"Human Capital and Economic Diversification Under Uncertainty in Arab Oil Exporting Countries"

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Abstract

Economic diversification provides a rough picture of the productive capabilities of a country. Recently both political and economic disruption pushed a focus on the diversification need. The research seeks to investigate the impact of human capital on economic diversification under the current economic uncertainty in 6 oil-abundant Arab countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and UAE) over the period (2000-2023). The research deploys PARDL model. The research reveals that; **Uncertainty** and **Governance Index have** ***a positive and statistically significant, while Mean Years of Schooling and oil rents have a negative significant impact on economic diversification, in the long run; Uncertainty*** and **Governance Index have both** negative but insignificant influence on economic diversification while **Mean Years of Schooling and oil rents both have positive** but insignificant effect of education on diversification.

Keywords: Economic Diversification, Oil rents, human capital, and uncertainty

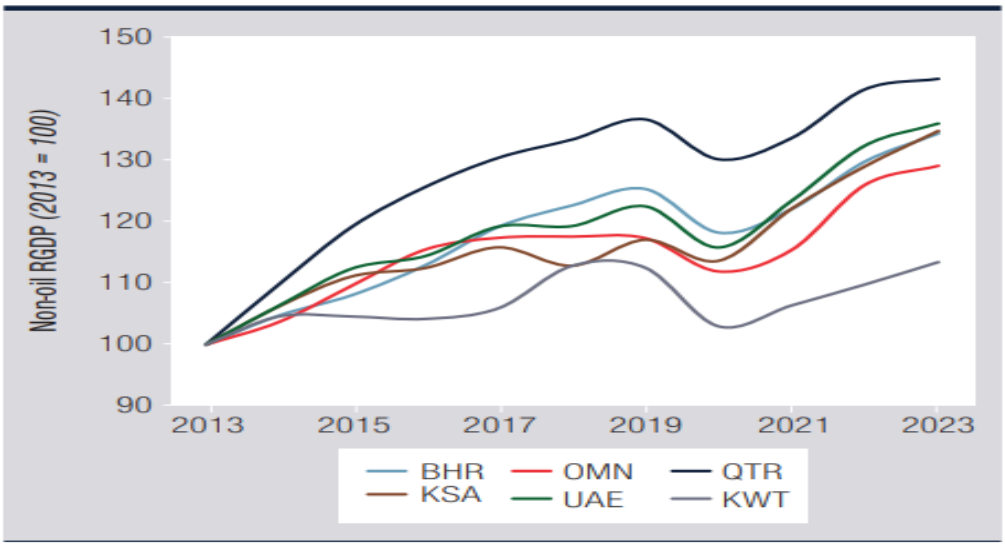
JEL Classifications: O43, O53, j24, D8

Introduction

Economic diversification is deemed to be a cornerstone. It provides a rough picture of the productive capabilities of a country. It has been shown to have a positive relationship with economic growth. For rich oil countries economic diversification aims to minimize the risks which are associated with oil price fluctuations. Studies have found economic diversification is necessary for sustainable long-term growth (Pasinetti 1983; Saviotti 1996). For Arab Oil-rich countries it has become an essential role due to the highly fluctuating in oil prices. However, this diversification would not be sustainable if it is not combined with the proper Human capital and good governance polices. As poor governance has proven it can prevent the progress of economic diversification in resource-rich countries (Omgba, 2014; Makhlouf et al., 2015; Boschma & Capone, 2015; Nguyen et al., 2019; Amiri et al., 2019). Bravo-Ortega and de Gregorio (2007) find that the larger the stock of human capital, the more positive the marginal effect of natural resource abundance on growth. Lederman and Maloney (2007) echo this message, noting that rich countries that have successfully used their natural resources to further development outcomes, such as Australia and Norway, have done so based on high and growing levels of human capital. Economic diversification occurs in two directions—vertical and horizontal. Vertical diversification concentrates the process of expansion within a sector by introducing additional steps. Hvidt (2013) argues that this form of diversification occurs in a backwards and forwards direction in the stages of an industry. Arab rich oil countries are still in the primary phase, which is the process of extraction of a raw material (e.g., a natural energy resource). Horizontal diversification, on the other hand, entails the expansion of different possibilities for innovative products. Recently, the GCC countries have turned to this category of diversification as illustrated by their investments in non-hydrocarbon fields such as culture, tourism, and sport.
Starting from the sharp drop in oil prices that has started in 2014, continuing the high oil prices fluctuations combined with both global market uncertainties and geopolitical disruption pushed to review the attention towards more economic diversification based on concrete economic structural.

Despite the positive achievements in diversification process and the development of non-oil sectors are progressing in the GCC countries (Figure 1), The majority of GCC countries are strengthening their economic resilience by enacting strategic policy reforms and boosting investments in key sectors including tourism, financial services, and technology. Saudi Arabia recently launched NEOM for sustainable food production and for arts and entertainment (Utamo) while UAE approved a US$10 billion investment in tourism infrastructure and US$10.9 billion public-private partnership portfolio (Gulf outlook 2024)

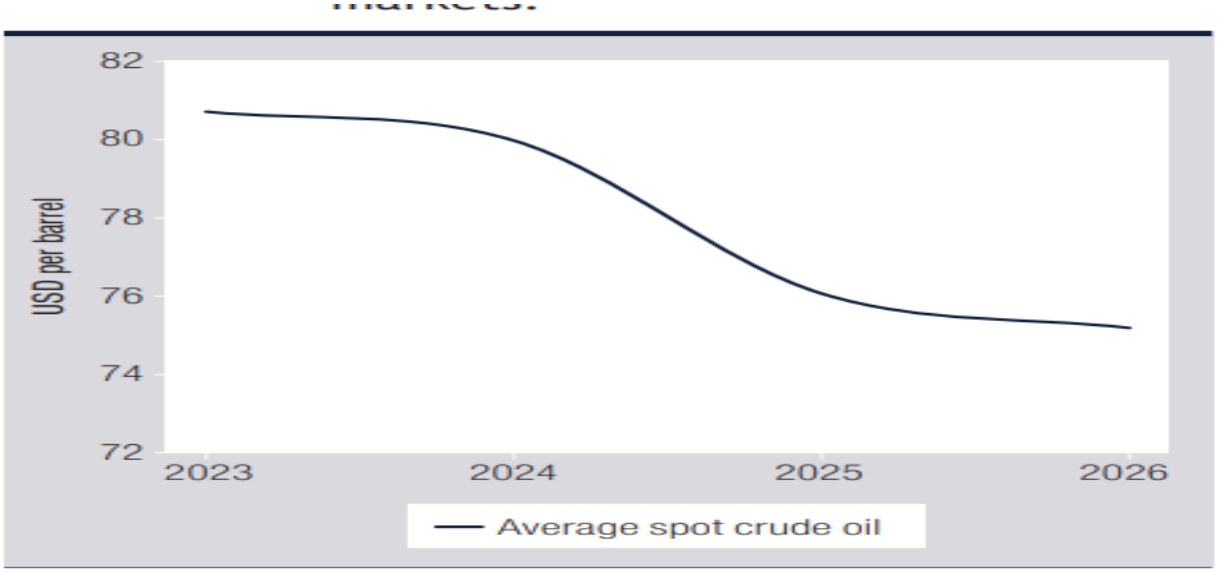
Figure (1) The development of non-oil sectors (2013-2023)



Source: Haver and WB staff calculations.

The consecutive crisis in recent years under uncertainty and geopolitics disruption even with production cuts, average, oil prices are expected to face a further decline anticipated in 2026 (figure 2). According to Gulf outlook report 2024 "*It is estimated that a 10 percent negative/positive shock on oil price will reduce/increase regional GDP growth by 0.6 percentage point, fiscal balance by 1.8 percent of GDP, and current account balance by 1.5 percent of GDP*" These risks highlight the need to accelerate the pace of diversification a way from oil sectors.

Figure (2) Oil prices Projection



Source: Commodity Market Outlook, Mar 2024.

Based on the above the research is investigating the impact of human capital measured by years of schooling, good governance, and the recent spreading of political and economic uncertainty on the diversification process which became a vital path for

GCC countries. In tackling this research under the main hypothesis that raising the level of human capital and effective implementation of sound governance will have a significant impact on Economic Diversification, while uncertainty would have a reserve negative impact on the process of shifting away from concentration. The main findings ***that;*** *Uncertainty and Governance Index have a positive and statistically significant, while Mean Years of Schooling and oil rents have a negative significant impact on economic diversification, in the long run; Uncertainty and Governance Index have both negative but insignificant influence on economic diversification while Mean Years of Schooling and oil rents both have positive but insignificant effect of education on diversification.*

The rest of this paper is organised as follows: The second section tackle the conceptional framework; the third section reviews the literature review; the fourth presents the methodological issues; the fourth section presents the results and discussion; and the final section concludes the paper with policy implications.

2.Conceptual Framework

2.1 Diversification meaning and measurements

Maintaining long-term economic growth implies economic diversification. When mining and agriculture provide most the economy's revenue, it is difficult to sustain long-term economic growth due to instability in the cost of commodities and allocative inefficiencies as manufacturing and services account for a sizable portion of the GDP in vibrant economies. The policy problem is particularly pressing in resource-dependent economies where these economies are poorly due to highly dependent on extractive sectors. ***UNCTAD*** *defines an economy as commodity-dependent when over 60 per cent of its total merchandise export revenues stem from primary commodities, such as food and agricultural raw materials, fuels, and minerals. Under this definition, about 101 countries were commodity-dependent1 in 2019-2021, of which 95 were developing countries and 34 were Least Developed Countries (UNCTAD, 2023a)*

Economic diversification is typically *understood as the process by which an economy broadens its range of goods and services produced*. While Export diversification refers to the degree to which an economy exports products across various sectors or trading partners (UNCTAD, 2018c). Export diversification specifically involves intentional policies aimed at altering the proportions of commodities within the current export mix, introducing new products into the export portfolio, and/or entering new geographical markets. Both forms of diversification are thought to drive economic growth, foster an environment that supports productive investment, and mitigate short-term macroeconomic fluctuations. Some scholars emphasizes that export diversification can prompt long-term growth, showing positive and significant correlations between per capita income and export diversification (Hausmann et al., 2007)

Diversification process could be forum into; (I) Domestic production diversification: that boost productivity, resources are reallocated across different sectors, this would imply a structural change in production from low-productivity to high-productivity activities. (ii) Trade diversification by bringing new goods or services into the market. transferring current goods to new markets through export.

improving the overall quality of goods that are exported. (iv) Distributing economic activity across the primary sector (agricultural), manufacturing, and services sectors, this sectoral diversification aims to engage a greater proportion of society in a wider range of economic activities.

Measurement of Economics Diversification; There are three approaches for measuring economic diversification: variety-based, quality-based, and output-based. Variety-based measures gauge the diversity of economic activities (Strauss-Kahn 2013; Ross 2017). Quality-based measures structural change to diversification (McMillan at al .2014), where shifting toward economic activities with greater value addition and market competitive advantage. The third approach deals with output-based that measures changes in non-resource production. The most common measures as follows.

1. **Herfindahl-Hirschman Index (HHI)**: This indicator is a measure of the dispersion of trade value across an exporter's partners. A county with a preponderance of trade value concentrated in a very few markets will have an index value close to 1. Thus, it is an indicator of the exporter's dependency on its trading partners and the danger it could face should its partners increase trade barriers. Measured over time, a fall in the index may be an indication of diversification in the exporter's trading partnerships. The user has the option of selecting product clusters, which will return the index calculated only for that specified subset of countries. Note that if a country exports to only a single market, then the indicator returns no value (World Bank data catalogue).
2. **Economic Sector Contributions**: The contribution of the major economy sectors (agriculture, manufacturing, and services) to GDP is a fundamental measure of diversification. The lack of balanced contribution from various sectors the higher level of concertation.
3. **Export Sophistication Index**:

This index assesses the complexity and value-added of country's exports. The more sophisticated export structure indicates more diversified economy that is capable of producing a diversified goods to shift from raw materials .

4. **Theil Index**:

Used to measure diversification, particularly in exports. It differentiates between the contributions of new and existing sectors to overall diversification, providing insights into how diversification evolves over time (Cadot et al. (2011)

5. **Global Economic Diversification Index (EDI)**:

The EDI ranks countries based on a set of quantitative indicators that reflect their economic diversification. This index includes metrics related to economic activity, international trade, and government revenue diversification. It provides a comprehensive assessment of diversification efforts across different nations. (Global Economic Diversification Index 2024 – MBRSG)

2.2 Diversification strategies

Diversification can be either horizontal diversification where the economy generates new opportunities for new products within the same sector or vertical diversification or can be terms by diagonal diversification which entails adding more stages of processing for a domestic or imported goods. Vertical diversification could be forward and backward linkages where the output of one activity becomes the input of another. This would upgrade the value-added of domestic production. Furthermore, vertical diversification encourages the shift from one sector to another, moving with the industry, shifting from the primary to the secondary sectors.

Successful diversification example is Malaysia, resource-based businesses were incentivized in the mid-1980s to participate in increased value addition and manufacturing activities, particularly in the palm oil, This was result of a government-led diversification policy that was supported by economic incentives, trade promotion, and skill development in order to reduce the concentration in raw commodities and strengthen the manufacturing sector, and providing research and development (R&D) support (Lebdioui, 2022). Where Palm oil industry created linkages of palm-oil-based products, which presently include edible oils and fats, biofuels, and oleochemicals. Also in Mauritius, that was sugar focused economy to become a significant exporter of textiles, information technology components, and services, including tourism (Mosley, 2018). The collapse in sugar prices in the mid-1970s. pushed the Mauritian government to develop the textile industry through the establishment of export processing zones, which facilitated trade in low-tech textile,

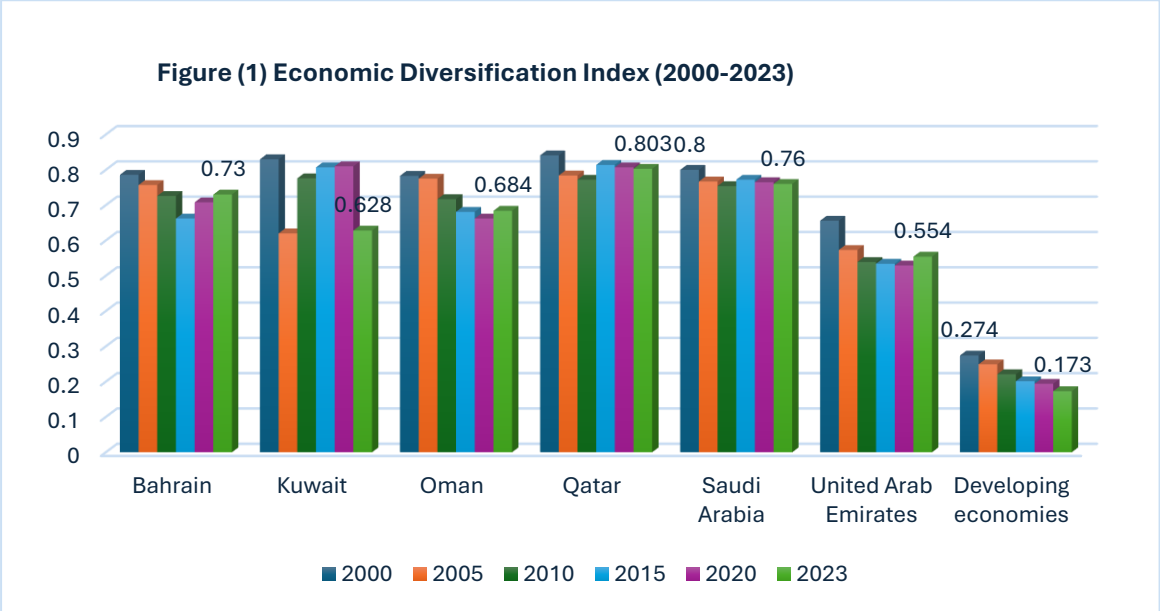
Through implementing sound fiscal policies and other incentives on the inputs used by exporters helped to promote the growth and development of Mauritius (Mosley, 2018). Later, the economy expanded horizontally even further to include business process outsourcing, financial services, tourism, and information technology (Zafar, 2011)

Adopting a diversification strategy requires the adoption of suitable macroeconomic and fiscal policies. For strategic plans to come into effect requires rent management to be conducted with transparency and sound governance. The capacity of governments to develop a comprehensive diversification strategy must be backed by a suitable policy mix supported by political and socioeconomic well (Lebdioui, 2022). While some countries like Malaysia and Mauritius, have had success diversifying their economies through exports, many others in Commodity Dependent Developing Countries have failed to pursuit its diversification path

2.3 Diversification performance through different measures

The next lines illustrate the performance of Economic diversification in GCC countries using different measures.

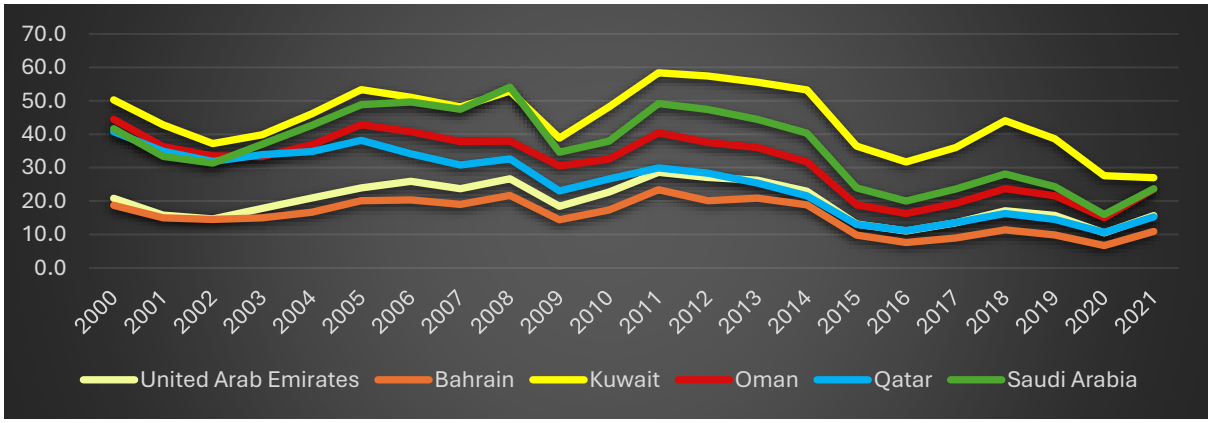
Figure (3) Economic Diversification Index (2000-2023)



Source: UNCTAD DATA CENTER

Figure (1) shows that EDI for developing economies has consistently been lower than that of the GCC countries, declined from 0.274 in 2000 to 0.173 in 2023 which means the developing countries is the proper path of diversification . While GCC counties still far beyond the desirable diversification especially for Saudi Arabia Qatar and with EDI 0.8 and 0.76 in 2023.

Figure (4) Oil rents % of GDP (2000-2021)

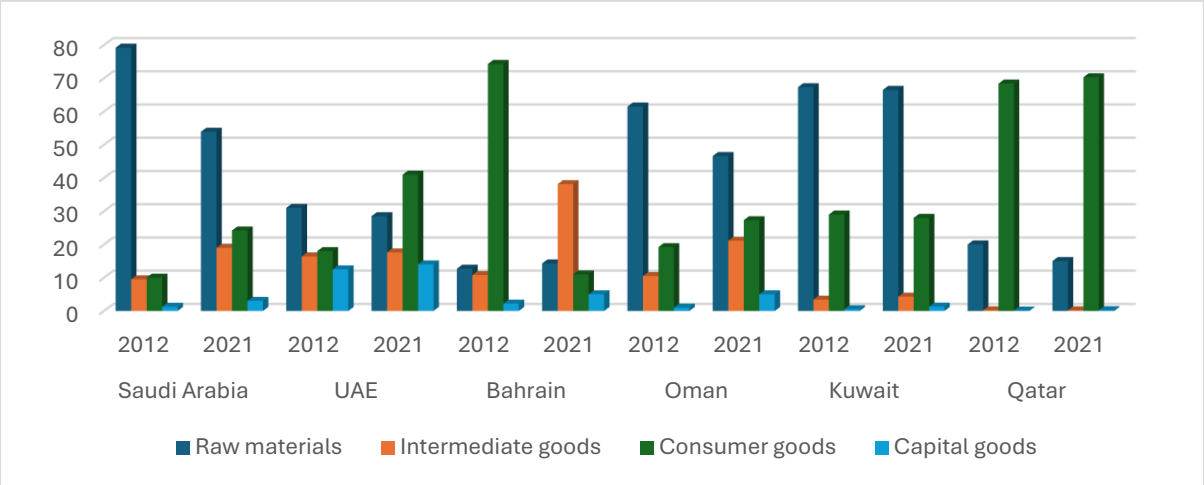


Source: world development indicators 2023

Even though oil rents still account for a significant percentage of GDP in the GCC, diversification is obviously a must, especially for UAE and Bahrain, where rent percentage of oil es are smaller. The general drop in contributions from oil rent after

2014 suggests that the region's economic policies may be changing. The figure (2) shows that Kuwait continually exhibits the largest reliance on oil rents. With a noteworthy peak of 50.3% in 2000, this shows a strong reliance on oil for economic stability. A significant contribution from oil rent is also shown by Saudi Arabia and Oman, where percentages range from 16.0% to 58.4% for Saudi Arabia and 15.0% to 44.5% for Oman. The percentage of oil rent has gradually decreased in both countries in recent years, which is indicative of larger attempts to diversify their economies. With oil rents ranging from 10.6% to 55.7%, Qatar continues to be heavily dependent on them. It does, however, exhibit a declining tendency in the later years, like those of its GCC counterparts, indicating a shift away from the oil sector. United Arab Emirates (UAE) and Bahrain have smaller oil rent contributions; the UAE ranges from 10.5% to 28.6%, while Bahrain has contributions from 6.7% to 23.4%. This suggests that these nations' economies are more diverse. However, the data shows that, starting in 2014, most GCC nations' contributions to oil rent decreased generally, in line with changes in the price of crude oil globally. The considerable reduction in oil prices during 2015 and 2016 is probably the reason for the decline's increased visibility during those years.

Figure (5) Exports of Product Groups (2011 vs 2021)(%)



Source: https://wits.worldbank.org

Figure (3) shows that Saudi Arabia has witnessed a significant decline in exports of raw material from 79.21% in 2011 to 53.9% in 2021 which indicates a shift towards diversifying exports beyond raw materials. While UAE: Exports of raw materials decreased slightly from 31% to 28.5%, suggesting a stable but slightly reduced. Bahrain surprisingly had an increase from 12.7% to 14.3% which indicates a growing focus on raw material exports. Oman followed a path a way form raw material that a drop from 61.5% to 46.6% suggests a shift in export strategy towards other goods. Kuwait had a slight decrease from 67.3% to 66.5% that shows no diversifying progress

in the last decade. Qatar achieved a decrease from 20% to 15% reflecting a shift towards diversification.

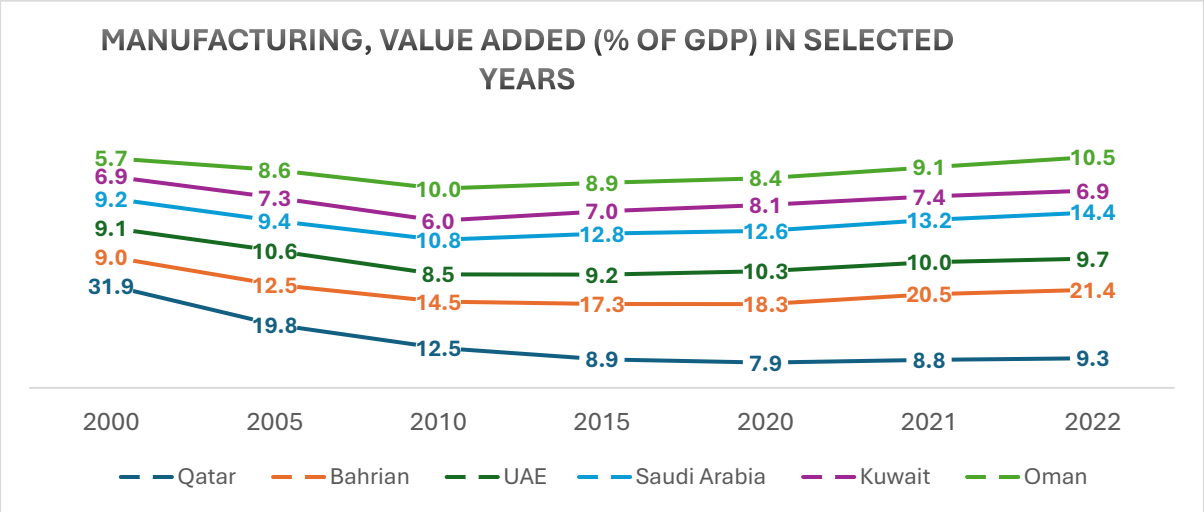
Table (1) Fuel exports (% of merchandise exports) Selected Years

	2000	2005	2010	2015	2020	2021	2022
Bahrain	40	78	74	50	30	52	43
Kuwait	94	95	93	92	93	95	96
Oman	83	92	78	76	64	65	74
Qatar	91	85	93	84	82	84	87
Saudi Arabia	92	91	88	78	68	77	77
United Arab Emirates	94	58	50	38	71	70	73

Source: world development indicators 2024

Table (1) reveals significant trends in the reliance on fuel exports. Bahrain shows a dramatic increase in fuel exports from 2000 to 2005, peaking at 78%. However, there has been a significant decline since then to reach 43% by 2022. Kuwait maintains a high and stable percentage of fuel exports, consistently around 92-96% over the years, indicating a strong reliance on fuel. Oman's fuel exports have decreased from a high of 92% in 2005 to 64% in 2020 but have shown a slight recovery in 2021 and 2022. Qatar has maintained a relatively stable percentage of fuel exports, fluctuating between 82% and 93%, indicating a strong but slightly reliance on fuel. Saudi Arabia shows a declining trend in fuel exports from 92% in 2000 to 68% in 2020, with a slight recovery in (2021 – 2022). UAE has seen a significant decline from 94% in 2000 to 38% in 2015, followed by a recovery to 71% in 2020 and stabilizing around 70-73% in (2021-2022). However, the data reflects a broader trend of diversification in the economies of the GCC countries, although hydrocarbons still play a dominant role in exports.

Figure (6) Manufacturing, value added (% of GDP) in selected years



Source: World Development Indicators 2023

Figure (4) shows that Qatar's manufacturing has seen a significant decline in its contribution to GDP, dropping from 31.9% in 2000 to 9.3% in 2022. This decline reflects a shift towards a more service-oriented economy, although there was a slight recovery from 7.9% in 2020 to 9.3% in 2022. Bahrain has experienced an increase rising from 9.0% in 2000 to 21.4% in 2022, indicating a successful diversification policy. UAE has remained relatively stable, with a slight increase from 9.1% in 2000 to 9.7% in 2022. Saudi Arabia has seen an increase rising from 9.2% in 2000 to 14.4% in 2022. This growth reflects the country's efforts to diversify its economy away from oil dependency. Kuwait kept its stagnant trend through the years. Oman a positive trend from 5.7% in 2000 to 10.5% in 2022. This growth suggests that Oman is successfully enhancing its manufacturing capabilities. However, data indicates the glaring existence of discrepancy of success in diversifying economies within the GCC, as some countries making significant progress while others face challenges in enhancing their manufacturing sectors. The decline in the industry's contribution to the GDP and the increase in the proportion of the service sector's added value to the GDP in can be attributable to the gradual shift of economic activity from industrial sectors to services ones (Beutel 2021).

3. Literature Review

3.1 Economic Diversification and Economic Growth

Economic diversification refers to the process by which an economy expands its range of activities across various sectors to reduce dependency on a limited number of industries or resources (Gelb,2010). However, Diversification is defined in a variety of ways according to the field of application (Hvidt, 2013).

Basile et al, (2018) conducted research of 114 countries (1992-2012), the research estimation results confirm that rich countries export more goods because their superior production technology enables them to penetrate the global markets. This could be a direct effect while the indirect through spatial spillovers strengthen the absolute technological advantage to export a greater variety of goods.

Export diversification is related to the stage of economic development, it could have a positive impact if the economy is less vulnerable to external shocks. Successful export diversification strategy is often accompanied with other fundamental factors (technology spillovers, diversification of investments, education, infrastructure, good governance, and market access).

On the other hand, studies show no impact of export diversification on economic growth. Alshomaly & Shawaqfeh (2020) found that the exports diversification of west Asian Arab countries (2000-2017) diverge clearly from the world diversification pattern since the exports of group countries is driven by a high degree of primary exports concentration. Economic growth in the group has been influenced positively

by human capital, primary products export growth, and the adoption of efficient anti-corruption policies, but it has been negatively influenced by trade openness and population growth. the exports of mining and low value-added goods constitute a large proportion of the export's structures in other Arab countries (Mdanat et al, 2018).

another study finds that the key factors which support export diversification are human capital accumulation inclusive of higher education, domestic investment, population, quality of institutions, quality of infrastructure and market access. Conversely, the factors that retard export diversification or increase export concentration are economic distance), openness to trade and declining terms of trade, foreign direct investment, exchange rate volatility and exchange rate overvaluation Murphy (2019).

Various measures have been developed to calculate an economy's export diversification. The concentration index which the inverse of economic diversification index serve as a measure in more than 80% of the econometric studies considered in this review. The primary concentration indices considered in the studies include the Herfindahl index (HI), Herfindahl-Hirchmann index (HHI), Gini index and Theil index (Hawaii, 2011; UN, 2016). Other less frequently used measures include variables based on export structure (i.e., horizontal and vertical diversification) and geographical markets. However, Export diversification can minimize export instability. According to Markowitz (1954) portfolio theory, the diversification could minimize risks associated with exporting a narrow range of products, also minimize the risks of individual price fluctuations (Love, 1992).

Numerous studies have tackled the impact of economic diversification and its relationship to economic growth. However, the results differed depending on the countries studied and the interval periods in addition to the methods used. Jagadeesh, (2018) This study aimed to find out the impact of export diversification on economic growth in 16 landlocked African countries, during the period from 2005 to 2015 using the (GMM) model. The results indicated that there is a significant negative relationship between export diversification and economic growth.
Following the structural change theories that developing countries should diversify their exports at all possible patterns to achieve sustainable economic growth (Cherney, 1979). Prebisch (1950) assumed that vertical diversification by adding more value to exported products contributes to reducing the deterioration of terms of trade.

3.2 Economic Diversification and Governance

Most of oil-rich Arab countries, have significant social and political turbulences that lead the region to be affected by either conflict or violence. As oil revenues fall and fossil fuel seems to fade by new climate changes initiatives, oil-rich Arab governments could face severe economic and social unrest that would plant the seeds of uncertainty

raising questions about Arab oil exporters' diversification capacity and their ability to create more jobs opportunities.

Looking at the oil rich countries that non-Arab ones, governance played an essential role in practicing good governance principles and sound institutions that enabled channelling their resources to a productive use (Joya, 2015). These countries managed to achieve economic diversification due to providing a supportive governance framework (six governance indices); voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption.

Unlike the traditional view in Eldarassi (2024) study to examine the extent to which higher quality governing substitute or complement economic diversification to promote macroeconomic stability in (MENA), reveals that economic concentration reduces volatility. Confirming that economic concentration lowers macroeconomic volatility, especially in countries with good governance.

Clearly the impact of good governance on economic diversification is a core focus. Which was empirically proven in many studies; Clark et al. (2016) examined the role of worldwide governance indicators in the different stages of diversification in 29 African countries for the 1963–2009 period using an OLS regression. The study concluded that political stability, regulatory quality and control of corruption are the most important in all stages of economic diversification. The study emphasis that diversification alone will not encourage development in poor countries until obstacles such as weak institutions, poor governance, corruption and poor infrastructure are clearly addressed. Same stream, Hendrix (2017) investigates the effect of governance on diversification for forty oil dependent economies during the period (2002–2012), where governance was positively associated with higher levels of diversification. Osakwe et al. (2018) find that good quality institutions positively affect the diversification prospects in Sub-Saharan African countries (1970–2010) by applying GMM method. Amiri et al. (2019) find that institutional quality contributes to efficient use of resource specially in the process of manufacturing sector and enhancing the level of economic diversification in 28 natural resource-rich countries (2000–2016) using (OLS) regression. Abdulahi et al. (2019) study uses rule of law as a threshold variable of institutional quality. Utilizes panel data of 14 resource-rich countries of sub-Saharan Africa. The results confirm a positive relationship between resource rent and economic growth when a country's institutional quality is above the threshold level of −1.28.

According to Rodrik (1996, 2004, 2014), successful economic development will involve producing new products with new technologies and shifting resources from traditional activities to new ones. The process of discovery of the economy's cost structure and identifying new products is called ''self-discovery'' introduced by Hausmann and Rodrik (2003).

3.3 Economic diversification and Human capital

Human capital encompasses the knowledge, skills, quality of education and health, plays a vital role in driving economic diversification. Countries with greater investment in human capital through education and healthcare can develop a skilled workforce capable of supporting moving to diversified economy.

Matallah (2024); Study the role innovation in accelerating economic diversification in 11 MENA oil-exporting countries (1996-2019) comparing to successfully diversified economies like Canada, Norway, using GMM. The research confirms that GCC countries' level of innovation crucial to accelerate the process of economic diversification, it is more rapidly than that of non-GCC countries. The findings also illustrate that MENA oil exporters' economic diversification seems to be positively and significantly influenced by other factors (governance, human development, credit to the private sector, and economic freedom). while oil rents only speed up the diversification if it is tandem with good governance. Innovation also can play another vital roll to compact the challenge of fossil fuel, technological **innovations** can facilitate the transition from fossil fuels to renewable energy (Keleher et al. 2022). It can bring new business models and paves the way for environmental sustainability by reducing dependence on fossil Abid et al. (2022) . Unfortunately, GCC countries spend a relatively small percentage of their GDP on research and development, thereby impeding the transfer of knowledge from foreign direct investment to domestic companies (Farole and Winkler 2014). Not only the spending on R& D but also the need to curb corruption. Innovation cannot take place in an environment characterized by widespread corruption, administrative laziness, nepotism, and mismanagement of oil revenues (Movchan et al. 2017).

Human capital can be very crucial factor in attracting FDI. However, FDI have a significant impact on export diversification, as FDI supports higher productivity and contributes to export diversification only when the host country has a minimum threshold human capital to allow for sufficient absorptive capability of the advanced technologies within the host economy (Alemu, 2008).

4. Data and Methodology

4.1 Data

The study employed a time series data (2000-2023), to measure the impact of human capital measured by mean years of schooling, governance average index, oil rents and uncertainty index on Economic diversification.

Table (2) Data and sources

Variable	Notation	Sources
Dependent variable	**EDI**	**UNCTAD**

Economic Diversification		
Independent Variables		
Governance	**Gi**	**WGI-WB 1996**
Economic Uncertainty	**EU**	**WUI**
Oil rents	Oil rents	**WDI**
Human Capital	**Meen years of schooling (MYS)**	**UNDP**

4.2 Model specification

The research uses the methodology of panel data analysis, both long and short run models because it permits to identify certain parameters and produce more efficient outcomes from the estimations. When compared to time series and cross-section analyses, panel studies are more powerful in reducing the identification problems in the presence of endogenous variables and measurement problems. These results would be higher quality outcomes in terms of robustness to omitted variables and individual dynamics (Baltagi, 2005).

The ARDL specification is formulated as follows (Loayza and Ranciere, 2006)

$$Y_{it} = \sum_{j=1}^{p-1} \gamma_y^i (y_i)_{t-j} + \sum_{j=0}^{q-1} \delta_y^i (X_i)_{t-j} + \varphi^i [y_i)_{t-1} + \mu_i + \varepsilon_{it}$$

Where $X_{i,t-j}$*the (k x 1) is* vector of explanatory variables for group i and μ_i represents the fixed effect. In principle, the panel can be unbalanced, and p and q may vary across countries. This model can be reparametrised as a VECM system:

$$\Delta Y_{it} = \theta_i (Y_{i,t-1} - \beta_i X_{i,t-1}) + \sum_{j=1}^{p-1} \gamma_y^i \Delta Y_{i,t-j} + \sum_{j=0}^{q-1} \delta_y^i \Delta (X_i)_{t-j} + \mu_i + \varepsilon_{it}$$

Where the β_i are the long-run parameters andθ_i; are the equilibrium (or error)-correction parameters. The pooled mean group restriction is that the elements of β are common across countries:

$$\Delta y_{it} = \theta_i (Y_{i,t-1} - \beta_i X_{i,t-1}) + \sum_{j=1}^{p-1} \gamma_y^i \Delta (Y_i)_{t-j} + \sum_{j=0}^{q-1} \delta_y^i \Delta (X_i)_{t-j} + \mu_i + \varepsilon_{it}$$

5. Results

Table (3) presents the results of unit root tests, which suggest that most of the variables under consideration are stationary of order I(1) while integrated of order I (0). Due to these mixed orders of integration, panel ARDL approach rather than the traditional panel cointegration test is appropriate.

Table (3) : Unit root test

Variable	Level (p-value)	First Difference (p-value)	Level of Integration
DIV	0.0174**	--	I(0)
GI	0.5265	0.0000**	I(1)
MYS	0.0641	0.0003**	I(1)

OILRENT	0.1641	0.0000**	I(1)
UNCERTAINTY	0.0007**	---	I(0)

Table(4) : Panel ARDL results

Long Run Results				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
UNCERTAINITY	0.002203	0.000576	3.823622	0.0002
MYS	-0.025597	0.003064	-8.353128	0.0000
GI	0.032293	0.032083	1.006565	0.3165
OILRENT	-0.002575	0.000635	-4.055467	0.0001
Short Run Results				
COINTEQ01	**-0.490138**	0.122456	-4.002566	**0.0001**
D(UNCERTAINITY)	-0.000333	0.000617	-0.540563	0.5900
D(MYS)	0.019968	0.015890	1.256580	0.2118
D(GI)	-0.074125	0.069069	-1.073208	0.2857
D(OILRENT)	0.000474	0.000646	0.733577	0.4649
C	0.453393	0.118381	3.829936	0.0002

In the long run

1. **Uncertainty**: The positive and statistically significant coefficient (0.002203, p = 0.0002) indicates that an increase in uncertainty is associated with an increase in concentration, (i.e. a decrease in economic diversification, in the long run.
2. **Mean Years of Schooling (MYS)**: The negative coefficient (-0.025597, p = 0.0000) is significant, implying that higher educational attainment tends to decrease concentration. an increase in economic diversification, in the long run.
3. **Governance Index (GI)**: The coefficient (0.032293, p = 0.3165) is positive but not statistically significant, suggesting that improvements in governance do not have a clear long-run impact on diversification.
4. **Oil Rent**: The significant negative coefficient (-0.002575, p = 0.0001) highlights that higher oil rents decrease concentration. increase in economic diversification, in the long run.

In the short run:

- **Uncertainty**: The coefficient is negative but insignificant (-0.000333, p = 0.5900), suggesting that uncertainty does not influence economic diversification in the short term.
- **Mean Years of Schooling (MYS)**: The positive but insignificant coefficient (0.019968, p = 0.2118) implies no short-term effect of education on diversification.
- **Governance Index (GI)**: The negative and insignificant coefficient (-0.074125, p = 0.2857) indicates no clear short-term impact of governance on diversification.
- **Oil Rent**: The positive but insignificant coefficient (0.000474, p = 0.4649) shows no short-term relationship between oil rents and diversification.

- The coefficient of the error correction term (COINTEQ01) is negative and significant (-0.490138, p = 0.0001), confirming the validity of the long-run relationship. This indicates a significant speed of adjustment, where about 49% of any deviation from the long-run equilibrium is corrected each period.

In summary, the long-run coefficients point to strong, significant relationships, particularly for Uncertainty, MYS, and Oil Rent. In the short run, the error correction mechanism is functioning efficiently, but individual short-term changes in the explanatory variables show statistical insignificance.

5. ***Conclusion***

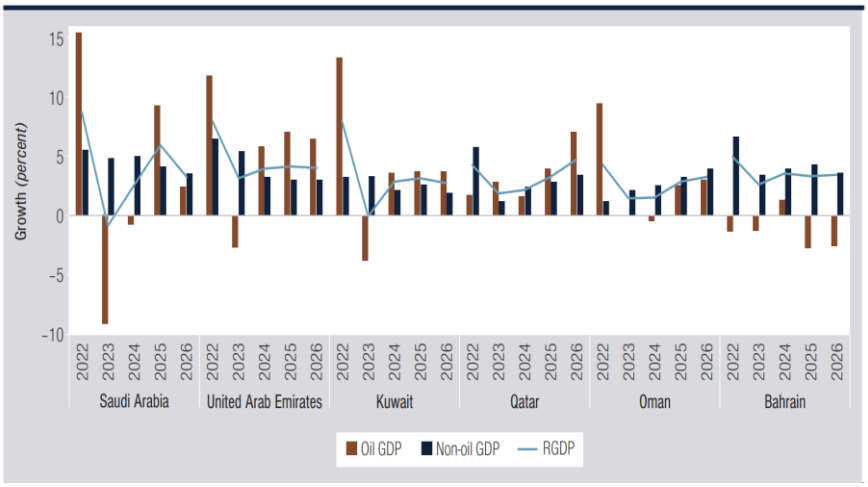
Clearly Oil Sector will continue to be the dominate sector for the GCC countries, however, it needs to play a more active role in the diversification process. The oil sector face two challenges; this source of income is unstable due to the fluctuation in oil prices beside oil industry is capital-intensive and does not generate enough jobs for the new labour force. The research reveals that Uncertainty *and Governance Index have a positive and statistically significant, the results were consistent with (Matallah, 2022) . While Mean Years of Schooling and oil rents have a negative significant impact on economic diversification (Matallah 2020) in the long run; Uncertainty and Governance Index have both negative but insignificant influence on economic diversification while Mean Years of Schooling and oil rents both have positive but insignificant effect of education on diversification.*

The inclusion in national visions of the GCC countries of the objective of economic diversification is a critical step towards preparing their economies for the post-oil era. Consequently, the GCC adheres to policies that encourage the development of sectors such as finance, education, tourism, manufacturing, research and development, and technology. In addition, the GCC countries are trying to transform their economies into knowledge-based economies, as technological development is seen as a driving force for economic growth in modern economies. The study concluded that GCC countries are still dependent on hydrocarbon revenues despite their economic diversification policies.

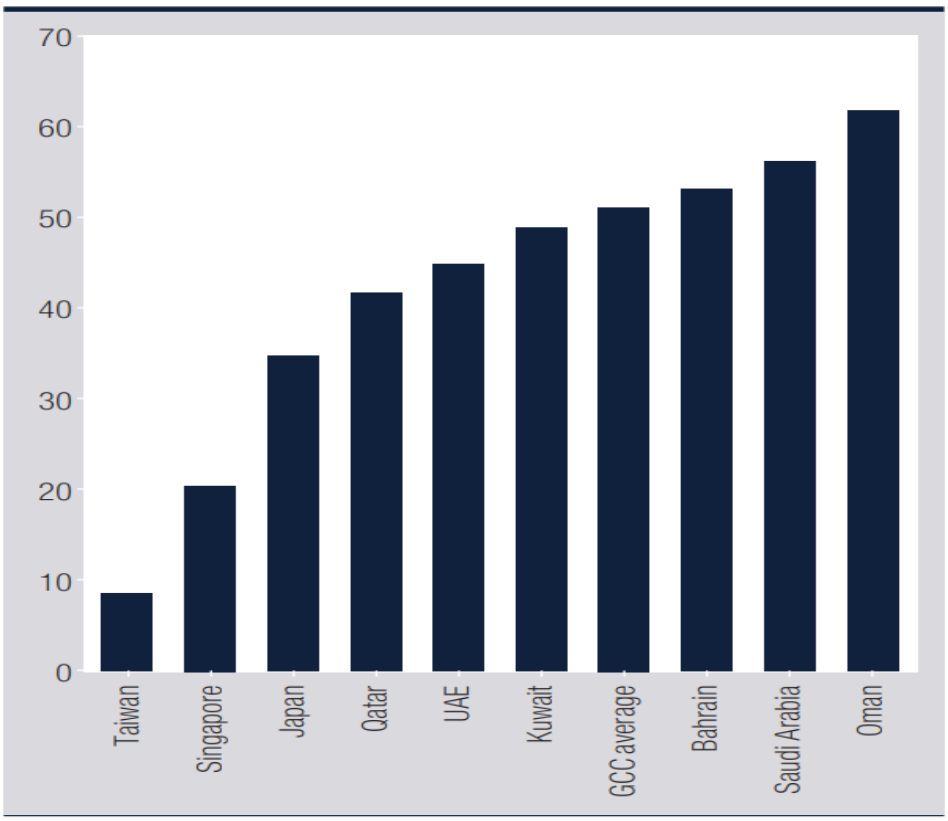
6 .Policy Recommendation

1- Oil price will be a dominant factor even with the highly volatile price due to the uncertainties of the economic and political disruptions. It affects investor confidence and influencing foreign direct investment. It is estimated that a 10 percent negative/positive shock on oil price will reduce/increase regional GDP growth by 0.6 percentage point, fiscal balance by 1.8 % of GDP, and current account balance by 1.5 % of GDP (WB-Gulf economic report 2024).This entails the countries have to diversify their economies away from oil and take a significant steps for diversification , with a crucial need to sustain and accelerate the pace of reforms.

2- Rebound in GDP growth rates supported by Non-oil Sectors has a become an essential factor for the next generation .



3- The insufficient quality of education in these countries is driven by several factors including outdated instructional and pedagogical practices, limited school readiness, and less emphasis on learning. The graph below shows Share of grade eight students asked to memorize facts/principles by their science teachers. Which is confirming the research results of the need to educational reform (modern methods of teaching and learning, which emphasize critical thinking).



Source: TIMSS 2019 data

4- Human capital is a key element to increasing economic growth in the long run, but all its potential contribution will not be fully released until quality of education in improved. Unfortunately, GCC economics for example suffer from e low quality of education as child born today in the GCC is expected to reach only 62 percent of his/her full potential productivity. GCC countries are performing well in two out of the three dimensions of Human capital Index (child survival and adult survival, exception is education). These countries lose on average, 4.1 years of learning.

5- Leverage the power of learning assessments to make sure that all students are learning, countries must undergo the international learning assessments to make sure that it helps them to measure overall learning progress against international benchmarks, while also providing points of comparison with other countries.

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Appendix

Results for Countries Specified in short term

6- Bahrain

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.404347	0.014342	-28.19239	0.0001
D(UNCERTAINITY)	-0.000329	2.78E-07	-1182.411	0.0000
D(MYS)	0.001842	0.000329	5.605271	0.0112
D(GI)	0.033299	0.001678	19.84985	0.0003
D(OILRENT)	0.002610	1.16E-06	2244.979	0.0000
C	0.368419	0.011918	30.91192	0.0001

Kuwait

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.847237	0.052193	-16.23287	0.0005
D(UNCERTAINITY)	0.002439	2.51E-06	973.5572	0.0000
D(MYS)	0.095030	0.003261	29.13967	0.0001
D(GI)	-0.409166	0.031595	-12.95018	0.0010
D(OILRENT)	-0.000152	2.07E-06	-73.09959	0.0000
C	0.827071	0.052710	15.69106	0.0006

3- Oman

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.766180	0.026146	-29.30405	0.0001
D(UNCERTAINITY)	-0.000984	2.61E-07	-3772.584	0.0000
D(MYS)	0.020558	0.000453	45.33346	0.0000
D(GI)	-0.074952	0.001716	-43.68986	0.0000
D(OILRENT)	0.001394	4.76E-07	2926.330	0.0000
C	0.724204	0.022444	32.26675	0.0001

4- Qatar

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.366927	0.014480	-25.34067	0.0001
D(UNCERTAINITY)	-0.001885	3.15E-07	-5989.131	0.0000
D(MYS)	0.011963	0.000170	70.48112	0.0000
D(GI)	0.001811	0.001175	1.541738	0.2208
D(OILRENT)	-0.001653	7.35E-07	-2247.462	0.0000
C	0.366451	0.015429	23.75048	0.0002

4-

5- United Arab of Emirates

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.536578	0.014921	-35.96230	0.0000
D(UNCERTAINITY)	-0.001227	1.70E-07	-7196.338	0.0000

D(MYS)	-0.017475	0.000164	-106.2474	0.0000
D(GI)	-0.028912	0.001128	-25.63066	0.0001
D(OILRENT)	0.001364	4.67E-07	2921.168	0.0000
C	0.418362	0.011981	34.91885	0.0001

6- Saudi Arabia

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.019557	0.012605	-1.551560	0.2186
D(UNCERTAINITY)	-1.59E-05	7.65E-08	-207.5185	0.0000
D(MYS)	0.007887	0.000618	12.75757	0.0010
D(GI)	0.033167	0.000887	37.39015	0.0000
D(OILRENT)	-0.000718	1.16E-07	-6167.539	0.0000
C	0.015850	0.013342	1.188004	0.3203