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The Impact of Oil Export, R&D, Inflation and FDI on GDP in Saudi Arabia

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ABSTRACT : The Kingdom of Saudi Arabia is the largest independent nation in Western Asia and is recognized as the largest economy in the Middle East and the Arab world, ranking among the top twenty economies globally. This systematic review aims to fill a gap in the literature, elucidating the impact of oil export, R&D, inflation, and FDI as a key determinant of economic growth, providing a comprehensive analysis of these components on the Gross domestic product (GDP) of Saudi Arabia. Economic Growth evaluation was typically assessed through GDP, which reflects a country's market benefits derived from the produced goods and services over a certain period. The findings revealed a heavy reliance of kingdom's economic growth on its oil revenue with more than 45% of its GDP being from oil export. This has made its economic growth vulnerable to the fluctuation in oil prices which is considered a leading factor for inflation pressure. However, the non-oil sector maintained a sustainable contribution to the overall GDP, particularly through Foreign Direct Investment (FDI) captivation and fostering skilled human capital through Research and development (R&D) promotion which led to a relative increase in the total GDP since the launch of 2030 Saudi Arabia vision. In summary, despite the substantial governmental initiatives aimed at economic diversification, the oil sector remains the primary contributor to Saudi Arabia's overall GDP underscoring the need for high-quality policies to ensure sustainable economic growth.

I. INTRODUCTION

The Kingdom of Saudi Arabia is the largest independent nation in Western Asia and the second-largest Arab nation following Algeria(Pehlivan, 2023:2331). Referring to a 2020 report by the General Authority for Statistics (GASTAT), It is considered one of the countries having the youngest population in the world with about two-thirds (36.7%) of its population being between the ages of 15 and 34 (Varun Godinho 2020) . Furthermore, Saudi Arabia is recognized as the largest economy in the Middle East and the Arab world and it ranks among the top twenty economies globally (Raid et al. ,2024:1). However, reports have highlighted the challenge for Saudi Arabia to accomplish sustainable economic development taking into consideration the impact of oil on GDP growth in Saudi Arabia (Hathroubi , Aloui ,2022; Abid , Alotaibi ,2020; Elghawy, 2020). Thus, Saudi Arabia along with other Gulf Cooperation Council (GCC) countries require a further concentrated efforts for improving their competitiveness in international markets and focus on innovation and technology sectors to establish high-skilled employment and maintain sustainable GDP growth (Banafea et al., 2018:46).

A. GDP & Economic Growth

Gross domestic product is the fiscal value of a country's market benefits derived from the products and services produced over a certain period (Bergh ,2009:117). It includes the measurement of either the incomes rewarded from the country's productions or the expenses spent on the final commodities and services it provides, both analysis approaches present the GDP in a formula explaining the driving factors for the economic growth (Trinh, 2017:14) . Yet, despite the continuous criticism regarding the adequacy of GDP as a relevant indicator of a country's economic state and progress, it remains the most dominant standard value for empirical economic evaluation (Bergh, 2009:11).

1) Saudi Arabia's Economic Development

According to several reports (Asseery and Al-Sheikh, 2004; Harvie and Pahlavani, 2006; Kogid et al, 2010; Tiwari, 2011), exports have been indicated as one of the main determinants of economic growth. Since the discovery of one of the world's largest petroleum fields by the Arabian American Oil Company (ARAMCO) in 1944 (Maass, 2012: 92), oil exporting became the main factor that regulates the macroeconomics and the GDP growth rate of Saudi Arabia, one of the major oil exporting countries, over the years. Additionally, the oil embargo has led to a significant elevation in oil revenue and oil production rate. By this, an increase in exports

of 68.9% driven a GDP growth rate peak of about 40% on average (Raid et al. ,2024:3). Afterward, the GDP went through continuous fluctuation from 1980 to 2020 as a result of oil price volatility consequential to several fiscal and political circumstances, including a global decline in oil demand especially from Europe and China, oil overproduction from US shale, and the decision of OPEC to fix the production level at 30 million barrels per day (Almutairi ,2020:182).

II. Governmental Approaches for Improving GDP

It has been stated that achieving efficient economic growth and development needs a structural fiscal change implementation (Aljabori, 2015:22). In line with this belief, governmental efforts to improve economic development in sectors other than oil, was consisted in promoting nine (five-year) development plans over the period from 1970 to 2014. Subsequently, the 2030 Saudi Arabia Vision was launched in April 2016, accompanying several initiatives for diversifying the GDP through developing various sectors including infrastructure construction, education, health, and tourism aiming to alleviate the major reliance on oil revenue and increase the activities private sector to lead a gross domestic product of 65% (Nurunnabi ,2017:557; Raid et al., 2024:4).

However, several reports have highlighted the shallow contribution of the non-oil GDP to the economic diversification till 2014, and the steady dominance of oil and trade in Saudi Arabia's GDP. By 2020, the Non-oil GDP contribution reached about 33% with that 17% from the government sector and 40% accounted for the private sector which was only 11% in 1970. This may note a progressive but limited diversification efforts by Saudi Arabian government (Albassam 2015; Banafea and Ibnrubbian 2018; Hvidt 2013; Mehrara 2013; Tim Callen 2014). In this context, several studies have addressed the relationship between the non-oil GDP and the oil price fluctuation by which private investment and industrial exports showed to be more sensitive to oil prices compared to agricultural exports or technology products which were merely affected (Abid a Alotaibi ,2020; Elghawy ,2020; Hathroubi and Aloui, 2022)

Furthermore, the COVID-19 pandemic in 2020 led to a global economic crisis with a 3.3% decline in GDP growth rate compared to 8.2% in the previous year (Raid et al. ,2024:3). At this point, the Saudi GDP growth rate experienced its lowest level of about 4.1 % decline in 2020 (Ma ,2022:619). This sharp decline was mainly attributed to the severe drop in oil demand globally along with a reduced investment by 1.3% within Saudi Arabia due to the global Quarantine (Ma 2022:620) . Gradually in 2021, the Saudi economy started to return to its pre-pandemic activity with a slight improvement in GDP, which has doubled in the following year 2022 (Md. Saiful Islam 2024).

B. The Impact of Oil on GDP in Saudi Arabia

Since the discovery of oil in 1938, Saudi Arabia has been a major player in the global oil market, defining itself as one of the largest producers and exporters of this valuable resource by owning 16 % of the world's total reserves (Agboola et al. ,2021:1). Consequently, the oil reserves have become essential for driving Saudi Arabia's economic growth. In 1973, the oil embargo resulted in a significant rise in oil prices. As a member of the Organization of Petroleum Exporting Countries (OPEC), this played a significant role in boosting the GDP of the Saudi kingdom from 29.14% in 1970 to about 73.45% by 1974 (Nurunnabi ,2017:7).

Originally, the OPEC organization was settled on September 14, 1960, in Baghdad by representatives from Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela. This was provoked by continued reductions in oil prices in the period between 1959 and 1960 mandated by oil overproduction in global markets from independent producers like the Soviet Union and major oil corporations. This led to a 10 % price drop which was the first since 1949, and was aligned with the government's rising concerns over oil prices.Since the "fifty-fifty" profit-sharing agreements of 1950-54, price fluctuations have significantly affected oil revenue triggering the Middle Eastern government especially Venezuela to call for concerted efforts to regulate future posted oil prices, leading to the generation of the OPEC organization (Issawi ,1978:8). During the war in 1973, the OPEC headed by Saudi Arabia and other Arab nations imposed an oil embargo against the US and Canada and European countries, this embargo contributed a sharp increase in oil prices that consequently resulted in significant improvement in the Kingdom's GDP (Alkhathlan ,2013:343).

In alignment with the early vision of the need for economic diversification, the considerable GDP growth in the late 1970s promoted the Saudi Arabia government to hardly invest in infrastructure projects (Al Naimi ,2022; McNulty ,1984) such as building extensive road networks, expanding airports, enhancing ports, and upgrading telecommunications systems. Moreover, the government has invested in the chemical and petrochemical industries through the initiation of the Saudi Basic Industries Corporation (SABIC), which has evolved into one of the world's largest petrochemical manufacturers (SecilTuncalp ,1991:288).

Subsequently, Saudi Arabia's GDP experienced a consecutive slump attributed to a steep decline in oil prices. The first was due to a global economic downturn accompanied by a sever drop in oil demand worldwide in 2008 (Moreno, 2010:347). While the second downturn was in 2014, marked with a 13% drop in the Kingdom's oil GDP driven by the sluggish economic growth of China along with the resistance from other oil-exporting nations to reduce oil production and the shale oil revolution in the USA and Canada (Jawadi a Ftiti, 2019:4) .

Moreover, the oil shock and various geopolitical factors led the oil price to fluctuate, presenting a challenge for Saudi Arabia's government to maintain sustainable economic development and advocate the search for more sustainable sources to diversify the GDP. Thus, yheInternational Monetary Fund (IMF) revealed warnings to the oil-rich Arab nations of the Gulf Cooperation Council (GCC) for the financial and political venture of relying on oil revenue mainly for GDP and economic development necessitating the importance of diversifying sources for GDP growth. Therefore, the Saudi government's Vision 2030 and the associated National Transformation Program 2020 outlined a series of initiatives aiming to balance its budget by 2020, and shifting its main reliance on oil revenue toward diversifying the economy through investments by 2030.(Moshashai et al. ,2020:2).

C. The Impact of Foreign Direct Investment on GDP in Saudi Arabian

Foreign Direct Investment (FDI) refers to investment prompted by agencies or individuals from countries in other enfolding the business in concern. It involves buying companies and extending business activities to be conducted in another country ending with the building of new facilities, infrastructure, and hiring local staff in the host country. Conversely, indirect investment entails purchasing financial securities, stocks, or bonds of companies operating abroad through fiscal instruments or entities housed in a third country (Albassam ,2015:1215)

Additionally, the enormous impact of FDI on a nation's economic development has been well-recognized (Abdel-Rahman 2010; Aljehani and Shaheen 2021; Alshehry 2015; De Mello 1997, 1999; Kurtishi-Kastrati 2013). It cultivates a competitive business environment, promotes global commerce assimilation and technology transfer, and advances business development resulting in overall improvement in the GDP (Ramady and, Saee 2007:39). Furthermore, it supports the formation of human capital that results in an overall improvement in education, healthcare and nutrition, research, and employment creation. Generally, FDI leads to an improved social environment in the hosting country by impelling superior technologies and demonstrating corporate policies that are more socially responsible (Kurtishi-Kastrati ,2013:2).

Thus, being an oil-rich country makes Saudi Arabia an attractive hub for resource-based FDI (Nunnenkamp, 2001:6). In early 1980, the kingdom's government took its first steps regarding economic diversification through the SABIC foundation which concerned the investment in petrochemical industries. This initiative accomplished an improvement in the Kingdom's GDP through the introduction of a new exporting sector leading Saudi Arabia to become the dominant exporter of petrocheals worldwide. Moreover, SABIC generation aided in elevating the governmental revenue through taxis, royalty, and returns (SecilTuncalp ,1991).

Yet, the governmental efforts for inpouring FDI were not a recent development. The first law regulating foreign investment was revealed as early as 1956. This was followed by two subsequent more comprehensive legislations in 1963 and 1978 that provided a considerable incentive to rouse investment. In 2000, the Saudi Arabian General Investment Authority (SAGIA) was established to contribute to the prerequisites needed to improve the inflow of FDI and attract expertized investment agencies. Remarkably, the SAGIA brought about several privileges for foreign investors, by opening the investment both in national and foreign or wholly foreign investor-owned companies besides reserving the same profits, benefits, and deposits in the hands of national projects according to rules and directions (Abdel-Rahman ,2010:4).

With the contribution of FDI to the kingdom's GDP, the GDP had a sharp increase in the eighteens caused by SABIC development and the significant FDI inflow into petrochemical industries, reaching a financial share of 74.8% (Abdel-Rahman,2010:7). In the subsequent years, FDI continued to grow steadily notably following the generation of SAGIA by which the number of FDI increased from 820 in 2000 to 6748 in 2010 encompassing sectors in a wide range including fiscal and oil sectors (Albassam 2015).

Furthermore, FDI in Saudi Arabia is manifested mostly in three main types: Greenfield investments, Offset Programs investments, and Contractual / Equity Joint Ventures with the Equity joint venture being the dominating FDI type in the Kingdom of Saudi Arabia (Abdel-Rahman ,2010:6). The equity joint ventures include the financial operation of restricted accountability entities sharing the risks and profits. Conversely, the contractual joint ventures are based on contracted cooperation between two distinctive entities defining the venture environment, the profits and returns sharing along with losses and risk management and the property attribution upon investment completion(Diane T. Weber 1990). Thus, given the focused orientation of the Saudi government toward economic diversification and growth, the offset investment programs were typically indirect (Bonetti ,1998:230) by which the foreign investment entity aids in the country's venture development regardless of the importing contract. Greenfield investment involves foreign investment in host countries from the ground up and developing new regulations in the process(Alharbi ,2023:26). Therefore, this type of investment aligns with the principle of the new investment law as it promotes a competitive investment environment and improves economic capacity(Abdel-Rahman 2010).

Yet, despite the positive impact of FDI on the Kingdom's economic growth, it is proposed to be insignificant due to various challenges and barriers (Abdel-Rahman 2010; Albassam 2015). A study based on a survey conducted with Saudi managers and enterprises concluded the need for economic resolution along with

education system improvement in means to harvest skilled workers and solve the unemployment rate (Ramady and Saee, 2007) . Additionally, Saudi Arabia is considered in-experienced in this level of FDI hesitating foreign investors from durable investment, besides their limited knowledge of the Saudi market that promotes them to invest in successful local projects and avoid the sectors that need foreign expertise more as they are typically considered highly costing and lack the governmental support (Albassam,2015:1224). Moreover, based on a report released in 2002 by the Organization for Economic Cooperation and Development (OECD), the best benefit from FDI for a country's economic development could be attained through the construction of high-quality policies that promote transparency, control corruption, and regulate business practices (OECD ,2002).

D. The Impact of Inflation Rate on GDP in Saudi Arabia

Inflation is a crucial fiscal indicator of the general price elevation rate of products and services. It also refers to the reduction of money purchasing power by which purchasing the same service or product requires a higher amount of currency (Smith, 2018: 903). Typically, it is utilized by governments and entities critically for assessing its economic impact. and could be calculated in various methods.Price indices including the Consumer Price Index (CPI) and the Producer Price Index (PPI), is mostly used by economists to quantify changes in the cost of living and production inputs, respectively. These indices determine the rate of inflation and its implications for economic stability when they are evaluated over time, and this aids in monitoring the average price levels of a predetermined basket of goods and services consumed by citizens or utilized in production processes. (Johnson, 2019: 214). Thus, the CPI differs from the PPI in that it tracks the average change in prices of a fixed basket of goods and services, including food, housing, transportation, and healthcare purchased by civil consumers (Brown et al., 2020: 130). In contrast, the PPI records selling price changes experienced by domestic producers for their output (Miller, 2017: 50). Thus, for governments and policymakers, an alternative measure of inflation could offer further insights into underlying price movements, certainly the case of core inflation and trimmed mean inflation, since it aids in excluding volatile components like food and energy prices and helps distinguish persistent inflationary pressures from temporary fluctuations, allowing for more focused policy actions (Fischer et al., 2016: 105).

Moreover, inflation shape is highly triggered by the underlying price movement and the associated changes in sum demand and supply. For instance, Demand-pull inflation is driven by surpassing aggregate demand over the aggregate supply(Mankiw 2018:45). In Saudi Arabia, Demand-pull inflation is stimulated by certain variables such as government spending, investment inflows, and changes in oil revenues. However, policymakers must be cautious to avoid excessive price increases that reduce consumers' purchasing power even though moderate demand-pull inflation can boost economic activity(Jones, 2019: 75). Additionally, cost-push inflation is caused by an increase in the costs of production, such as wages and raw materials. When production costs rise, producers pass on the higher costs to consumers in the form of higher prices. this type of inflation can be driven in Saudi Arabia by several factors like rising global oil prices, higher import costs, or supply chain disruptions. This type of inflation can reduce profit margins for businesses and lower the real income of citizens, creating challenges for both producers and consumers (Brown et al., 2018: 205). It is often associated with supply shocks, such as an increase in oil prices or natural disasters that disrupt production (Blanchard 2017:62).

Yet, social pressures for wages, rigidities in the labor market, and contractual salary agreements are proposed causes of built-in inflation, also referred to as wage-price inflation in the Saudi Kingdom (Johnson, 2020: 150). This inflation is driven by workers demand for higher wages as a response to elevated prices and then leads to further higher prices resulting in a feedback loop (Samuelson and Nordhaus 2010:53).

As well as, government policies play a vital role in impacting inflation dynamics in Saudi Arabia. This includes fiscal regulations for taxation, government spending, and subsidies along with strategies for influencing borrowing costs, investment levels, and aggregate demand. The Saudi Arabian Monetary Authority (SAMA) played a strategic role in adjusting interest rates and money supply management (Smith, 2020: 45). While exchange rate fluctuations and global economic trends can amplify inflationary pressures in Saudi Arabia. Being a major oil exporter makes the Saudi currency (Riyal) closely linked to global oil prices. leading to higher prices for imported goods and services in case of depreciation of the Riyal relative to major currencies can increase import costs, thus contributing to inflation (Brown, 2019: 125). Finally, a slope in the global economic growth rate may reduce oil demand and eventually lower Saudi Arabia's revenues and lead to deflation (Jones, 2017: 210).

Saudi Arabia has experienced varying inflation rates in recent years due to several economic and global factors. The Arab oil embargo started in October 1973, has led to a sharp increase in oil prices globally. Thus, as a major oil producer, Saudi Arabia's revenues ascended, leading to rapid economic growth and development (Nurunnabi 2017:7). During this period, the subsequent increase in government spending attributed to higher inflation rates (Saudi General Authority for Statistics 2020:15).

Additionally, in recent years, Saudi Arabia has experienced moderate inflation rates of about 2% to 3% in the early 2010s, and saw a notable increase in the mid-2010s due to government reforms and subsidy cuts (Al-Darwish et al. 2015:14).In 2018, a notable inflationary pressures was on Saudi Arabia's economy due to economic reforms implemented under Vision 2030, which included the introduction of a Value Added Tax

(VAT) at 5% and cuts in subsidies aiming to diversify government revenue sources and reduce dependency on oil revenues (Saudi General Authority for Statistics 2018:5). This led to increasing the Saudi residents living costs (Saudi General Authority for Statistics 2018:8) , and raising consumer prices consequential to subsidies cut on fuel and electricity(Saudi General Authority for Statistics 2018:9), contributing allover to inflation rate of 2.5% (Saudi General Authority for Statistics 2018:10).

Moreover, the COVID-19 pandemic in 2020, led to economic disruptions worldwide, including in Saudi Arabia. it impacted its economic activities and reduced the oil prices significantly due to global decline in oil demand (Saudi General Authority for Statistics 2021:12). The pandemic caused an inflation rate elevation of 3.4% by disrupting supply chains, causing shortages, and tripling the VAT rate from 5% to 15%, leading to a rise in the prices of goods and services (Saudi General Authority for Statistics 2021:16). the (Saudi General Authority for Statistics 2021:15).

Therefore, inflation in Saudi Arabia, driven by its unique economic structure and dependence on oil, went through different phases over the years. The government's efforts to diversify the economy and implement reforms through Vision of 2030 (Vision 2030 2016:13). Yet, besides the role played by SAMA using monetary policy tools to control inflation, such as adjusting interest rates (SAMA 2018:7) are crucial in managing inflationary pressures and ensuring economic stability.

The Impact of Research and Development on GDP in Saudi Arabia

A comprehensive understanding of R&D definition and its measurement is essential for a precise evaluation of its impact on economic growth and development , particularly in Saudi Arabia. R&D is a systematic innovative work designed to expand the knowledge stock of several aspects including society, humanity, and culture, and use this knowledge in developing new applications (Freeman ,1995: 25).

Thus, compared to traditional sectors, R&D typically provides higher productivity gains driving overall GDP growth (OECD 2020:15).it cultivates skilled nations making them more competitive globally captivating foreign investment which maintains sustainable economic development and reduces vulnerability to economic fluctuations and external shocks. From 1984 to 1996, the non-oil sector had made a greater contribution to the total GDP compared to the oil sector(Choudhury and Al-Sahlawi 2000) . According to World Bank reports, the Knowledge Economy Indicator (KEI) showed a growth from 4.6 to 5.96, in Saudi Arabia, between 2000 and 2012. This trend suggests a positive indication for real efforts in the development of a knowledge-based economy(Amirat and Zaidi 2020).

Furthermore, developing a diversified innovation economic system has become essential for promoting venture capital, developing collaboration, and accelerating the commercialization of R&D outcomes in Saudi Arabia. The establishment of technology parks, incubators, and accelerators was a key contributor to fostering a vibrant innovation economic system in Saudi Arabia (Al-Mansoori et al., 2017: 102). This included a wide collaboration between stakeholders, investors, research institutions, government agencies, and support organizations to drive innovation and economic growth (Johnson et al., 2020: 78).

Therefore, the government of Saudi Arabia plays a crucial role in promoting R&D through strategic initiatives and funding mechanisms. The Saudi Vision 2030 highlighted the significance of investing in R&D to maintain economic diversification and reduce reliance on oil revenues (Vision 2030: 2016). Key institutions like the King Abdul-Aziz City for Science and Technology (KACST, 2019: 14) and the Saudi Arabian Monetary Authority (SAMA, 2020: 8) coordinate and support R&D efforts across various sectors.

Moreover, government cooperation with industry and academia plays a vital in fostering innovation ecosystems that facilitate knowledge conduction from a foundation of research to the marketplace (Al-Salem et al., 2020: 275). Collaborative research initiatives and technology transfer programs enable Saudi Arabia to leverage its intellectual capital, creating value-added products and services (Al-Salem et al., 2020: 277). Additionally, collaboration with international partners through joint research projects, technology licensing agreements, and participation in global innovation networks enable the Kingdom to leverage the strengths of its international partners to accelerate diversification efforts (Al-Hajri, 2020:146) and to access cutting-edge technologies, expertise, and market opportunities beyond its borders (Smith et al., 2021: 156). Thus, a skilled workforce through investment in human capital development is crucial for driving innovation and entrepreneurship across diverse sectors. Education and training programs are essential in cultivating individuals with the knowledge, skills, and competencies for establishing a knowledge-based economy (AlGhufli,2019:211).

Moreover, in recent years, the Kingdom has made significant investments in building research facilities, innovation clusters, and technology incubators (Al-Khaldi et al., 2020: 345). This initiative was based on the approach of considering the investments in research infrastructure and innovation hubs critical for fostering a culture of innovation and supporting R&D activities in Saudi Arabia. (Al-Qahtani et al., 2019: 1). Yet, economic diversification through R&D investment requires a supportive policy framework that focuses on creating a conducive business environment, promoting investment in R&D, and fostering collaboration between government, industry, and academia (Al-Rashidi et al., 2019: 88). Therefore, developing fine control frameworks, effective communication channels, and partners mutual trust are the essential factors to maximize

the potential benefit of collaborative R&D ventures and to beat several facing challenges. Among these challenges are the intellectual property rights issues, funding mechanisms, and organizational culture which should be addressed to enhance their effectiveness. (Ahmad & Khan, 2019:94).

III. CONCLUSION

With Saudi Arabia being a leading oil exporter, it plays a vital role in the global oil market. Thus, tis systematic review aims to have a deep insight into the impact of oil exports, inflation, FDI, and R&D variables on Saudi Arabia's economic growth by means of GDP, contributing to evidence-based recommendations for policymakers to launch effective policies and initiatives that stimulate economic growth and innovation. The findings revealed that Saudi Arabia's economic growth has been tied to global oil prices, making its GDP growth rate vulnerable to oil price fluctuation due to different geopolitical factors. Consequently, inflationary pressure would have an negative impact on the Kingdom's GDP necessitating governmental strategies and fiscal initiatives to alleviate the dependency on oil revenue and diversify its economic resources to attain sustainable GDP growth. Thus, the governmental focus on promoting foreign direct investment and fostering R&D development through the establishment of facilities and regulating policies has proven positive increase in the GDP and promote sustainable economic growth. Collectively, despite the governmental efforts in economic diversification and reducing the reliance on oil revenue, the non-oil GDP still had a limited contribution to Saudi Arabia's economic growth requiring a further concentrated effort to improve its competitiveness in international markets and focus on innovation and technology sectors to establish high-skilled employment and maintain sustainable GDP growth.

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