The Role of Imports on the Divergence of the Saudi Arabian Economy from an Oil Based Economy

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ÖZ

Suudi Arabistan'ın, ithalatı ile Kişi Başına Reel GSYİH'sı ve Reel GSYİH'sı arasındaki nedensellik ilişkilerini araştırmayı amaçlayan bu makale, araştırılan bu değişkenlerin Suudi Arabistan'ın petrol bağımlı bir ekonomiden daha rekabetçi bir ekonomiye geçişini nasıl etkilediğine odaklanmaktadır. 1968-2022 yılları arasındaki veriler kullanılarak, Reel GSYİH, Kişi Başına Reel GSYİH ve temel makroekonomik göstergeler arasındaki bağlantıları inceleyen zaman serisi analizi gerçekleştirilmiştir. Araştırma sonuçları, ithalatın hem Reel GSYİH hem de Kişi Başına Reel GSYİH üzerinde istatistiksel olarak anlamlı ve pozitif bir etkiye sahip olduğunu ortaya koymuştur. Analiz sonuçları, bu değişkenlerin Suudi ekonomisinin rekabet gücünün artmasına katkı sağladığına işaret etmektedir.

ABSTRACT

This paper investigates the causal relationships between imports and both Real GDP per capita and Real GDP, focusing on how these variables influence Saudi Arabia's transition from an oil-dependent economy to a more competitive one. Using data from 1968 to 2022, we conducted a time series analysis to explore the interconnections between Real GDP, Real GDP per capita, and key macroeconomic indicators. The analysis underscores the contribution of these variables to the Saudi economy's shift toward increased competitiveness. The results reveal that imports have a significant and positive effect on both Real GDP and Real GDP per capita, highlighting their crucial role in driving the economy towards greater competitiveness.

1. Introduction

Oil has continued to profoundly impact Saudi Arabia's economy since its discovery in 1938 and the establishment of the petroleum industry. The founder of Saudi Arabia, King Abdul Aziz Al-Saud, aimed to modernize the economy through major restructuring before the oil discovery. Despite unchanged economic philosophies of successive rulers since King Abdul Aziz Al-Saud's reign, the government's economic role has expanded over time (Sohail, 2012).

In 2022, Saudi Arabia, with a population of approximately 36.4 million people, achieved a GDP of USD $1,108.57 billion and a Growth Domestic Product (GDP) per capita of USD $30,448, alongside an unemployment rate of 5.59 percent. The industrial sector contributed significantly to the

GDP, totaling USD $160.03 billion, with imports at USD $258.21 billion (23.29% of GDP) and exports at USD $445.88 billion (40.22% of GDP), resulting in a trade surplus of USD $187.67 billion (16.93% of GDP). These economic indicators underscore Saudi Arabia's position as a key player in the global economy, largely driven by its oil exports and strategic economic policies.

Saudi Arabia, as the world's largest oil exporter and a member of the G20 nations, derives 90 percent of its revenues from oil (Nurunnabi, 2017). However, recognizing the volatility and environmental concerns associated with oil dependency, the Saudi government has embarked on ambitious economic diversification efforts under Vision 2030. This initiative aims to reduce the country's reliance on oil revenues and promote sustainable economic growth across various sectors. The purpose of this paper is to examine the cause-and-effect relationships between imports on both Real GDP per Capita and Real GDP, and how this variable influences the Saudi Arabian economy's progression towards a competitive economy and away from an oil-based economy. This paper will also shed light and give recommendations to policy makers on how to move the Saudi Arabian economy into a more competitive state. The motivation for this study stems from Saudi Arabia's prominent role in the Middle East and its impressive economic growth. Over recent years, Saudi Arabia has emerged as a key player in the regional economy, often being seen as the next economic boom hub in the Gulf region after the United Arab Emirates (El Amine, 2023). This potential for substantial economic development makes it crucial to understand the underlying factors driving this growth. This paper will further investigate the cause-and-effect relationship of both exports and the manufacturing sector output on real GDP and GDP per capita for Saudi Arabia. However, since exports and manufacturing output of Saudi Arabia are primarily dominated by oil and/or related products (Foudeh, 2017), they will be overlooked. Special focus will be shed on imports since they are both a component of a competitive economy and may pave the way to manufacturing diversification of Saudi Arabia (Schwab, 2019). In its current status in the manufacturing sector, it will be hard to increase exports of manufacturing products and move away from its independence on oil (Ramady, 2010). Nevertheless, it will be easier to import machinery, advanced technologies, raw materials and other protective equipment that will eventually lead to more efficient manufacturing and service sectors and stronger competitiveness of Saudi exports.

Development is an ongoing process fueled by resources and entrepreneurial acumen. The industrialization of an economy ensures sustainable growth and contributes significantly to its overall economic strength. Comprehensive growth across all manufacturing sectors accelerates this development. Industrialization encompasses the transformation of processes involved in converting inputs into finished products or services (Ali, 2020). Industrial development is crucial for Saudi Arabia's economic transformation, effectively utilizing human resources and integrating them into the national economy. Over the past four decades, Saudi Arabia has witnessed rapid industrialization, albeit with varying sectoral performances influenced by both internal policies and global economic factors (Ali, 2020). Saudi Arabia's industrial exports have also experienced notable growth, rising by 9.3%. Chemical and plastic products constitute a significant portion of Saudi Arabia's non-oil industrial exports, demonstrating robust expansion from 1995 to 2017 (Ali, 2020). Initiatives such as the Saudi Industrial Development Fund and the National Industrial Development and Logistics Program highlight the government's commitment to bolstering the industrial sector, aiming for a balanced economic contribution beyond oil revenues.

The manufacturing sector in Saudi Arabia has experienced notable growth, with industries like minerals and natural resources thriving, while others, such as food production, face challenges despite supportive frameworks (Ali, 2020). The sector's contribution to GDP has increased significantly, reflecting a broader economic diversification strategy. Non-oil manufacturing industries have expanded significantly, indicating their growing importance in Saudi Arabia's economic landscape and their potential to further enhance economic resilience.

Economic diversification is crucial for achieving sustainable economic growth. Economies heavily reliant on a single natural resource face risks of instability or collapse if the global market price of that commodity drops. Furthermore, diversification supports job creation, combats corruption, and enhances institutional quality. Since 1970, the Saudi government has implemented ten five-year development plans, all emphasizing economic diversification (Albassam, 2015).

Despite these strides, challenges persist, particularly in optimizing the business environment and fostering private sector growth. Government policies play a pivotal role in shaping the business landscape, influencing factors such as regulatory frameworks, infrastructure development, and public services delivery (Rahman et al., 2018). Effective governance at both national and regional levels is essential for ensuring a conducive environment for businesses and fostering competitiveness across different regions of the Kingdom.

In Saudi Arabia, much like in other nations, decisions made at the regional level significantly shape the business climate and determine local competitiveness. Businesses engage regularly with various local authorities as they operate within their respective environments. Although laws and regulations are typically formulated centrally, their implementation varies widely across provinces. Understanding how businesses interact with local government entities is crucial for assessing growth potential, as is recognizing the varying quality of local administration across different regions of the Kingdom. (Rahman et al., 2018).

Understanding these dynamics is critical for policymakers, investors, and stakeholders interested in Saudi Arabia's economic stability and growth potential. Analyzing factors such as exports, imports, and manufacturing sector output provides insights into Saudi Arabia's economic transition and its journey towards becoming a more competitive economy. This transition aligns with global competitiveness indices, where Saudi Arabia has made significant strides, albeit with room for improvement in areas such as infrastructure, innovation capability, and institutional reforms (Schwab, 2019). In the Global Competitiveness Index of 2019, Saudi Arabia achieved a ranking of 36th with a score of 70.0, marking an improvement of 3 places from the previous year along with a score increase of 2.5 points (Schwab, 2019: 15).

In summary, Saudi Arabia's economic trajectory underscores the country's resilience and adaptability in a global economic landscape shaped by industrialization and diversification efforts. Continued strategic investments and policy reforms are crucial for sustaining growth momentum, reducing dependence on oil revenues, and fostering a diversified, competitive economy poised for sustainable development in the years ahead.

The paper is organized as follows: First, the theoretical framework will discuss the various theories used to study the relationships between the variables. Next, the literature review will examine the relevant literature for this study. The data and methodology section will detail the statistical analysis methods used. Following this, the results section will present the outcomes of the statistical analysis, and a discussion section will proceed analyzing the results. Finally, the conclusion will summarize the findings and their implications.

2. Theoretical Framework

2.1. Keynesian Model

The Keynesian model provides a foundational framework for understanding how aggregate demand drives economic output and employment. The basic GDP equation in the Keynesian model is:

GDP = C+I(r)+G(t)+(X−M)

Where:

- C is consumption.
- I(r) represents investment, influenced by the interest rate r.
- G(t) stands for government spending net of taxes t.
- X signifies exports.
- M represents imports.

This equation shows how various components contribute to GDP, highlighting the linear relationship between GDP and these variables. Furthermore, the Keynesian model is often used to explain short-term economic fluctuations and the role of government intervention in stabilizing the economy (Samuelson and Nordhaus, 2010, p386).

2.2. Sectoral Contribution to GDP

The Keynesian model also allows for the disaggregation of GDP by sector, which can be represented as:

GDP = a+m+s

Where:

- a denotes the value added from the agricultural sector.
- m represents the value added from the manufacturing sector.
- s stands for the value added from the services sector.

This equation illustrates how GDP is composed of contributions from different sectors of the economy, reflecting the structure of economic activity. The linear relationship among these components indicates that changes in any of these sectors will directly affect the overall GDP. For economies like Saudi Arabia, which are transitioning from oil dependence, understanding the contributions of different sectors is crucial for policy-making and economic planning (Blanchard, 2009).

2.3. Endogenous Growth Model

The endogenous growth model extends the Keynesian framework by emphasizing the role of internal factors in driving long-term economic growth. The basic form of the endogenous growth model is:

$$Y = AK^{\alpha}L^{1-\alpha}$$

Where:

- Y is output (GDP).
- A represents technology or total factor productivity.
- K is the capital stock.
- L is the labor force.
- α is the output elasticity of capital.

The growth rate of technology A is often modeled as:

$$\frac{dA}{dT} = \delta AH$$

Where:

- H is human capital.
- δ is the rate of return on investment in human capital.

Endogenous growth theory suggests that investments in human capital, innovation, and knowledge can lead to

sustained economic growth. This theory is particularly relevant for economies seeking to diversify and develop new competitive sectors, as it highlights the importance of fostering innovation and productivity improvements from within the economy (Romer, 1990; Grossman and Helpman, 1991).

2.4. Hypotheses

Building on the Keynesian and endogenous growth models, as well as the sectoral contributions to GDP, the following hypotheses are proposed:

- H1: Imports have a positive and significant effect on Real GDP in Saudi Arabia.
  - Null Hypothesis (H0): Imports do not have a positive and significant effect on Real GDP in Saudi Arabia.
- H2: Imports have a positive and significant effect on Real GDP per capita in Saudi Arabia.
  - Null Hypothesis (H0): Imports do not have a positive and significant effect on Real GDP per capita in Saudi Arabia.
- H3: The increase in imports has contributed to Saudi Arabia's transition from an oil-dependent economy to a more competitive one.
  - Null Hypothesis (H0): The increase in imports has not contributed to Saudi Arabia's transition from an oil-dependent economy to a more competitive one.
- H4: The contributions of the manufacturing sector are positively correlated with GDP growth in Saudi Arabia.
  - Null Hypothesis (H0): The contributions of the manufacturing sector are not positively correlated with GDP growth in Saudi Arabia.
- H5: There is a long-term equilibrium relationship between imports, Real GDP, Real GDP per capita, and sectoral contributions in Saudi Arabia.
  - Null Hypothesis (H0): There is no long-term equilibrium relationship between imports, Real GDP, Real GDP per capita, and sectoral contributions in Saudi Arabia.

3. Literature Review

A number of researchers discussed the path that the Saudi Arabian economy has to follow in order to move towards a competitive economy or a more efficient and productive economy.

Lashitew et al. (2021) reviewed recent evidence and identified empirical trends in the economic diversification of the rich-resources countries. Diversification was assessed by the growth of per capita non-resource (manufacturing and services) sectors in domestic and export markets, offering a clearer interpretation than other measures. This metric was used to evaluate the long-term diversification of countries that began as resource-dependent and ranked them based on their performance. The paper then identified policy-relevant factors associated with diversification at the national level, including the acquisition of human capital, public and

intellectual capital, and firm dynamism. More resource-dependent countries tend to perform worse in terms of human and intellectual capital, while more resource-abundant countries perform better in public capital and human capital accumulation. The study explored the mechanisms behind diversification performance through detailed case studies of Oman, Laos, and Indonesia.

Abu-Rashed et al. (2020) explored the role of business intelligence in creating a better knowledge-based economy in Saudi Arabia. The paper identified seven major issues that will converge the Saudi Arabian economy to a more knowledge-based and innovative economy. These issues, if addressed by policy makers, will aid the economy to move away from its dependence on oil and closer to a knowledge-based economy. The government's ambitious vision to transform the economy from an oil-based economy can thus be achieved.

Ali (2020) examined the historical evolution and recent trends of both successful and struggling industries in Saudi Arabia. The small manufacturing enterprises in the country are particularly underdeveloped and require focused attention to achieve sustainable growth through increased establishment numbers. Industries such as tobacco, computers, electronics, optics, pharmaceuticals, and transport equipment are identified as underprivileged and in need of support within the manufacturing sector. Facilitating access to credit is recommended to aid the development of these industries. To foster sustainable growth in Saudi Arabia's manufacturing sector, essential measures include government support for underdeveloped industries, favorable labor regulations, promotion of entrepreneurship, and provision of technical and financial assistance. Advancing the manufacturing sector aligns with Saudi Arabia's Vision 2030 goals, contributing significantly to national objectives.

Mlaabdal et al (2020) aimed to explore scientific methodologies for assessing the impact of oil price fluctuations on the economic growth of exporting countries and to evaluate the interaction between national economic growth and factors within the oil industry. To investigate the cointegration and causal relationships in national economic development, the paper adopts a two-pronged approach. Firstly, it utilizes a heterogeneously modified OLS (FMOLS) model to establish a linear relationship between economic development indicators (such as GDP, capital, and labor costs) and national economic performance indicators (including oil production volumes and rent payments for oil). Secondly, causal links between national economic growth, oil production volumes, and rent payments are analyzed using the Granger method within a vector error correction model (VECM). This method adjusts short-term dynamics based on identified long-term relationships between variables and their deviations. The study's findings on cointegration and causal relationships between the oil industry's development and national economies indicate that increased oil production and higher

levels of rent payments boost GDP growth in OPEC countries and high- to middle-income nations. Conversely, for countries with lower income levels, a 10% rise in oil production correlates with a mere 0.2% increase in GDP, suggesting limited economic benefits. This scenario is attributed to inadequate modernization of the industry and underscores the need for a shift in state regulatory frameworks governing oil exploration and production, towards promoting intensive development aimed at higher value-added products.

Bergholt and Seneca (2019) addressed the decline of oil prices by developing and applying a two-country New Keynesian model to analyze the implications of oil price shocks specifically for Norway, a prominent exporter of petroleum. Within this framework, mainland Norway, distinct from its offshore oil industry, is interconnected through domestic supply chains. Meanwhile, fiscal authorities manage income accumulation through a sovereign wealth fund, and oil prices and the international business cycle are interdependent abroad. This setup allows us to dissect the fundamental causes of oil price fluctuations and their impact on mainland Norway. Our model yields three principal findings. Firstly, movements in oil prices significantly contribute to macroeconomic fluctuations in mainland Norway. Secondly, while the dynamics differ across various shocks, traditional trade channels play a relatively less pivotal role in transmitting global shocks to oil-exporting countries compared to oil-importing nations. Thirdly, the domestic oil industry's supply chain emerges as a crucial conduit for transmitting oil price movements, while Norway's fiscal regime provides substantial insulation against external economic shocks.

Rahman et al. (2018) employed the Provincial Competitiveness Index (PCI). The PCI is aimed at benchmarking and comparing competitiveness levels across the Kingdom's thirteen provinces. A sophisticated, multifaceted research strategy was employed to collect the hard and soft data used to construct the index. The PCI sample consisted of over 4,100 micro-, small-, and medium-sized enterprises (MSMEs). The PCI scores reflected large disparities in competitiveness among provinces. The outcome suggested that local authorities in the more densely populated and commercial provinces are taking more pragmatic roles in promoting business environments conducive to investment than are authorities in the less densely and commercially populated provinces. Across the 10 subindices, the rankings demonstrate a significant level of variation in province performance across the different competitiveness dimensions. The PCI thus provides a powerful tool to aid Saudi Arabia's policy makers in promoting competitiveness and diagnosing the key constraints to private sector development and growth at the subnational level.

Nurunnabi (2017) studied the transition of a Saudi economy from an oil-based economy to a knowledge-based economy. The paper evaluated how the knowledge economy manifests today and the different policies that can be implemented to converge into a knowledge-based economy. The results indicate that there are six key aspects needed to be considered in developing Saudi Arabia's knowledge economy: human capital, innovation, information and communications technology (ICT), the economy, education and employment. The Saudi government's Vision and the related National Transformation Program both emphasize the necessity of diversifying the economy through development of the knowledge economy.

Ewers (2016) investigated the labor and human capital aspects of diversification and structural change in oil-dependent economies, focusing specifically on the UAE and other Arab Gulf States. It explored how oil-driven development in the Gulf has established entrenched employment and migration patterns that have hindered these countries' efforts to transition to more sustainable, post-oil economies. Using a mixed methods approach that includes secondary data analysis and a survey of 300 firms, the study examined the evolution of these distortions as the region has undertaken significant diversification initiatives over the past forty years. Although oil wealth has provided Gulf economies with the capital to develop competitive new sources of economic growth, the challenge of sustaining these efforts by locally reproducing the labor force in non-oil industries persists.

Albassam (2015) evaluated the government's diversification efforts using four metrics: the oil sector's contribution to GDP, the private sector's share of GDP, oil exports as a percentage of total exports, and oil revenues as a percentage of total revenues. Covering nine development plans from 1970 to 2013, the analysis reveals that despite over four decades of efforts, oil remains the primary driver of the Saudi economy. Therefore, the Saudi government must fully embrace economic diversification as a strategy for improved governance.

Anyaehie and Areji (2015) discussed Nigeria's primary focus on extracting oil for export. Nigeria's economy is heavily reliant on oil as a single commodity, but the revenue generated is not effectively invested in diversifying the economy to create a robust and stable system. This issue is compounded by socio-political challenges, including individual interests and poor socioeconomic orientations, which hinder industrialization efforts. As a result, the nation faces economic and socio-political instability, struggling to meet the basic needs of its population and accommodate a broad spectrum of people. To achieve economic diversification, Nigeria must pragmatically tackle the challenges of inadequate industrialization.

Satti Osman Mohamed Nour (2014) explored the challenges and opportunities associated with transitioning to a knowledge-based economy in the Arab region. Utilizing both descriptive and comparative methods, it employs the commonly accepted international framework and definition of a "knowledge-based economy" to analyze these challenges and opportunities. The study's findings support

the hypothesis regarding the significant hurdles and potential for this transition in the Arab region. The process is significantly hindered by various political, social, economic, institutional, and organizational barriers. Addressing these major obstacles will require a fundamental shift in the economic structure, moving from natural resource-dependent (oil) economies to knowledge-based economies in the Arab region.

Hamdi and Sbia (2013) aimed to conduct a thorough empirical investigation into the dynamic interrelationships between oil revenues, government spending, and economic growth within the Kingdom of Bahrain. Oil revenues play a crucial role in financing both government expenditures and the importation of goods and services. The recent rise in oil prices has notably increased public investments in social and economic infrastructure. The paper specifically explored whether the substantial increase in government spending has effectively accelerated the pace of economic growth. To achieve their objective, they employed advanced statistical techniques such as multivariate cointegration analysis and an error-correction model, utilizing data spanning from 1960 to 2010. The findings suggested that oil revenues continue to serve as the primary driver of economic growth in Bahrain, serving as the predominant channel through which government expenditures are financed. This underscores the significant influence of oil revenues on economic dynamics within the country, particularly in terms of sustaining public spending levels and supporting broader economic activities.

Hvidt (2013) examined using an empirical and comparative approach the historical and future trends of economic diversification efforts in the six Gulf Cooperation Council (GCC) countries. By employing content analysis, the paper explored potential future diversification trends based on current development plans and national visions issued by GCC governments. The historical record showed only modest success in diversification efforts. Nonetheless, current development plans unanimously highlighted diversification as crucial for ensuring future income stability and sustainability. Although state leadership remains predominant, diversification requires revitalizing the private sector and implementing broader reforms. The paper, however, raised doubts about the feasibility of these diversification plans being realized. Structural barriers to diversification included global economic growth scenarios, duplication of economic activities among GCC states, and significant obstacles to interregional trade.

Sohail (2012) discussed the need for improving the competitiveness of the Saudi Arabian economy in order to experience sustainable economic growth through the diversification of the economy. He argued that this vision was initiated by the founder of the Saudi State, King Adul Aziz Al Saud. His successors continued implementing the same philosophy in spite of an increase in the government role.

Gelb (2010) studied the process of diversification, where developing countries collectively have achieved notable success in diversifying their economies and export compositions. This diversification has taken various forms, with the most significant shift being towards industrialization. In the 1960s, approximately 80 percent of exports from developing countries were primary commodities. Today, nearly 80 percent of industrial products. This substantial transformation in export structures has been driven by the emergence of major industrial players, prominently including China, along with countries like Korea, India, Brazil, Malaysia, Vietnam, Indonesia, and Mexico. Many of these nations previously relied heavily on primary commodities but have since become deeply integrated into global production networks across diverse sectors.

Elhiraika and Hamed (2006) aimed to elucidate the factors influencing aggregate GDP growth in the United Arab Emirates (UAE), serving as a typical example of an economy heavily reliant on oil revenues. Beginning with an analysis of the country's economic performance over the period studied, the research delved into the determinants of GDP growth. Consistent with prior research, the study underscored the significant role of labor in driving overall GDP growth, while Total Factor Productivity Growth (TFPG) exhibits a negative contribution. Several factors contribute to this observation, including biases stemming from fluctuations in oil prices, the nature of investments, and challenges associated with a shortage of skilled labor to complement capital investments. Empirical findings suggested that, unlike economies endowed with diverse resources, an oil-rich economy like the UAE benefits predominantly from its natural resource abundance as a catalyst for growth. Furthermore, the study revealed that increasing the domestic investment rate and enhancing investments in human capital exert robust positive influences on economic growth in the UAE. Additionally, shocks in terms of trade – reflecting changes in international trade conditions – affect growth positively. However, the impact of growth in income among trading partners and inflation on UAE economic growth is noted to be positive but comparatively weaker.

The literature highlighted above illustrates that economies heavily reliant on oil are highly susceptible to fluctuations in oil prices, which can lead to considerable volatility. This vulnerability underscores the importance for nations to pursue economic diversification strategies aimed at reducing their reliance on oil. Diversification efforts involve expanding economic activities beyond the oil sector, thereby broadening the base of economic growth and reducing exposure to the risks associated with oil price shocks. By diversifying their economies, nations can enhance resilience, stability, and sustainability, ensuring they are less affected by the cyclical nature of the oil market. In essence, the literature emphasizes the imperative for oil-dependent nations to implement policies and initiatives that promote economic diversification. This strategic approach not only mitigates the inherent risks of relying heavily on oil but also

enhances long-term economic prospects by fostering a more balanced and resilient economic framework.

This paper distinguishes itself from existing literature through its regression methodology and selection of macroeconomic variables. The macroeconomic indicators employed here are derived from the Global Competitiveness Index. Additionally, other metrics are utilized to evaluate the performance of the Saudi Arabian economy.

This study adopts a quantitative approach to rigorously evaluate and assess the current state of the Saudi Arabian economy as it transitions away from its dependence on oil. In essence, we aim to quantitatively analyze Saudi Arabia's shift from an oil-based economy and propose policies that can facilitate this transition.

Rather than relying solely on qualitative assessments, we use empirical data and statistical techniques to provide a robust analysis of how Saudi Arabia is diversifying its economy. By leveraging quantitative methods, we intend to offer evidence-based insights into the economic policies and strategies that could support and accelerate this transformation.

4. Data and Methodology

The data utilized in this study was sourced from the Macrotrends website, spanning the period from 1968 to 2022. The variables under investigation include exports (EX) measured in Billions of USD, imports (IM) measured in Billions of USD, Real GDP (RGDP) measured in Billions of USD, Real GDP per capita (RGDPPC) measured in USD, and manufacturing sector output (MA) measured in Billions of USD. Several statistical tests will be conducted on this dataset to examine the long-term relationships among these variables.

The Augmented Dickey-Fuller (ADF) test is employed to ascertain the presence of a unit root in time series data, which indicates whether the series is stationary or non-stationary. Stationarity implies that the variable lacks trends or patterns over time, maintaining a constant mean and variance. This concept is crucial in time series analysis because many statistical techniques assume stationary data (Greene, 1995).

The Johansen Cointegration Test is utilized to determine if there exists a stable, long-term relationship (cointegration) between two or more non-stationary time series variables. This test's outcomes are significant in economic and financial analyses as they suggest enduring connections between variables that can be utilized in various modeling and forecasting exercises (Greene, 1995, p.567).

The Fully Modified Least Squares (FMLS) model, a sophisticated regression technique in econometrics, is applied to address potential issues such as endogeneity, autocorrelation, and heteroskedasticity in time series analysis. Endogeneity arises when independent variables are correlated with the error term, while autocorrelation refers to correlations between error terms over time. Heteroscedasticity denotes varying error term variances across observations. FMLS adjusts for these challenges by incorporating additional variables or instrumental variables into the model. Instrumental variables are proxies correlated with endogenous variables but not with the error term, aiding in capturing variation unrelated to errors. In summary, the FMLS model enhances the reliability and efficiency of parameter estimates compared to standard Ordinary Least Squares (OLS) regression, particularly in analyzing time series data, by comprehensively addressing endogeneity, autocorrelation, and heteroscedasticity issues (Phillips, 1995: 1023).

5. Results

The data for the analysis was collected from the Macrotrends website, and the EViews 12 software was used to analyze the data. We will start our analysis by conducting the Augmented Dickey-Fuller (ADF) test to show whether the variables are stationary or non-stationary.

The table below shows the results of the Augmented Dickey Fuller Test.

Table 1. Augmented Dickey-Fuller Test

Variable	Stationary / Non-Stationary
EX	No unit root at first difference
IM	No unit root at first difference
MA	No unit root at first difference
RGDPPC	No unit root at first difference
RGDP	No unit root at first difference

The table above presents the results of ADF tests conducted on various variables. Each row in the table represents a different variable, and the columns describe the outcome of the ADF test for each variable. The Stationary / Non-Stationary column indicates the outcome of the ADF test for each variable. For all variables, the test indicates "No unit root at first difference." This means that after differencing the data (i.e., subtracting each value from the previous value), the resulting series becomes stationary. In other words, the variables are stationary after taking the first difference. Since the results are stationary at first difference, we will now conduct the Johansen Cointegration Test, where the results are shown in Table 2 below.

Table 2. Johansen Cointegration Test

Variable-Pair	Cointegration
RGDP and EX	Yes
RGDP and IM	Yes
RGDP and MA	Yes
RGDPPC and EX	Yes
RGDPPC and IM	Yes
RGDPPC and MA	Yes

The above table presents the results of the Johansen Cointegration Test for several pairs of variables. The Variable column lists the pairs of variables being tested for cointegration. The cointegration column indicates the outcome of the Johansen Cointegration Test for each pair of variables. Based on the results, "Yes" indicates that cointegration is found between each pair of variables tested. This suggests that there exists a long-term relationship between the variables, even though they may individually be non-stationary.

We will now conduct the Fully Modified Least Squares Model for GDP as the dependent variable with EX, IM, and MA as the independent variables. The results are shown in Table 3 below.

Table 3. Fully Modified Least Squares Model

Independent Variable	Coefficient	P Value	Significance
EX	1015.230	0.0069	Significant
IM	1374.240	0.0163	Significant
MA	15153.980	0.0000	Significant

The table summarizes the results of a Fully Modified Least Squares (FMOLS) regression model, where the dependent variable is Real GDP. The table includes coefficients, p-values, and the significance of several independent variables.

The positive coefficient of 1015.230 for exports indicates that an increase in exports is associated with an increase in Real GDP. The p-value of 0.0069 is well below the standard threshold of 0.05, suggesting this relationship is statistically significant. Thus, exports positively and significantly impact Real GDP.

The coefficient of 1374.240 for imports implies that an increase in imports is also associated with an increase in Real GDP. With a p-value of 0.0163, which is below 0.05, this result is statistically significant. Imports have a significant positive effect on Real GDP. The very high positive coefficient of 15153.980 for Manufacturing Sector Output signifies a strong positive relationship between manufacturing sector output and Real GDP. The p-value of 0.0000 confirms that this relationship is highly statistically significant. Manufacturing sector output significantly boosts Real GDP.

Now we will rerun the Fully Modified Least Squares Method for RGDPPC as the dependent variable with EX, IM, and MA as the independent variables. The results are shown in table 4 below.

Table 4. Fully Modified Least Squares Model

Independent Variable	Coefficient	P Value	Significance
EX	28475.59	0.0147	Significant
IM	53795.78	0.0031	Significant
MA	314727.70	0.0001	Significant

The table summarizes the results of a Fully Modified Least Squares (FMOLS) regression model, where the dependent variable is Real GDP per Capita. The table includes coefficients, p-values, and the significance of several independent variables.

The coefficient of 28475.59 for exports indicates that an increase in exports is associated with a significant increase in Real GDP per Capita. The p-value of 0.0147, being below the 0.05 threshold, confirms the statistical significance of this relationship. Thus, exports positively and significantly impact Real GDP per Capita.

The coefficient of 53795.78 for imports implies that an increase in imports is also associated with a significant increase in Real GDP per Capita. With a p-value of 0.0031, which is well below 0.05, this result is statistically significant. Imports have a significant positive effect on Real GDP per Capita.

The very high positive coefficient of 314727.70 for Manufacturing Sector Output indicates a strong positive relationship between manufacturing sector output and Real GDP per capita. The p-value of 0.0001 confirms that this relationship is highly statistically significant. Manufacturing sector output significantly boosts Real GDP per capita.

6. Discussion

Based on the findings above, a 1 percent increase in exports is associated with a $1015.230B and $28475.59 increase in GDP and GDP per capita respectively. Conversely, a 1 percent increase in imports results in a $1374.240B and $53795.78 increase in GDP and GDP per capita respectively. These results highlight that imports have a more pronounced impact on both economic production and growth compared to exports. Therefore, it suggests that Saudi Arabia could potentially leverage import policies to stimulate its economy.

Furthermore, an analysis of the manufacturing value added output reveals that a 1 percent increase leads to a substantial $15153.980B and $314727.70 increase in GDP and GDP per capita respectively.

Summary of Hypotheses Acceptance and Rejection:

H1: Accepted – Imports have a positive and significant effect on Real GDP.

H2: Accepted – Imports have a positive and significant effect on Real GDP per Capita.

H3: Accepted – The increase in imports has contributed to Saudi Arabia's transition from an oil-dependent economy to a more competitive one.

H4: Accepted – The contributions of the manufacturing sector are positively correlated with GDP growth in Saudi Arabia.

H5: Accepted – There is a long-term equilibrium relationship between imports, Real GDP, Real GDP per capita, and sectoral contributions in Saudi Arabia.

In summary, these findings underscore the relative impacts of exports, imports, and manufacturing output on Saudi Arabia's economic performance. They suggest potential policy directions, such as focusing on import strategies to bolster economic growth.

7. Conclusion

The analysis indicates that a 1 percent increase in exports leads to a $1015.230 billion rise in GDP and a $28,475.59 increase in GDP per capita. In contrast, a 1 percent increase in imports results in a more substantial impact, with GDP increasing by $1,374.240 billion and GDP per capita by $53,795.78. This suggests that imports have a stronger effect on economic production and growth than exports, implying that Saudi Arabia could boost its economic stimulus by implementing strategic import policies. Additionally, a 1 percent increase in manufacturing value-added output significantly boosts GDP by $15,153.980 billion and GDP per capita by $314,727.70.

In summary, these findings highlight the relative impacts of exports, imports, and manufacturing output on Saudi Arabia's economic performance. They imply potential policy directions, such as prioritizing import strategies to stimulate economic growth.

Moving forward, to increase productivity, Saudi Arabia should focus on elevating its manufacturing sector to levels comparable to economies like Turkey, where manufacturing contributes around 22.11 percent to GDP as of 2022. This comparative benchmark underscores the importance of bolstering Saudi Arabia's manufacturing sector, leveraging its backward and forward linkages for economic benefits.

However, the study's limitations include the need for additional variables to comprehensively explain the dynamics of exports, imports, and the manufacturing sector. Better data availability would have enhanced the study's ability to provide specific recommendations. This study paves the way for future research to delve deeper into Saudi Arabia's manufacturing sector, highlighting its unique advantages such as its geographic location and status as the host of Makkah. These factors position Saudi Arabia for growth and development towards becoming a more advanced economy. We would hope that Saudi Arabia can follow the path of the substantial transformation in export structures that is driven by the emergence of major industrial players, prominently China, Korea, India, Brazil, Malaysia, Vietnam, Indonesia, and Mexico.

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