performance in Internationalization. *Empirical Economics Letters*, 22(10), 237-248.
- Marc, A., Poulin, M., & Ali, A. (2023). Determinants of Human Wellbeing and its Prospect Under the Role of Financial Inclusion in South Asian Countries. *Journal of Applied Economic Sciences*, 18(4), 296.
- Marc, A., Poulin, M., Ahmad, K., & Ali, A. (2025). Modeling disaggregate globalization to carbon emissions in BRICS: A panel quantile regression analysis. *Sustainability*, 17(6), 2638.
- Martoukou, K., Luders, E. S., Mair, J., Kostagiolas, P., Johnson, N., Work, F., & Fulton, C. (2024). A cross-sectional study of discipline-based self-perceived digital literacy competencies of nursing students. *Journal of advanced nursing*, 80(2), 656-672.
- Mbodj, A., & Laye, S. (2025). Reducing poverty through financial growth: The impact of financial inclusion and development in emerging economies. *Journal of Business and Economic Options*, 8(1), 61-76.
- Mensi, W., Shahzad, S. J. H., Hammoudeh, S., & Al-Yahyaee, K. H. (2018). Asymmetric impacts of public and private investments on the non-oil GDP of Saudi Arabia. *International Economics*, 156, 15-30.
- Mohaddes, K., and Raissi, M. (2017). Do sovereign wealth funds dampen oil shocks. *Journal of Commodity Markets*, 8, 18-29.
- Naeem, H. Ali, A., & Audi, M. (2025). The Impact of Financial Stability on Environmental Degradation: Mediating Role of Green Investment and Moderating Role of Environmental Awareness. *Policy Journal of Social Science Review*, 3(1), 448-469.
- Nurunnabi, M. (2017). Transformation from an oil-based economy to a knowledge-based economy in Saudi Arabia: the direction of Saudi vision 2030. *Journal of the Knowledge Economy*, 8(2), 536-564.
- Nusair, S. A. (2016). The relationship between oil prices and economic growth. *Energy Economics*, 59, 305-314.
- Osipian, A. L. (2023). Endogenous economic growth and human capital. In *Sustainable Economic Growth in Russia: A Structuralist Approach* (pp. 43-62). Cham: Springer Nature Switzerland.
- Papyrakis, E., and Gerlagh, R. (2004). The resource curse hypothesis. *Journal of Development Economics*, 74(1), 181-193.
- Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, 22(2), 265-312.
- Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*, 94(446), 621-634.
- Prest, B. C. (2022). Supply-side reforms to oil and gas production on federal lands: modeling the implications for CO2 emissions, federal revenues, and leakage. *Journal of the Association of Environmental and Resource Economists*, 9(4), 681-720.
- Rafique, A., Ali, A., & Audi, M. (2025). Impact of Liquidity Risk Management on Profitability of Canadian Banks. *Annual Methodological Archive Research Review*, 3(1), 1-20.
- Razzak, W. (2022). *The Future of Economic Development in the Gulf Cooperation Council States: Evidence-Based Policy Analysis*. Taylor & Francis.
- Ross, M. L., & Werker, E. (2024). Diversification in resource-rich Africa, 1999-2019. *Resources Policy*, 88, 104437.
- Roussel, Y., & Audi, M. (2024). Exploring the Nexus of Economic Expansion, Tourist Inflows, and Environmental

- Sustainability in Europe. *Journal of Energy and Environmental Policy Options*, 7(1), 28-36.
- Sachs, J. D., and Warner, A. M. (2001). The curse of natural resources. *European Economic Review*, 45(4–6), 827–838.
- Samaniego, R. M., & Sun, J. Y. (2016). Productivity growth and structural transformation. *Review of Economic Dynamics*, 21, 266-285.
- Samusenko, S. A., & Zimniakova, T. S. (2021). What drives labour productivity growth: a case of regional economy. *Журнал Сибирского федерального университета. Гуманитарные науки*, 14(12), 1873-1884.
- Siddiqi, M. W., Ali, A., & Chani, M. I. (2014). Import demand, economic development and trade liberalization in Pakistan: an empirical analysis. *Bulletin of Business and Economics (BBE)*, 3(2), 131-141.
- Slothuus, L. (2025). Facing a fossil free future through the past: The importance of history for understanding fossil fuel phaseouts. *Energy Research & Social Science*, 121, 103971.
- Tagliapietra, S. (2019). The impact of the global energy transition on MENA oil and gas producers. *Energy strategy reviews*, 26, 100397.
- Umair, S. M., Ali, A., & Audi, M. (2025). Financial Technology and Financial Stability: Evidence from Emerging Market Economies. *Research Consortium Archive*, 3(1), 506-531.
- van der Ploeg, F. (2011). Natural resources and economic growth. *Journal of Economic Literature*, 49(2), 366–420.
- van der Ploeg, F., and Poelhekke, S. (2009). Volatility and the natural resource curse. *Oxford Economic Papers*, 61(4), 727–760.
- Yaqub, K. Q. (2019). *Impact of oil revenue volatility on the real exchange rate and the structure of economy: Empirical evidence of “Dutch disease” in Iraq* (Doctoral dissertation, University of Bradford).
- Zhang, X., & Xi, Y. (2024). Green finance, private investments and fossil fuels rents. *Resources Policy*, 99, 105415.
- Zheng, Z., Lisovskiy, A., Vasa, L., Strielkowski, W., & Yang, Y. (2023). Resources curse and sustainable development perspective: Fresh evidence from oil rich countries. *Resources Policy*, 85, 103698.

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