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Analysis and Projections of Foreign Direct Investments in Iraq

Irak'ta Doğrudan Yabancı Yatırımların Analizi ve Öngörüleri

Sayed Niyam Alami [a,*] Pierre Rostan [b] & Alexandra Rostan [c]

[a] American University of Iraq - Sulaimani (AUIS), 46001, Iraq
ORCID: 0000-0002-6450-4246
[b] American University of Iraq - Baghdad (AUIB), 10023, Iraq
ORCID: 0000-0003-1046-0214
[c] American University of Iraq - Baghdad (AUIB), 10023, Iraq
ORCID: 0000-0002-8204-1361

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ÖZ

Bu makalenin amacı, Irak'a gelen Doğrudan Yabancı Yatırım (DYY) miktarını, Suudi Arabistan ile karşılaştırmalı olarak 2100 yılına kadar olan tarihsel veriler ve tahminlerle analiz etmektir. Bulgular, Irak'taki Doğrudan Yabancı Yatırımın 1970 ile 2022 yılları arasında GSYİH ile negatif ve orta düzeyde bir korelasyona sahip olduğunu ortaya koymaktadır (-%51). Bu dönemde doğrudan yabancı yatırım ekonomik büyümenin motoru değildir. Bu iki değişken arasındaki ilişki önümüzdeki yıllarda tersine dönerek +%86'ya ulaşması öngörülmektedir. Böylece doğrudan yabancı yatırım Irak ekonomisindeki büyümenin temel itici gücü olacaktır. Suudi Arabistan'ın hikayesi bu durumun tam tersidir. Suudi Arabistan'daki doğrudan yabancı yatırımların 1970 ile 2022 yılları arasında GSYİH ile pozitif ve orta düzeyde bir korelasyonu vardır (+%49). Böylece doğrudan yabancı yatırım ekonomik büyümenin motoru olmaya devam etmiştir. Bu iki değişken arasındaki ilişki önümüzdeki yıllarda tersine dönerek -%44'e ulaşması gönderülmektedir. Sonuç olarak büyüyen ekonomi kendi kendine yeterli olacak, yeterli nakit akışı yaratabilecek ve böylece ekonomi artık büyüme için doğrudan yabancı yatırımlara bağımlı olmayacaktır.

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ABSTRACT

The objective of the paper is to analyze Foreign Direct Investment (FDI) in Iraq, benchmarked to Saudi Arabia, with historical data and forecasts up to 2100. The findings reveal that FDI in Iraq had a negative and moderate correlation with GDP between 1970 and 2022 (-51%). FDI was not an engine of economic growth. The relationship between these two variables is predicted to reverse in the coming years and reach +86%. Thus, FDI will be a key driver of growth in the Iraqi economy. The story of Saudi Arabia is the opposite. FDI in Saudi Arabia had a positive and moderate correlation with GDP between 1970 and 2022 (+49%). Thus, FDI remained an engine of economic growth. The relationship between these two variables is expected to reverse in the coming years and reach -44%. Finally, the growing economy will be self-sufficient, being able to generate enough cash flows so that the economy no longer depends on FDI for growth.

1. Introduction

Iraq and Saudi Arabia are two oil-based economies, ranked respectively fifth and second in terms of oil reserve globally with 8.7% of world share for Iraq and 16.2% for Saudi Arabia and ranked globally sixth and second as oil producers (Worldometers, 2024). Iraq and Saudi Arabia both belong to the list of emerging countries as the International Monetary Fund (IMF) defines them as "countries with low to middle per capita income that have undertaken economic development and reform programs and have begun to 'emerge' as significant players in the global economy" (Rousseau, 2015). Iraq and Saudi Arabia also belong to the

* *Sorumlu yazar/Corresponding author*.
e-posta: *rostan.pierre@gmail.com*

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list of developing countries defined by The United Nations (2014) as a country with a relatively low standard of living, undeveloped industrial base, and moderate to low Human Development Index (HDI). This index is a comparative measure of poverty, literacy, education, life expectancy, and other factors for countries worldwide, the greater the more developed the country. In 2021, based on HDI, Saudi Arabia was ranked 35th globally when Iraq was ranked 121st (The United Nations, 2022). In 2022, the GDP (current US$) was estimated at $1,108,149 million for Saudi Arabia and $264,182 million for Iraq (The World Bank, 2022a), making the size of the Saudi economy 4 times larger than Iraq, ranking the two countries 17th and 49th globally. The GDP per capita (in current US$) was estimated at $30,436 for Saudi Arabia and $5,937 for Iraq (The World Bank, 2022b). The Revenue minus production cost of oil expressed as percent of GDP in 2021 was estimated at 42.79% for Iraq and 23.69% for Saudi Arabia, ranking globally these two economies second and fifth respectively (TheGlobalEconomy.com, 2024). Saudi Arabia is therefore a more diversified economy than Iraq, with the successful Saudi Vision Plan launched in 2016 by the Crown Prince and Prime Minister of the country, HRH Mohammed bin Salman, contributing to the diversification of the economy since then.

Foreign investment flows into a country take a direct or indirect form. Foreign indirect investments (FDIs), also called portfolio investments, are defined as short-term and profit-oriented purchases of securities and other financial assets that are in most cases not intended to help another country's economy. As such, investors buy stakes in stocks, bonds, mutual funds, etc., which are being traded on stock exchanges, in foreign countries. In contrast, FDIs are "when investors purchase a physical asset such as a plant, factory, or machinery in a foreign country" (CFI Team, 2023). Direct foreign investments are preferred by receiving countries because the investments in assets are long-term-oriented and thus help the countries' economies over time.

The objective of the paper is to analyze Foreign Direct Investment (FDI) in Iraq, benchmarked to Saudi Arabia, with historical data and forecasts up to 2100. The research problem will be to track FDI and its relationship with GDP and crude oil price during the 1970-2022 historical period and for the next 78 years up to 2100 based on forecast estimates. The novelty of the paper will be to bring more insight into the dynamics of FDIs in Iraq and Saudi Arabia, their relationship and into the future of these two economies using forecast estimates obtained from an innovative wavelet analysis forecasting model.

2. Literature Review

2.1. Foreign Direct Investment, its impact and its drivers

OECD (2009) defines Foreign Direct Investment (FDI) as "a category of cross border investment made by a resident in one economy (the direct investor) with the objective of establishing a lasting interest in an enterprise (the direct investment enterprise) that is resident in an economy other than that of the direct investor". According to this definition, this lasting interest is backed by the fact that the investor (a country or sometimes a multinational firm) possesses at least 10 percent of total voting shares or rights in the foreign firm. The dominant players and investors in these cross-border FDIs are usually Large Multinational Enterprises (MNE); nevertheless, small and medium-sized firms have also recently become involved with FDI. Regarding the significance of FDI, OECD states that FDI "encourages the transfer of technology and know-how between economies. It also provides an opportunity for the host economy to promote its products more widely in international markets. FDI, in addition to its positive effect on the development of international trade, is an important source of capital for a range of host and home economies" (OECD, 2009, p. 16). FDI has been extensively studied in terms of its effect on economic growth, especially for developing countries. The epitome of this correlation has been evidenced by the success story of China, whose economic growth has been largely attributed to FDI. Categorized as a developing country such as Saudi Arabia and Iraq, China has over the years recorded a huge influx of FDI pouring into the country, which in turn has played a significant role in boosting its economic development (Zeng and Zhou, 2021). Many development economists believe that a rapid economic boost often requires a significant level of investment. Moon and William (1993) posited that "often, the most rapidly growing economies have been driven by an external engine." Nevertheless, there have been numerous empirical works and literature in this field that yields mixed results when it comes to the relationship between FDI and economic growth. Lasbrey et al (2018), referring to 55 empirical papers over three decades, found that the effect of FDI on economic growth was mixed but most of the time significantly positive, and in some cases, negative or even null (p. 309). Iraq as a developing and fuel-exporting country benefited from the positive impact of FDI on its economy, more precisely thanks to investments in its oil sector (Abdullah, 2020).

Examining the causal effect of FDI on economic growth has been said to be one of the most widely conducted endeavors in academic research on economic development over the past five decades (Dinh et al., 2019). A study conducted in Indonesia investigated the impact of FDI on economic growth using sectoral data during the period 1997-2006. The findings stated that on an aggregate level, there was a positive relationship between FDI and economic growth; however, there was no benefit of FDI when it came to a few specific sectors of the economy. FDI had even a negative impact on the growth performance of 12 the mining and quarrying sector. Based on the empirical evidence, the study argued that FDI in extractive industries can potentially have a negative impact on the economy because it provides more input to an already abundant industry and in a manner leads to a 'resource curse' paradox. The incoming investments in

these sectors could also encourage rent-seeking activity and thus weaken the local economy (Khaliq and Noy, 2007). Similarly, a study by Abbas and Mosallamy (2016) studied FDI-economic growth interaction in 13 Middle Eastern and North African (MENA) countries over the period of 2006-2013. This research is distinct in the sense that the data included a period of crisis for the region (the global financial crisis and the Arab Spring) and the fact that most of these countries have the primary resource of oil. The research found that infrastructure, human capital, lagged FDI and market openness were the significant factors that influenced FDI inflows into the region. Infrastructure was negatively significant, meaning if domestic investors supported infrastructure, it discouraged FDI from foreign investors. Meanwhile, human capital was negatively impacting FDI because firms did not show interest in MENA region for its uneducated human resources used as cheap labor. Notwithstanding the foreign firms' approach to the region, the human capital is still expected to have the bare minimum knowledge of being able to implement and utilize the technology brought in by those firms. The most significant finding was that market openness positively impacted FDI and that FDI inflows in the MENA region were primarily due to its market openness as it is deemed a trade hub. On the other hand, Abbas & Mosallamy (2016) also pointed to purportedly insignificant variables such as availability of resources and political stability. Unlike Phung (2016), resources had a positive, yet insignificant relation to FDI because despite the MENA region being oil-rich, protectionist policies of countries were said to deter FDI. Political stability was also surprisingly negatively impacting FDI because firms are believed to be swaying markets in their favor due to existence of corruption and political instability in the region, so the more stability, the less FDI. The reviewed literature paints a complex picture of the relationship between FDI and economic growth in developing countries. While the majority of the studies indicate a positive association between FDI and economic growth, there are a handful studies with varying results, primarily due to contextual factors. The literature was unanimous on FDI's role in transferring and providing capital, technology, and management knowledge, but also points to the importance of absorptive capacities and favorable business environments for the most efficient execution of FDI in host countries. Determinants such as human capital, market size, trade openness, and infrastructure (among others) were the shared terms outlined by the research reviewed that were said to be crucial in shaping FDI's impact. Phung's (2016) exploration of evolving determinants, Abbas and Mosallamy's (2016) MENA region focus, and Kumari and Sharma's (2017) Asian developing countries study underscore the multifaceted nature of FDI effects. These insights emphasize the need for tailored policies and strategies to optimize the positive outcomes of FDI while navigating its complexities.

2.2. Overview of FDI trends and patterns in Iraq and Saudi Arabia

Between 1970 and 2004 (refer to Figure 1), the economy of Saudi Arabia (represented by its GDP) grew at a sustainable pace (+12.06% annual growth rate) but the FDI stagnated, following a sinusoidal pattern centered on an annual average FDI of +$0.7 billion. Between 2004 and 2021, Saudi Arabia experienced a remarkable surge in GDP tripling its level, the Saudi FDI following the positive trend of its economy by jumping to a FDI annual average +$13.86 billion over the period. Additionally, it achieved a significant jump in its ranking in the Economic Complexity Index (ECI), moving from 99th in 2011 to 31st globally in 2021. The Economic Complexity Index (ECI, Hidalgo and Hausmann, 2009) is a holistic measure of the productive capabilities of large economic systems, typically countries. The ECI aims to explain the knowledge accumulated in a population, knowledge expressed in the economic activities present in the country. Higher economic complexity as compared to a country's income level drives economic development. Saudi Arabia successfully added productive capabilities to enter new sectors that will drive growth in coming years. As a comparison, with an ECI ranked 112th in 2021, Iraq failed to diversify its knowhow and faces low growth prospects in coming years.

As mentioned earlier, FDI started after 2003 in Iraq. During the period 2003-2006, considered as an essential transition period from Saddam Hussein's isolated regime, projects were implemented by foreign countries. In 2006, the Iraqi Federal Government approved the Investment Law No. 13, also called Federal Investment Law – a first step towards attracting foreign investment into Iraq" (Ali and Jameel, 2021). After 2006, significant investments and capital poured into this country. Although Iraq was mired in a protracted bout of conflict and stagnation, there have been new economic opportunities surfacing in this period. According to Ali and Jameel (2021), rebuilding Iraq offered one of the biggest global investment opportunities in decades, even though continued political chaos and uncertainty created a risky business environment" (p. 385). Since then, Iraq has faced numerous challenges, including political instability, security concerns, corruption, and inadequate infrastructure, which has hindered its ability to fully harness the potential of foreign investments. Over the past two decades, Iraq has witnessed varying levels of FDI inflows primarily due to geopolitical and security challenges, as well as regulatory and economic uncertainties. According to Jivraj (2023), the investment climate has been affected by a variety of reasons, starting with the 2003 US-led invasion, sectarian conflict and the war against the Islamic State (IS). Besides, the eruptive political environment, excessive economic reliance on oil, corruption, and debilitated physical infrastructure have all come together to affect Iraq's position as an attractive destination for investment.

Iraq experienced a steep decline in FDI net inflows around 2013-2014 that coincides with the resurgence of IS in Iraq, with the extremist group's size peaking in 2014.

From then onwards, the FDI net inflow figures have been in the negative every year despite being on an upward trend. The negative inflows mean that there is capital flight and the amount of money invested in the country is less than the amount pulled out of the country – alternatively called divestment, a situation that is not preferred or favorable. In such a circumstance, foreign investors are wary of the instability and uncertainty in the country and thus are discouraged from assuredly investing. There are other reasons for such a consistent outcome of negatives year after year since IS was defeated in 2017 – thus the detailed exploration of all these causes is conducted in sections that follow. The reasons that have potentially discouraged investors are associated with oil sector dominance, infrastructure and service disruptions, inconsistent regulatory environment, lack of access to finance, lack of economic diversification, bad reputation and perception, and socio-political factors in Iraq. One notable pattern of FDI inflows into Iraq that is pointed to by researchers and that is worth mentioning is their uneven distribution, both sectoral and geographically, Kurdistan, which is a semi-independent region in northern, has been attracting a huge chunk of inflows owing to its relative stability and investor-friendly environment.

2.3. Factors influencing FDI inflows in Iraq and Saudi Arabia

The factors influencing FDI flows are the variables which have an impact on FDI flows by extension on overall economic growth.

Samargandi et al. (2022) identified factors positively influencing FDI flows in Saudi Arabia: 1) Trade openness which helps Saudi Arabia increasing FDI inflows by lowering trade barriers such as trade duties, customs and taxes. 2) Institutional quality has a positive and significant impact on FDI. Saudi Arabia should improve overall institutional quality, including market competitiveness, business freedom, political globalization, bureaucratic quality and investment profile. FDI is considered an important driver for improving competitiveness, innovation, labor productivity and economic diversification, ultimately promoting economic growth; Therefore, the Saudi government should take various measures to attract FDI flows, ensuring a favorable business environment, including facilitating a comprehensive legislative structure and improving the quality of bureaucracy. Furthermore, Saudi Arabia is expected to expand more bilateral and multilateral agreements with various potential states in terms of trade and financial integration.

The above factors applicable to Saudi Arabia should also be considered by the government of Iraq to increase its FDI inflows. Factors influencing negatively FDI inflows in Iraq are a weak infrastructure, unfavorable investment regulations, political instability, and lack of security. A study by Al-Waely (2021) researched the clothing and textile sector in Iraq, citing war-wrecked, infrastructure and political instability as the reasons for making it difficult to attract investments. Similarly, other research findings pointed to non-conducive investment regulations and security instability in Iraq as obstacles that have made investors reluctant to invest. A study by Awada (2023) challenged the widely accepted argument that oil price volatility around the globe had a profound effect on FDI flows (even so energy market fluctuations leave a significant negative footprint on the economy in general). Her research established that changes in oil prices didn't affect the flows of FDI, specifically in the period of 2005-2020. Both Al-Waely and Awada recommended that in order to bolster Iraq's ability to attract consistent invest ents, the Iraqi administration needs to work on improving the investment climate and ensure political and economic stability. Moreover, according to the US Department of State's investment climate report on Iraq, foreign investors "continue to encounter bureaucratic challenges, corruption, and a weak financial services sector, making it difficult to conclude and implement investment deals (DOS, 2022). Particularly, in terms of discouraging regulations, the report says that as recent as April 2022, a time when the country witnessed election results disputes as well, investors experienced bureaucratic barriers to FDI, such as the country's precondition for acquiring a license that compels investors to deposit a significant amount of their capital in an Iraqi bank. Besides, the Iraqi government's preference for solely offering tenders and investment opportunities to State-Owned Enterprises (SOE) and state-controlled banks automatically discriminated against both private local and foreign investors, further discouraging them from investing in the country. In a qualitative study, Hanna et al (2014) verified all these factors. Her research found that lack of security, political instability, corruption and inadequate government policies towards FDI were deterrents to FDI's desired role in EG, adding these symptoms were shared by other post-conflict countries as well. All in all, the country's investment environment has thus become only attractive to investors with high appetites and tolerance for risk.

2.4. Government policies and incentives for attracting FDI in Iraq and Saudi Arabia

In Vision 2030 plan launched in 2016, Saudi Arabia considered diversifying its economy and reducing its dependence on oil revenues. Saudi Arabia has attracted FDI in the industrial sector, which has boosted economic growth, new job creation, new technologies and competitiveness. In 2021, the government implemented the National Investment Strategy aimed at multiplying FDI by twenty by 2030. Saudi Arabia has already enhanced its investment climate. The FDI Confidence Index ranked Saudi Arabia 6th in 2023 among emerging economies behind China, India, UAE, Qatar and Thailand and 23rd globally, showing its progress in attracting FDI (Hulak, 2023). Iraq did not feature in the

list of top 25 emerging economies ranked based on the FDI Confidence Index. The FDI confidence index is a weighted average of the number of high, medium, and low responses to questions regarding the likelihood of making a direct investment in the market over the next three years (Dyvik, 2023).

Regarding incentives for attracting FDI, Saudi Arabia has developed four Special Economic Zones (SEZs) in Riyadh, King Abdullah Economic City, Jazan and Ras Al-Khair. Saudi Arabia is increasingly requiring international companies who are considering investing in the country to maintain a regional headquarters within Saudi Arabia, the government planning to introduce new measures in this direction by 2024.

The Iraqi government has been keen to attract FDI and has accordingly taken steps in this regard, i.e. introducing reforms, modifying regulations, offering tax incentives and streamlining bureaucratic procedures. The Investment Law No. (13) of 2006 was precisely passed for this reason which also brought about the creation of the National Investment Commission (NIC) and Provincial Investment Commissions (PIC). Subsequent amendments, such as that in 2009 and 2015, further attempted to make the investment climate conducive for investors. The strive for further easing off the investment environment still continues. According to Dhaman (2023), National Investment Authority is slated to act on amending the Amended Investment No. 13 of 2006. In terms of commercial disputes adjudication that would help assure foreign companies, a system of commercial courts was also created, with the first established in 2010. Under the Investment Law, a foreign investor enjoys unlimited participation and is treated almost the same as an Iraqi investor. The law also awards a couple of exemptions for qualified investments, including a ten-year exemption from taxes and import duties (Ali and Jameel, 2021). Although there are some restrictions in terms of limits on foreign direct and indirect ownership of natural resources, especially their extraction and processing, all in all foreign investors are eagerly welcomed on paper. Nevertheless, there are factors and obstacles that hinder the application of the above regulations; notwithstanding the government promises, there has been no follow-through. These hindrances which also constrain the growth of private and non-oil sectors are none other than a weak political system and worries about security and social stability, as well as corruption, obsolete infrastructure, and lack of skilled labor (Lloyds Bank, 2019). In 2020, the Iraqi government introduced a roadmap called White Paper, in conjunction with international organizations such as World Bank and IMF, with one of the objectives being addressing the structural issues in terms of diversifying the economy and creating a welcoming environment to attract foreign investment and "…to apply international best practices in order to create an attractive environment for FDI…" (Iraq White Paper, 2020). A review of the White Paper's progress in two years since its inception by Shuker (2022) revealed that although the paper had been effective in achieving short-term gains – in part owing to windfall from higher global oil prices – structural issues were still not addressed. According to Shuker (2022), the revenues from oil had been primarily used for essential goods and services and contrary to the paper's objective, the resources weren't utilized to facilitate investment and industrial progress and thus there was no significant progress toward diversifying the economy away from oil dependency. She attributed the lack of progress on rolling out structural reforms to opposition from political parties which operate under an arrangement of respective natural resources' domination and clientelism. Currently, there are fears that the new government, which came into power in 2022 following a year-long election crisis, might abandon the paper without having an alternative reform map. On the other hand, foreign investors also do not consider the investment regulations favorable, especially when it comes to bureaucratic challenges and there are objections to the country's rulemaking process of commercial activity and investments, which is deemed opaque and arbitrary. For instance, the US Department of State's investment climate report on Iraq points to a lack of official notice of imposition of duties on citizens and businesses in a gazette as ministerial regulations do not require so, leading to arbitrary creation of procedures. Similarly, there is a lack of coordination between ministries and provincial officials on regulatory issues, whereas accounting and legal procedures not in tandem with international standards have at times resulted in slowed projects (DOS, 2022).

2.5. Sectors of Interest in Iraq and Saudi Arabia

Attracting foreign direct investment (FDI) in the Saudi industrial sector has been crucial since 2016 to help driving economic growth, create jobs, grow knowledge of new technologies, and enhance competitiveness.

Attracting FDI into the Saudi industrial sector has been crucial since 2016 to help drive economic growth, add jobs, increase knowledge of new technologies and improve competitiveness (Hulak, 2023).

To realize its long-term vision, Saudi Arabia has launched a series of transformational projects aimed at creating a sustainable future. It includes three main projects: 1) the creation of a futuristic megacity named Neom, that will integrate cutting-edge technology and promote innovation. Neom will feature 'The Line', a 170-kilometer linear city designed to have no streets, no cars, and no carbon emissions. 2) Oxagon's partially floating port city will revolutionize not only how cities are built, but also how industrial manufacturing and logistics work. 3) A Red Sea building luxury tourist destination along the untouched Red Sea coast by Red Sea Development Company, featuring a mega entertainment project in Qiddiya, expected to become the Saudi premium leisure and cultural hub. The Saudi government also plan to double the population of the city of Riyadh. These major projects will significantly increase the demand for industrial sector products in Saudi Arabia and

will boost industrial FDI. Saudi Arabia has also grown its manufacturing sector, growing from $67 billion in GDP in 2011 to $109 billion in 2021 (Hulak, 2023).

The World Bank categorizes Iraq as one of the most oil-dependent countries in the world. According to the organization, oil revenues for the past decade made up 99% of exports, 85% of national budget and 42% of GDP. Due to this abundance of the resource, the FDI has also concentrated in this sector, putting the country at various economic risks due to lack of diversification. Although there are calls and efforts to diversify such as that within the White Paper recommendations, it has been an uphill battle so far. In addition to oil and gas, foreign companies have shown interest in other sectors beyond the oil. Some of these sectors include Real Estate, Chemicals, Building and Construction Materials, Hotels and Tourism and Telecommunications. However, the FDI inflows into those countries are significantly low compared to oil.

2.6. Wavelet analysis applied to forecasting.

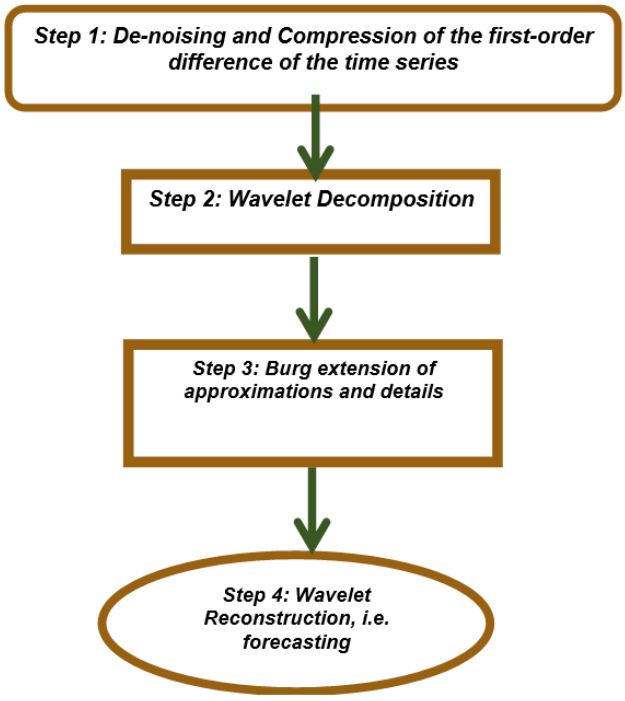
In conclusion of the literature review section, wavelet analysis applied to forecasting is briefly reviewed since this model is used to generate forecasts in this paper. Wavelet analysis has been primarily applied to physical phenomena such as electrical, audio or seismic signals which propagate through space in waveforms. Wavelet analysis has also been applied in finance and economics since interest rates, exchange rates, volatility of asset returns, gross domestic product, levels of employment or consumer spending propagate through time in waveforms. For example, the versatility of wavelet analysis for forecasting financial time series was illustrated by Rostan and Rostan (2018a). In addition, Rostan and Rostan (2019) identified when the European Muslim population will become a majority in Europe with wavelet analysis. Rostan et al. (2015) appraised the financial sustainability of the Spanish pension system, and Rostan and Rostan followed the same methodology regarding the Saudi pension system using wavelet analysis (2018b). Wavelet analysis was applied to the forecast of economic time series such as the Spanish economy (Rostan and Rostan, 2018c), as well as Greek (Rostan and Rostan, 2018d), Saudi (Rostan and Rostan, 2021a, 2024b, Rostan et al., 2023), Austrian (Rostan and Rostan, 2020), Persian Gulf (2022a), Turkish (2022b), UK (2022c) Australian (2024a), South Korea's (2023b), Cyprus' (2023c), Brazil's, Mexico's and Argentina's economies (2024b), Slovenia's (2024d) and the Eurozone's (Rostan et al., 2024) economies. Interest rates were forecasted with wavelet analysis due to their valuable property of propagating through time in waveforms (Rostan et al., 2017). In addition, fossil fuels price estimates (Rostan and Rostan, 2021b), solid waste of OECD countries (2023d), and population estimates (Rostan and Rostan, 2017) were forecasted with wavelet analysis as well as global temperatures (Rostan and Rostan, 2023a).

The methodology used in this article is presented in the next section.

3. Methodology

This paper tracks foreign direct investment (FDI) in Iraq, benchmarked to Saudi Arabia, with historical data from 1970 to 2022 and forecasts to 2100. Forecasts are generated using a wavelet analysis forecasting model whose methodology follows four steps illustrated in the flowchart below (Figure 1). A detailed methodology can be found in Rostan and Rostan (2022b).

Figure 1: Flowchart of the methodology from steps 1 to 4.



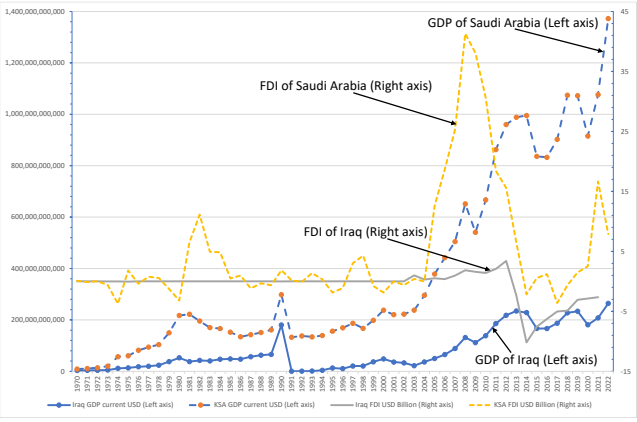
4. Results

This section provides answers to the research problem which aims to analyze and understand the dynamics of foreign direct investments (FDI) in Iraq. Solutions will be to analyze historical data during the 1970-2022 period as well as forecast estimates for the next 78 years up to 2100 of variables that have a direct relationship with FDI, namely GDP and crude oil price, since GDP is the single most important indicator to capture economic activity of a country (Callen, 2024) and crude oil price since Iraq is an oil-producing country belonging to the top five oil producing countries in the world, with 5.5% share of the world crude oil production in 2022 (U.S. Energy Information Administration, 2024), its economy driven mainly by the oil sector. To bring more perspective to the analysis, Iraqi variables are benchmarked to Saudi ones. The theoretical contribution of this research will be to bring more insight into the dynamics of FDIs in Iraq and Saudi Arabia, their relationship in the past and in the future using historical data and forecast estimates obtained from an innovative wavelet analysis forecasting model. Section 4.1. focuses on historical data, sections 4.2. and 4.3. on forecast estimates.

4.1. Analyzing historical data

Figure 2 illustrates the historical time series of Annual FDIs (billion US$) and Annual GDPs (current US$) of Iraq and Saudi Arabia from 1970 to 2022.

Figure 2: Annual FDIs (billion US$) and Annual GDPs (current US$) time series of Iraq and Saudi Arabia from 1970 to 2022.



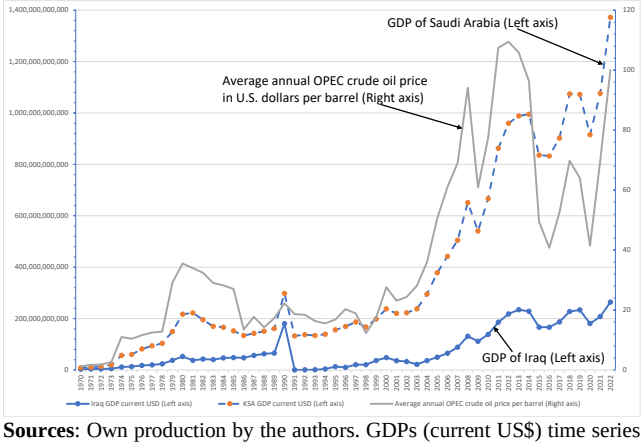
Sources: Own production by the authors. FDIs (billion US$) time series of Iraq (https://www.macrotrends.net/countries/IRQ/iraq/foreign-direct-investment) and Saudi Arabia (https://www.macrotrends.net/countries/SAU/saudi-arabia/foreign-direct-investment) from Macrotrends website; GDPs (current US$) time series of Iraq (https://fred.stlouisfed.org/series/MKTGDPIQA646NWDB) and Saudi Arabia (https://fred.stlouisfed.org/series/MKTGDPSAA646NWDB) from FRED Economic Data website, St. Louis Federal Reserve.

According to Figure 2, since 1970, FDI in Saudi Arabia has experienced four major inflows represented by 4 peaks, one in 1982 (+11.13 billion US dollars), others in 1998 (+4.28), 2008 (+39.46) and 2021 (+19.29). The peak in 2008 was explained by the launch of a new Foreign Investment Act and the establishment of the Saudi Arabian General Investment Authority in 2000 resulting in FDI inflows rising to a record high of $39.46bn in 2008 (Whiteaker, 2020). Saudi GDP has grown at a sustainable rate since 1988 and reached a record high in 2022. Focusing on Saudi Aramco, the largest oil company in the world, 1988 was the year when Saudi Aramco became 100% state-owned. In December 2019, Saudi Aramco raised US$25.6 billion in its Initial Public Offering (IPO), making it the world's largest IPO. In May 2022, Saudi Aramco became the largest company in the world by market capitalization, surpassing Apple Inc. (Wearden, 2022). In March 2023, Saudi Aramco announced a record profit of $161.1bn for 2022, helped by soaring energy prices and bigger volumes as prices of oil soared following the COVID-19 pandemic. Saudi Aramco's profit eclipsed the profits posted by ExxonMobil and Shell, who reported $55.7 and $39.9 billion respectively (BBC, 2023). Aramco also declared a dividend of $19.5bn. Most of this amount went to the Saudi government as it owned almost 95% of the company's shares at the end of 2022. Saudi Aramco is undoubtedly the backbone of the oil industry in Saudi Arabia and a driving force of its economy.

The Saudi annual GDP growth rate over the period 1988-2022 has been +7.72%. According to the Global 500 Companies (Fortune, 2022), Saudi Aramco was the second largest global company by revenue in 2022, behind Walmart, the American retail and e-commerce giant. Saudi Aramco, like all large-scale fossil fuel producers, saw its revenue rise as oil supply tightened in 2022, partly because of the war in Ukraine, WTI crude oil price rising to a high of about $122 a barrel in June 2022 and by the end of 2023 partly because of the war between Palestine and Israel, WTI crude oil price rising to a high of about $85 by October 7, 2023 when the militant group Hamas launched an incursion in Israel, killing and injuring thousands of people.

FDI in Iraq has been more modest, close to zero between 1970 and 2003, 2003 being the year of the invasion of Iraq by American troops and of the fall of Saddam Hussein who served as the fifth president of Iraq from 1979 to 2003. FDI reached two peaks thereafter, in 2008 (+1.86) and in 2012 (+3.4), then entering negative territories between 2013 and 2021 to reach a low of -10.18 in 2014. Negative FDI positions largely arise when the subsidiary's loans to its parent company exceed the loans and equity provided by the parent company to the subsidiary. This is more likely to happen when FDI statistics are presented by partner country (OECD, 2023). Iraq's GDP has grown at a sustainable rate since 2003 and reached a record high in 2022. The annual GDP growth rate over the period 2003-2022 has been +13.99% and, for comparison with Saudi Arabia the annual GDP growth rate over the period 1988-2022 has been +4.32% (versus +7.72% with Saudi Arabia). As mentioned earlier, the size of the Saudi economy in terms of GDP (current US$) was 4 times larger than Iraq in 2022.

Figure 3: Annual GDP (current US$) time series of Iraq and Saudi Arabia and Average annual OPEC crude oil price (in U.S. dollars per barrel) from 1970 to 2022.



Sources: Own production by the authors. GDPs (current US$) time series of Iraq (https://fred.stlouisfed.org/series/MKTGDPIQA646NWDB) and Saudi Arabia (https://fred.stlouisfed.org/series/MKTGDPSAA646NWDB) from FRED Economic Data website, St. Louis Federal Reserve. Average annual OPEC crude oil price (in U.S. dollars per barrel, https://www.statista.com/statistics/262858/change-in-opec-crude-oil-prices-since-1960/) from Statista website.

As Figure 3 illustrates, the GDPs of Saudi Arabia and Iraq have grown at a sustainable rate since 1988 and reached a

record high in 2022. The annual growth rate of GDP over the period 1988-2022 was +7.72% in Saudi Arabia and +4.32% in Iraq. This trend is explained by the fact that the annual price of OPEC crude oil saw a low in 1988 at 14.24 USD per barrel, reaching an all-time high of 109.45 USD in 2012 in the aftermath of the global 2008-2009 credit crisis, when the global economy restarted, creating a technical "W" uptrend pattern over the period 2012-2022 with 2 lows in 2016 (40.76 USD) and 2020 (41.47 USD) and subsequently soared to reach 100.08 USD in 2022. The annual growth rate of the oil price over the period 1988-2022 was +5.90%. The GDPs of Saudi Arabia and Iraq, driven by the price of oil, were driven up by the price of oil during this period. As a reminder, revenue minus the cost of oil production expressed as a percentage of GDP was estimated in 2021 at 42.79% for Iraq and 23.69% for Saudi Arabia.

Table 1: Correlation matrix between Annual FDIs (billion US$), Annual GDP (current US$) time series of Iraq and Saudi Arabia and Average annual OPEC crude oil price (in U.S. dollars per barrel) from 1970 to 2022.

	Iraq GDP current USD	KSA GDP current USD	Iraq FDI USD Billion	KSA FDI USD Billion	Average OPEC crude oil price (U.S. dollars per barrel)
Iraq GDP current USD	1				
KSA GDP current USD	0.93	1			
Iraq FDI USD Billion	-0.51	-0.52	1		
KSA FDI USD Billion	0.43	0.49	0.12	1	
Average OPEC crude oil price (U.S. dollars per barrel)	0.84	0.87	-0.2	0.67	1

The correlation matrix presented in Table 1 confirms the fact that the price of oil drives the economies of Iraq and Saudi Arabia, the correlation between the price of oil and GDP over the period 1970-2022 being +87% with the GDP of Saudi Arabia and +84% with that of Iraq. GDPs of the two countries over the period have a very strong and positive relationship with a coefficient of +93%. FDI and GDP have a positive relationship in Saudi Arabia (+49%) and a negative one in Iraq (-51%). This suggests that we cannot generalize about the relation between FDI and GDP, this is on a case-by-case basis depending on the country. A larger FDI drives positively GDP in Saudi Arabia and negatively in Iraq. Assuming that the GDP growth rate is an indicator of the health of a given country's economy and its economic growth, the positive impact of FDI on economic growth has been evidenced by authors, as presented in the following literature review section. Based on Table 1, this relationship is confirmed in Saudi Arabia but not in Iraq.

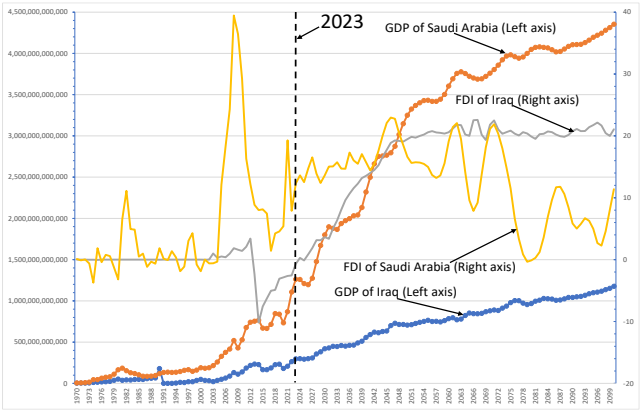
Finally, FDI and oil price have a positive relationship in Saudi Arabia (+67%) and a weak and negative one in Iraq (-20%). This suggests that oil price drives FDI in Saudi Arabia and has a marginal effect on FDI in Iraq.

4.2. Generating 2023-2100 Forecasts of Foreign Direct Investments and GDPs of Iraq and Saudi Arabia.

Figure 4 illustrates 2023-2100 forecasts with wavelet analysis of Foreign Direct Investments (billion US$) and GDPs (current US$) of Iraq and Saudi Arabia.

According to Figure 4, thanks to ongoing reforms since 2016, Saudi Arabia's GDP is expected to grow exponentially between 2023 and 2100, experiencing an annual growth rate of +1.76% over the next 78 years. In 2100, GDP is expected to be 3.92 times the 2022 GDP. FDI is expected to grow steadily from 2022 to 2046 to peak at +$22.97 billion, then decline sinusoidally thereafter, averaging +11.35 billion dollars between 2047 and 2100. In total, between 2023 and 2100, FDI is expected to average +12.71 billion dollars.

Figure 4: 2023-2100 Forecasts of Foreign Direct Investments (billion US$) and GDPs (current US$) of Iraq and Saudi Arabia (78 annual forecasts) generated with historical data from 1970 to 2022.



Source: Own production by the authors using Matlab.

Iraq's GDP is expected to grow steadily between 2023 and 2100, experiencing an annual growth rate of +1.93% over the next 78 years. In 2100, GDP is expected to be 4.45 times the 2022 GDP. FDI is expected to grow steadily from 2022 to 2067, peaking at +$22.58 billion, then stabilizing thereafter at +$20.65 billion on average between 2068 and 2100. Overall, between 2023 and 2100, FDI is expected to average +16.85 billion dollars.

Comparing Saudi Arabia and Iraq, in 2022, Saudi GDP was 4.19 times higher than Iraqi GDP and is expected to be 3.70 times higher by 2100. Saudi Arabia is then expected to consolidate its position as first economy of the Persian Gulf, vying with Iran for the pole (see Rostan & Rostan, 2022a). Iraqi FDI between 2023 and 2100 is expected to average +16.85 billion dollars compared to an average of +12.71 billion for Saudi Arabia. Iraq is expected to follow in Saudi Arabia's footsteps in terms of reforms and will learn from its older sister, Saudi Arabia, how to implement reforms and diversify its economies and then, to attract FDI. In section

2.2, the Economic Complexity Index (ECI) ranked Saudi Arabia and Iraq 31st and 112th respectively globally in 2021. As mentioned, the ECI aims to explain the knowledge accumulated in a population, the knowledge expressed in the economic activities present in the country. Higher economic complexity relative to a country's income level stimulates economic development. Saudi Arabia has successfully strengthened its production capabilities to enter new sectors that will drive growth in the years to come. Iraq has failed to diversify its know-how and faces weak growth prospects in the coming years, but based on forecasts of the present research, Iraq should learn to increase economic complexity and then attract FDI.

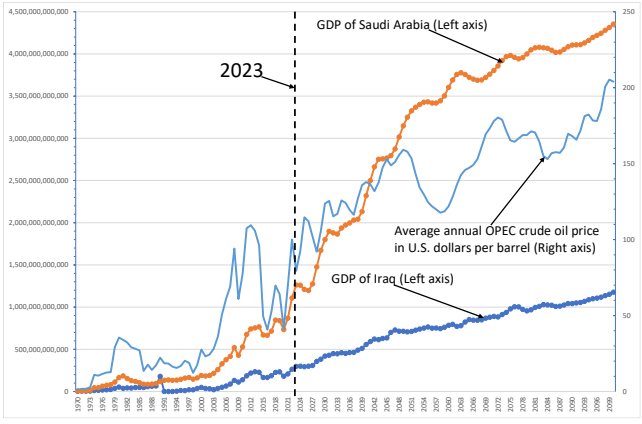
4.3. Generating 2023-2100 Forecasts of GDPs of Iraq and Saudi Arabia and oil price.

Figure 5 illustrates 2023-2100 forecasts with wavelet analysis of GDPs of Iraq and Saudi Arabia and oil price.

As mentioned earlier, according to Figure 4 and Figure 5, thanks to ongoing reforms since 2016 aimed at diversifying the Saudi economy and reducing its dependence on oil revenues, Saudi Arabia's GDP is expected to grow exponentially between 2023 and 2100, with an expected annual growth rate of +1.76% over the next 78 years, but is expected to reduce its dependence on oil represented by a drop in the correlation with the oil price to 82% compared to 87% in previous years (see Table 2). However, due to the still high correlation of 82% in the coming years, Saudi Arabia's economy is still expected to be dominated by oil and its associated industries. Oil rents (i.e. the difference between the value of crude oil production at regional prices and total production costs) as a percentage of GDP represented 23.7% for Saudi Arabia in 2021, while that they represented 42.8% for Iraq (World Bank, 2024).

The Iraqi economy is expected to be centered on the oil industry in the coming years, with the correlation coefficient with the price of crude oil expected to increase from 84% to 87%. The bullish trend of the price of crude oil is expected to boost the Iraqi economy, which is expected to experience an annual growth rate of +1.93% over the next 78 years.

Figure 5: 2023-2100 Forecasts of GDPs (current US$) of Iraq and Saudi Arabia and Average annual OPEC crude oil price (in U.S. dollars per barrel). 78 annual forecasts generated with historical data from 1970 to 2022 and wavelet analysis.



Source: Own production by the authors using Matlab.

Overall, Saudi and Iraqi economies will move in phase in future years, the correlation coefficient between GDPs is expected to increase to 98% in coming years compared to 93% in the past.

Table 2: Correlation matrix between Annual FDIs (billion US$), Annual GDP (current US$) time series of Iraq and Saudi Arabia and Average annual OPEC crude oil price (in U.S. dollars per barrel) from 2023 to 2100 [in brackets are the historical correlation coefficients from 1970 to 2022].

	Iraq GDP current USD	KSA GDP current USD	Iraq FDI USD Billion	KSA FDI USD Billion	Average OPEC crude oil price (U.S. dollars per barrel)
Iraq GDP current USD	1				
KSA GDP current USD	0.98[0.93]	1			
Iraq FDI USD Billion	0.86 [-0.51]	0.93 [-0.52]	1		
KSA FDI USD Billion	-0.54 [0.43]	-0.44 [0.49]	-0.20 [0.12]	1	
Average OPEC crude oil price (U.S. dollars per barrel)	0.87[0.84]	0.82[0.87]	0.73[-0.20]	-0.41 [0.67]	1

Source: Own production by the authors using Excel.

According to Table 2, FDI in Iraq had a negative and moderate correlation with GDP between 1970 and 2022 (-51%). FDI was not a driver of economic growth. The relationship between these two variables will reverse in the years to come, reaching +86%. FDI will be a key driver of growth in the Iraqi economy. FDI will mainly finance the oil sector represented by the strong correlation between FDI and oil prices in the years to come (+73%).

The story of Saudi Arabia is the opposite. FDI in Saudi Arabia had a positive and moderate correlation with GDP between 1970 and 2022 (+49%). FDI remained an engine of economic growth. The relationship between these two variables will reverse in the years to come, reaching -44%. The growing economy will be self-sufficient, being able to generate enough cash flow so that the economy no longer depends on FDI for growth.

5. Conclusion and Discussion

The objective of the paper is to track Foreign Direct Investment (FDI) in Iraq, benchmarked to Saudi Arabia, with historical data (from 1970 to 2022) and forecasts until 2100.

Iraq and Saudi Arabia are two oil-based economies, ranked fifth and second respectively in terms of oil reserves and sixth and second oil producers in the world. In 2022, the size of the Saudi economy, as represented by its GDP, was 4.19 times larger than that of Iraq.

Saudi Arabia has already implemented reforms since 2016 aimed at diversifying the Saudi economy and reducing its dependence on oil revenues, while the Iraqi economy is still centered on the oil industry. In 2021, oil rents (i.e., the difference between the value of crude oil production at regional prices and total production costs) as a percentage of GDP represented 23.7% for Saudi Arabia, while they represented 42.8% for Iraq, almost double. This shows the greater dependence of the Iraqi economy on the oil industry.

Based on forecasts generated by a wavelet analysis forecasting model, Iraqi FDI between 2023 and 2100 is expected to average +$16.85 billion, compared to Saudi Arabia's average of +12.71 billion. Iraq is expected to follow in Saudi Arabia's footsteps in terms of reforms and will learn from its older sister Saudi Arabia how to implement reforms and diversify its economies and then attract FDI. The Economic Complexity Index (ECI) ranked Saudi Arabia and Iraq 31st and 112th respectively globally in 2021. The ECI aims to explain the knowledge accumulated within a population and the knowledge expressed in economic activities present in the country. Higher economic complexity relative to a country's income level stimulates economic development. Saudi Arabia has successfully strengthened its production capabilities to enter new sectors that will drive growth in the years to come. Iraq has failed to diversify its know-how and faces low growth prospects in the coming years, but based on the predictions of this research, Iraq should learn to increase economic complexity and then attract FDI.

Thanks to ongoing reforms, Saudi Arabia's GDP is expected to grow exponentially between 2023 and 2100 with an expected annual growth rate of +1.76% over the next 78 years but should reduce its dependence on oil represented by a drop in the correlation with the oil price to 82% compared to 87% in previous years. However, due to a still high correlation of 82% in the coming years, the Saudi economy is still expected to be dominated by oil and its associated industries. The Iraqi economy is expected to continue to be centered on the oil industry in the coming years, with the correlation coefficient with the price of crude oil expected to increase from 84% to 87%. The upward trend in crude oil prices is expected to boost the Iraqi economy, which is expected to experience an annual growth rate of +1.93% over the next 78 years. Overall, the Saudi and Iraqi economies will move in sync in the coming years, with the correlation coefficient between GDP expected to increase to 98% in the coming years from 93% in the past.

Focusing on the relationship between FDI, GDP and oil price, FDI in Saudi Arabia had a positive and moderate correlation with GDP between 1970 and 2022 (+49%). FDI remained an engine of economic growth. The relationship between these two variables will reverse in the years to come, reaching -44%. The growing economy will be self-sufficient, being able to generate enough cash flow so that the economy no longer depends on FDI for growth. The story of Iraq is the opposite. FDI in Iraq had a negative and moderate correlation with GDP between 1970 and 2022 (-51%). FDI was not an engine of economic growth. The relationship between these two variables will reverse in the years to come, reaching +86%. FDI will be a key driver of growth in the Iraqi economy. FDI will mainly finance the oil sector represented by the strong correlation between FDI and oil prices in the years to come (+73%).

As policy recommendations related to the study's findings, the authors strongly advise Iraqi leaders to align their reforms with those implemented by Saudi Arabia, which has implemented the Vision 2030 plan since 2016, bringing since then numerous awards to the Saudi economy. Diversifying the Iraqi economy away from the oil sector will bring sustainability to the Iraqi economy, currently driven by the oil sector and affected by oil price volatility and will boost FDI by opening the appetite of foreign investors, eager to invest in growing economies supported by winning reforms.

Future research could aim to identify other drivers of FDI, specifically linked to oil-producing countries.

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