KARADENIZ TECHNICAL UNIVERSITY * SOCIAL SCIENCES INSTITUTE

DEPARTMENT OF ECONOMICS

PhD PROGRAM

DUTCH DISEASE IN SELECTED MENA COUNTRIES

PhD THESIS

Djallel AIMAR

DECEMBER - 2024

TRABZON

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Thesis Supervisor: Prof. Dr. Ayça SARIALİOĞLU HAYALİ

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APPROVAL

Upon the submission of the dissertation, **Djallel AIMAR** has defended the study **"Dutch Disease in Selected MENA Countries"** in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Economics at Karadeniz Technical University, and the study has been found fully adequate in scope and quality as a thesis by **unanimous/ majority** vote on **08 /01/2025**.

Committee Member		**Decision**		**Signature**
Title - Name and SURNAME	**Mission**	**Accept**	**Refuse**	
Prof. Dr. Ayça SARIALİOĞLU HAYALİ	Supervisor	☐	☐	
Prof. Dr. Rahmi YAMAK	Member	☐	☐	
Prof. Dr. Murat Can GENÇ	Member	☐	☐	
Prof. Dr. Elif NUROĞLU	Member	☐	☐	
Prof. Dr. Rıfat Barış TEKİN	Member	☐	☐	

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PREFACE

Economics, at its core, seeks to understand the delicate interplay between opportunity and consequence; the Dutch Disease epitomises this tension. While resource wealth, such as oil, is often hailed as an economic boon, it can distort economies, creating vulnerabilities that impede long-term sustainable development. However, the challenge lies not in the abundance of resources but in their management. Wealth transforms into a “disease” when there is an absence of a visionary approach that balances short-term benefits with long-term stability.

Traditionally associated with natural resource economies, Dutch Disease extends beyond this to any significant and sustained inflow of foreign capital, whether through aid, remittances, investment, or technological advancements, which can trigger similar economic distortions. These inflows may foster over-reliance on booming sectors, erode competitiveness in tradeable industries, and create structural imbalances. The core mechanism driving these distortions is the shift in relative prices, particularly the appreciation of the real exchange rate, which undermines export competitiveness. Furthermore, resource reallocation toward booming sectors exacerbates the decline of traditional industries, leaving economies vulnerable to external shocks.

This study bridges theory with the lived realities of nations facing challenges from foreign capital inflows, providing a comprehensive perspective on navigating economic dependence complexities. The original contributions of this study include considering both de-industrialisation and de-agriculturalisation simultaneously and exploring Dutch Disease’s main symptoms across selected MENA economies, both oil-rich and oil-poor.

This intellectual pursuit would not have been possible without the invaluable guidance and unwavering support of my esteemed supervisor, Prof. Dr. Ayça SARIALİOĞLU HAYALİ. I also extend my deepest thanks to Prof. Dr. Rahmi YAMAK and Prof. Dr. Murat Can GENÇ, whose mentorships have been instrumental in shaping the trajectory of this research.

Finally, I owe profound gratitude to my family, whose compassion has been my anchor throughout this journey. I also offer my deepest thanks to the rare and remarkable individuals whose inspiration, valour, confidence, integrity, and vibrancy have guided me through moments of doubt and discovery.

December, 2024 Djallel AIMAR

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ABSTRACT

This study examines the phenomenon of Dutch Disease in selected Middle East and North Africa (MENA) countries, focusing on the Resource Movement and Spending Effects in Algeria and Saudi Arabia as oil-rich countries and Morocco and Tunisia as oil-poor countries within the region. Using data from 1980 to 2020, the research investigates the effects of foreign capital influxes, specifically oil rents and remittances, on the Real Effective Exchange Rate (REER) and sectoral value-added shares. The Autoregressive Distributed Lag (ARDL) model is used to figure out how oil rents, remittances, and REER are related, along with changes in agriculture, manufacturing, and services sectors value added. Additionally, control variables like Terms of Trade (TOT), Real Interest Rate (RIR), and Trade Openness (TOP) are also included to account for other influences on the dependent variables, enhancing the understanding of external factors, monetary policy, and economic integration. The findings confirm the presence of Dutch disease symptoms with varying degrees of impact across the sectors in the selected MENA countries. In Algeria and Saudi Arabia, oil rents did not significantly affect the REER in the long term, suggesting that exchange rate appreciation from oil windfalls is not a major issue in these countries. Furthermore, it was found that Algeria's manufacturing sector remained resilient, while its agricultural sector experienced de-agriculturalisation due to labour shifts driven by oil revenues. Conversely, Saudi Arabia's manufacturing sector exhibited de-industrialisation, whereas its agricultural sector expanded over time, differing from Algeria's experience. In the services sector, both Algeria and Saudi Arabia showed limited effects from oil rents, with no disproportionate expansion or labour absorption at the expense of other sectors. For the oil-poor countries, Morocco and Tunisia, the findings reveal that remittance inflows did not lead to REER appreciation. However, Morocco experienced de-industrialisation and de-agriculturalisation due to foreign inflows, weakening its industrial and agricultural bases. On the other hand, Tunisia displayed resilience, with remittances having a neutral effect on both manufacturing and a positive impact on agriculture in the long term. The services sector in both countries did not experience a disproportionate expansion, underscoring the complex dynamics between resource and remittance inflows and sectoral outcomes.

Keywords: Dutch Disease, MENA, Oil Rents, Remittances, ARDL Model

ÖZET

Bu çalışma, seçilmiş Orta Doğu ve Kuzey Afrika (ODKA) ülkelerinde Hollanda Hastalığı olgusunu incelemekte olup, bölgedeki petrol zengini ülkeler olarak Cezayir ve Suudi Arabistan ile petrol fakiri ülkeler olarak Fas ve Tunus'ta kaynak hareketi ve harcama etkilerine odaklanmaktadır. 1980-2020 dönemine ait verileri kullanan araştırma, özellikle petrol gelirleri ve döviz girdisi olan işçi dövizlerinin Reel Efektif Döviz Kuru (REER) ve sektörel katma değer üzerindeki etkilerini araştırmaktadır. Petrol gelirleri, işçi dövizleri ve REER arasındaki ilişkilerin yanı sıra tarım, imalat ve hizmet sektörlerindeki değişimlerin analiz edilmesinde Otoregresif Gecikmeli Dağıtılmış (ARDL) modelinden yararlanılmıştır. Ayrıca, dış faktörler, para politikası ve ekonomik entegrasyonun etkilerini daha iyi anlamak için Ticaret Hadleri, Reel Faiz Oranı ve Ticaret Açıklığı gibi kontrol değişkenleri de modele dahil edilmiştir. Bulgular, seçilmiş ODKA ülkelerinde sektörlere göre değişen derecelerde Hollanda Hastalığı belirtilerini doğrulamaktadır. Cezayir ve Suudi Arabistan'da petrol gelirlerinin uzun vadede REER üzerinde önemli bir etkisi olmadığı tespit edilmiştir, bu da petrol gelirlerinden kaynaklanan döviz kuru değerlenmesinin bu ülkelerde büyük bir sorun olmadığını göstermektedir. Ayrıca, Cezayir'in imalat sektörünün dirençli kaldığı, ancak petrol gelirlerinin iş gücünü tarım sektöründen uzaklaştırması nedeniyle tarım sektöründe tarım dışılaşma yaşandığı bulunmuştur. Buna karşılık, Suudi Arabistan'da imalat sektörü sanayisizleşme belirtileri gösterirken, tarım sektörü zamanla büyümüş ve bu durum Cezayir'in deneyiminden farklılık göstermiştir. Hizmet sektöründe ise hem Cezayir hem de Suudi Arabistan'da petrol gelirlerinin sınırlı etkileri gözlemlenmiş olup, diğer sektörler aleyhine orantısız bir genişleme veya iş gücü çekişi yaşanmamıştır. Petrol fakiri ülkeler olan Fas ve Tunus için ise bulgular, işçi dövizleri girişlerinin REER'de değerlenmeye yol açmadığını göstermektedir. Ancak, Fas'ta yabancı girdiler nedeniyle sanayisizleşme ve tarım dışılaşma yaşanmış ve bu durum ülkenin sanayi ve tarımsal temellerini zayıflatmıştır. Diğer yandan Tunus, işçi dövizlerinin uzun vadede imalat sektörü üzerinde nötr, tarım üzerinde ise olumlu bir etkiye sahip olmasıyla direnç göstermiştir. Her iki ülkede de hizmet sektöründe orantısız bir genişleme yaşanmamış olup, kaynak ve işçi dövizlerinin sektörel sonuçlar üzerindeki karmaşık dinamikleri vurgulanmaktadır.

Anahtar Kelimeler: Hollanda Hastalığı, ODKA, Petrol Gelirleri, İşçi Dövizleri, ARDL Sınır Testi

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LIST OF ACRONYMS

ADF	: Augmented Dickey-Fuller
AGR	: Agricultural Sector
ARDL	: Autoregressive Distributed Lag
DDE	: Dutch Disease Effect
DSGE	: Dynamic Stochastic General Equilibrium
DZD	: Algerian Dinar
ECT	: Error Correction Term
ERR	: Exchange Rate Regimes
ESCW	: United Nations Economic and Social Commission for Western Asia
FDI	: Foreign Direct Investment
GCC	: Gulf Cooperation Council
GDP	: Gross Domestic Product
GNI	: Gross National Income
HAC	: Heteroskedasticity and Autocorrelation Consistent
IEA	: International Energy Agency
ILO	: International Labour Organisation
IMF	: International Monetary Fund
IRENA	: International Renewable Energy Agency
LM	: Lagrange Multiplier
MAN	: Manufacturing Sector
MMbpd	: Million Barrels of Oil and Condensate Per Day
NCUSAR	: National Council on U.S.-Arab Relations
NEER	: Nominal Effective Exchange Rate
ODA	: Official Development Assistance
OECD	: Organisation For Economic Co-Operation and Development
OILRENTS	: Oil Rents
OPEC	: Organisation of the Petroleum Exporting Countries
PMG	: Pooled Mean Group
PP	: Phillips-Perron
PPP	: Purchasing Power Parity
REER	: Real Effective Exchange Rates
REM	: Remittances
RER	: Real Exchange Rate

RIR	: Real Interest Rate
SAMA	: Saudi Arabian Monetary Agency
SAR	: Saudi Riyal
SDR	: International Monetary Fund’s Special Drawing Rights
SER	: Services Sector
TED	: Conference Board Total Economy Database
TOP	: Trade Openness
TOT	: Terms of Trade
UAE	: United Arab Emirates
UK	: United Kingdom
UN	: United Nations
US	: United States
USD	: United States Dollar
WB	: World Bank
WTI	: West Texas Intermediate

INTRODUCTION

For decades, classical economic theory, particularly the works of Adam Smith and David Ricardo, posited that nations rich in natural resources would outperform those without; for that reason, early economic models celebrated the wealth generated by resource abundance, assuming it would naturally lead to greater prosperity. However, by the late 20th century, this optimistic narrative began to shift with the rise of the “Dutch Disease” phenomenon (Czech, 2018: 253).

The Dutch Disease term, coined by the English journal The Economist in 1977, referred to the economic challenges faced by the Netherlands after the discovery of natural gas in the North Sea in the 1950s. Prior to this windfall, the Netherlands had a well-diversified economy, with non-gas tradeable sector exports (agricultural and manufacturing) accounting for over 75% of GDP. However, the excessive earnings from gas extraction led to a strong appreciation of the exchange rate, a reduction in the industrial sector (de-industrialisation), a drop in the export of traditional tradeable sectors, a price boost in non-tradeable goods and services, and an unprecedented increase in the unemployment rate (Fattah, 2020). Driehuis (1986) emphasised that unemployment in the Netherlands jumped from less than 1% in the 1960s to more than 15% in 1984. This experience highlighted a paradox where resource-rich economies struggle with de-industrialisation and economic imbalance (Hutchison, 1994).

Dutch Disease typically arises when a sudden influx of wealth from natural resources, such as oil or gas, causes an appreciation of the domestic currency. This, in turn, leads to a decline in the competitiveness of the manufacturing and agricultural sectors, commonly referred to as the “Spending Effect.” Additionally, the “Resource Movement Effect” also may occur when labour and capital shift from non-resource sectors to the booming resource sector, further undermining manufacturing and agricultural sectors (Corden & Neary, 1982). Over time, this reallocation weakens long-term economic growth and stability, as seen in several resource-rich nations (Sachs, 1995). This paradox has gained prominence in studies examining the “natural resource curse,” which describes the pattern of lower growth rates observed in resource-abundant countries compared to resource-poor economies like Japan and South Korea (Auty, 1993).

The “natural resource curse” is a paradox where countries rich in natural resources, paradoxically, often find themselves lagging economically compared to those less endowed. This intriguing phenomenon is particularly prevalent in nations heavily reliant on oil, leading to the term “oil curse” (Badeeb *et al.,* 2017). The reasons behind the resource curse are multifaceted, involving both economic and political factors. Economically, the concept of Dutch Disease is one of the most important factors, where the booming resource sector overshadows and distorts the non-resource sectors, leading to an imbalanced economy. Politically, issues like rent-seeking behaviour, weak institutions, and corruption amplify the negative impacts of resource dependence (Iimi, 2007).

The Netherlands' experience in the 1970s was not unique, since several countries, including the United Kingdom (UK) and Norway, encountered similar economic challenges following resource booms during the same period. Consequently, the literature on Dutch Disease expanded significantly. Furthermore, in recent decades, the Middle East and North Africa[1] (MENA) region has also provided fertile ground for studying Dutch Disease, especially as oil-rich economies began facing analogous challenges as a result of oil dependency. It is well known that while oil in the MENA region has played a central role in shaping the economies of these countries, however, it has also simultaneously exposed them to the vulnerabilities associated with resource dependence (Frankel, 2010).

A key indicator of Dutch Disease is how much an economy relies on natural resources, which is commonly measured by comparing the share of natural resource rents to the country's overall GDP or by the percentage of a country's total export revenue that comes from natural resources (Auty, 2007; Dietz *et al.,* 2007). In the MENA region, the symptoms of Dutch Disease are particularly evident. As the largest crude oil and oil products exporter globally, the region's economies are heavily reliant on hydrocarbons. For example, oil and gas revenues in 2019 accounted for 44% of GDP in Libya, 42% in Kuwait, 24% in Saudi Arabia, and 14% in Algeria. Despite this wealth, many MENA nations have experienced high unemployment rates, de-industrialisation, and high inflation rates (Abdlaziz *et al.,* 2018). In addition to that, from 1975 to 2000, nations that rely significantly on oil like Algeria, Iran, and Saudi Arabia saw a 29% drop in average per capita income, while the global average rose by 34% (Nili & Rastad, 2007).

However, it is overly simplistic to attribute MENA's economic problems solely to its reliance on oil. Many resource-poor MENA countries, like Egypt, Jordan, Morocco, and Tunisia, have also had similar symptoms, though their economies are different and they depend on other foreign flows, like worker remittances and tourism. These countries have also faced de-industrialisation and slower economic growth despite their lack of significant natural resources. Therefore, comprehending the Dutch Disease in MENA necessitates a comprehensive examination that considers factors beyond the dependence on oil.

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[1] Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Yemen, Syria, Oman, Qatar, Saudi Arabia, the United Arab Emirates (UAE), Tunisia, the West Bank and Gaza.

Previous investigations of Dutch Disease in the MENA region have shown diverse and occasionally conflicting results, revealing varying intensities of Dutch Disease manifestations, including Real Exchange Rate (RER) appreciation, de-industrialisation, and de-agriculturalisation. Looney (1990) confirms the presence of the Dutch Disease across several economic sectors in Saudi Arabia. Fardmanesh (1991) claims that rising oil prices will inevitably lead to the de-agriculturalisation of oil-exporting countries. Rodriguez (2006) investigates the presence of Dutch Disease in the Saudi Arabian economy and concludes that despite the observable symptoms, the economy does not experience its detrimental effects. Ismail (2010) highlights that a sustained rise in oil prices leads to de-industrialisation in oil-exporting nations, consistent with Dutch Disease theory. Saab and Ayoub (2010) argue that Dutch Disease in Lebanon, Jordan, and Egypt mostly results from the inflow of foreign capital and remittances, which diminishes international competitiveness and productivity and hence hinders economic growth. Gasmi and Laourari (2017) examine the symptoms of Dutch Disease in the Algerian economy, concluding that the findings did not confirm its existence. Abdlaziz *et al.* (2018) confirm the existence of Dutch Disease and de-agriculturalisation in 25 oil-producing countries.

Despite the existing body of literature, there remains a gap in comprehensive regional analyses that consider both de-industrialisation and de-agriculturalisation simultaneously. Additionally, few studies have systematically explored Dutch Disease's primary indicators, such as exchange rate appreciation, inflation, and sectoral shifts, across multiple MENA economies. This study seeks to fill these gaps by investigating the presence of Dutch Disease symptoms in both oil-rich and oil-poor MENA countries, with a focus on the long-term relationship between oil rents and remittances and Real Effective Exchange Rate (REER), and the value-added shares of key economic sectors.

This study aims to provide a deeper understanding of Dutch Disease in the MENA region by examining both oil-rich and oil-poor economies. The primary objective of this study is to investigate the long-term impact of foreign capital inflows, specifically oil rents and remittances, on the REER and sectoral value-added shares in the manufacturing, agriculture, and services sectors across selected MENA countries to capture de-industrialisation, de-agriculturalisation, and the possible disproportionate growth of the services sector in the regions' oil-rich and oil-poor countries simultaneously. Furthermore, by integrating control variables like Terms of Trade (TOT), Real Interest Rate (RIR), and Trade Openness (TOP), this study accounts for other external influences that might impact REER and sectoral shifts, thus enhancing the accuracy and depth of the analysis. The Autoregressive Distributed Lag (ARDL) model is employed to explore these relationships, as it is particularly allowing to test for the existence of a long-term relationship between the variables and to estimate the long-run dynamics of the relationship (Pesaran *et al.*, 2001).

This study is organised into four chapters. Chapter One introduces the theoretical framework of Dutch Disease, detailing its key models, mechanisms, and effects on resource-dependent economies. Chapter Two focuses on the main indicators of Dutch Disease within the MENA region, such as exchange rate changes, sectoral shifts, and the extent of oil dependency. Chapter Three presents a thorough literature review, highlighting the diverse approaches and findings of past research on Dutch Disease. Finally, Chapter Four covers the data, research methodology, empirical results, and a discussion of the findings, providing insights into the study's outcomes.

CHAPTER ONE

1. THEORETICAL FRAMEWORK

The first part of this chapter identifies the concept of Dutch Disease, while the second part explores its evolution over time and examines the use of Dutch Disease models to assess the negative impact of international trade on economic growth. Additionally, it delves into the key mechanisms that drive Dutch disease, providing illustrative examples through various models.

1.1. The Concept of Dutch Disease

The concept of "Dutch Disease" was first introduced in the 1970s amid growing concerns about the challenges the UK and Norway might face following the discovery of oil fields in the North Sea. The Dutch Disease specifically refers to the economic difficulties experienced by the Dutch economy due to the exploitation of the Slochteren natural gas reserves in Groningen during the 1960s (Hutchison, 1994: 311). The term was first popularised by The Economist, the English journal, in a 1977 article, which sought to explain the unusual economic phenomenon that emerged in the Netherlands after the first oil shock in 1973. The article also anticipated similar symptoms in Britain, which became known as the "British Disease" (The Economist, 1977: 82).

Alongside the term "Dutch Disease," which described the situation in the Netherlands, another model called the "Booming Sectoral Models" has emerged to explain similar economic disruptions in Australia. In his seminal work, Gregory (1976) highlighted significant structural changes within the Australian economy, primarily driven by the rapid expansion of the mining sector. This boom led to a relative decline in the manufacturing and rural sectors as resources were diverted to the burgeoning mining industry. Gregory (1976) demonstrated that the impact of a mining boom on traditional agricultural exports was akin to doubling tariffs, while the effect on the manufacturing import-competing sector was comparable to eliminating all tariffs, thereby increasing import incentives. Essentially, the boom in mineral exports had the same impact on both sectors as a 25% general reduction in tariffs, illustrating how sectoral booms can create imbalances in the broader economy.

In a striking conclusion, reached by "The Economist" in 1977, the discovery of natural resources can paradoxically lead to economic decline. This phenomenon, observed in cases like the Netherlands and Australia, whether analysed through the lens of "Dutch Disease" or "Booming

Sector Models" consistently results in a downturn in the productive sectors of the economy and creates imbalances. In essence, heavy reliance on natural resources can undermine long-term economic growth and development by weakening sectors like manufacturing and agriculture, which are crucial for sustained and diversified economic progress.

The sharp rise in oil prices during 1979–1980 renewed interest in Dutch Disease models, leading to the development of various frameworks to better understand the economic challenges faced by certain developing countries benefiting from oil price booms. These models highlighted how positive external shocks, such as rising oil revenues, can create imbalances within an economy, but the models also contributed to some confusion about the concept of Dutch Disease, since during the discussions about oil-producing nations, often use the term inconsistently, applying it to different and sometimes contradictory processes.

While Dutch Disease is most commonly associated with oil extraction and booming resource sectors, its effects are not exclusive to these industries. The broader implications of Dutch Disease extend beyond natural resources, since any substantial and sustained inflow of foreign capital, whether through aid, remittances, or investment, can have similar effects by distorting the balance of economic activity. This can result in over-reliance on the booming sector, increased vulnerability to external shocks, and a long-term erosion of the non-booming sectors. Thus, the term extends beyond resource-rich nations to encompass a variety of scenarios where rapid, unbalanced growth in one area undermines the overall stability of the economy (Corden, 1984: 360).

Considering the various potential sources of shocks, Dutch Disease becomes a more intricate model, applicable to a wide range of economic scenarios. The key driver behind these distortions is the shift in relative prices, particularly the appreciation of the RER, which makes exports of the tradeable sectors less competitive in the global market. Moreover, the reallocation of resources, both labour and capital, towards the booming sector comes at the expense of traditional industries, leading to long-term structural imbalances in the economy. These dynamics explain why countries experiencing a resource boom often struggle to maintain balanced growth, as the over-reliance on a single sector can make them more vulnerable to external shocks and fluctuations in commodity prices.

1.2. Dutch Disease and Resource-Based International Trade Models

1.2.1. The Dependency Theory

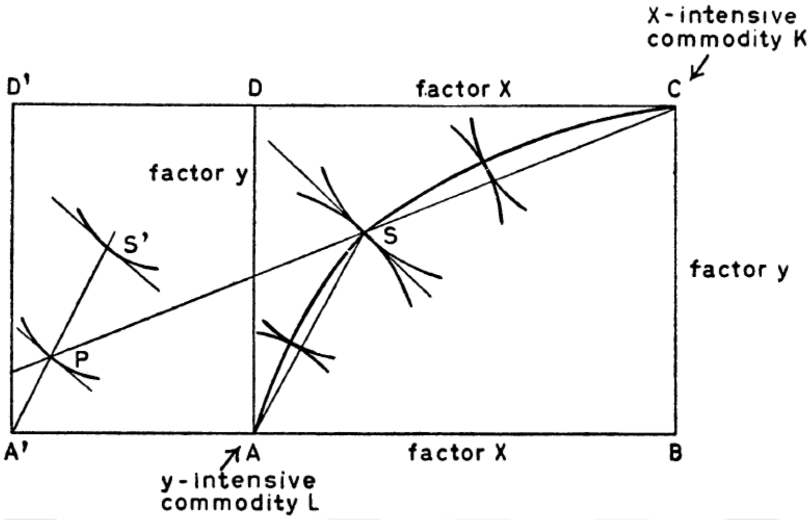
The dependency theory emerged as one of the earliest analytical frameworks that sought to explain the development challenges encountered by countries reliant on primary product exports in the context of international trade. This theory gained prominence in the late 1960s and 1970s through scholars such as Celso Furtado, Anibal Pinto, and Paul A. Baran, who were deeply involved in underdevelopment research. The roots of this theory trace back to two influential publications from 1949 by Hans Singer and Raúl Prebisch, in which in these works, they observed a concerning trend: The terms of trade for underdeveloped countries were deteriorating relative to developed nations, which meant that countries exporting raw materials received fewer manufactured goods in return, a pattern later termed the “Prebisch-Singer Thesis” (Toye & Toye, 2003).

According to proponents of dependency theory, international trade, controlled by developed “core” or “dominant” countries, reinforces the global division of labour, exacerbates international inequalities, and fosters dependency among “periphery” or “dependent” countries. This unequal dynamic is driven by the core countries’ superior market power and price-setting ability, which ensures that wealth continues to accumulate in developed nations, even when generated by the labour and resources of developing countries. Furthermore, supporters of this theory argue that even when commodity prices rise temporarily, the increased export earnings do not lead to long-term diversification or development in the economies of “Third World” countries. This failure to spread the benefits from export sectors to the rest of the economy is attributed to rigid economic, social, and cultural structures of these countries. Within this framework, industries like petroleum are viewed as isolated sectors, with their limited economic integration occurring primarily through state budgets (Ahiakpor, 1985: 536).

1.2.2. The Rybczynski Theorem

The Rybczynski theorem falls within the framework of neoclassical theories that have aimed to explain the determinants of international trade patterns. Within this analytical framework, the theorem illustrates the composition of international trade through the term of “relative abundance of a factor of production,” in which forms the basis of comparative advantage. The theorem, principally represents an extension of the Heckscher-Ohlin model, and posits that, under constant terms of trade, an increase in the supply of one production factor will lead to a disproportionate rise in the output of the sector that uses that factor intensively, while the output of the sector that uses it less intensively will decline. This asymmetrical adjustment reflects the reallocation of resources, emphasising how variations in factor abundance can drive shifts in a country’s trade and production dynamics.

Figure 1: Illustration of the Rybczynski Theorem



Source: Rybczynski, 1955

Figure 1 describes the theorem in the case where a country exhibits labour abundance and capital scarcity, leading it to specialise in the production of two commodities; K (clothes) and L (computers). In this context, AD represents the Y (capital) endowment, and AB represents the X (labour) endowment. The iso-product curve for K, which is X-intensive, originates from point C, while the iso-product curve for L, which is Y-intensive, originates from point A. The non-linear curve of contracts denoted as ASC, represents the possible trade-offs between the two goods. At equilibrium before any changes, denoted as point S, as the country produces CS amount of K, while producing an AS number of L.

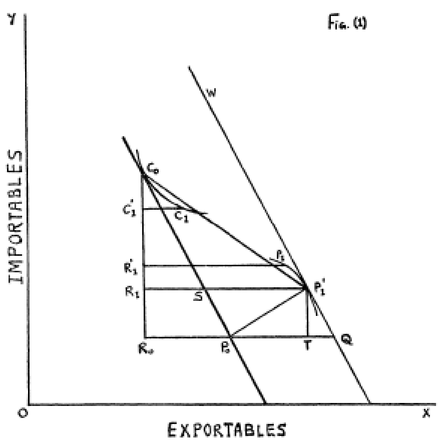
When the supply of X (labour) increases, resulting in a new labour endowment of A'B, and assuming the capital stock remains constant, the new production possibilities frontier is now A'BCD'. At the new equilibrium point P, after the change in endowments, the country produces CP units of the X-intensive commodity (K), and A'P units of the Y-intensive commodity (L). This shift implies that the production of the Y-intensive commodity must decrease at point P compared to point S, while the production of the X-intensive commodity expands. This demonstrates that if the factor intensity remains constant in both commodities, there will be no change in the prices of the two factors. If commodity prices remain stable, it implies that the prices of goods will also remain unchanged. Therefore, the sole impact of the increased supply of X is an increase in output. Specifically, the output of K increases from CS to CP, reflecting the boost in the production of X-intensive goods. However, the output of L decreases from AS to A'P. Consequently, the accumulation of labour results in an increase in the production of labour-intensive goods, such as clothes, while simultaneously reducing the output of capital-intensive goods like computers (Rybczynski, 1955).

The Rybczynski theorem suggests that the growth of a natural resource, such as oil, can have negative consequences for the development of other industries, particularly manufacturing. In this regard, the theorem shares similarities with the Dutch Disease model, though the underlying mechanisms differ. The Rybczynski theorem attributes de-industrialisation primarily to the “Resource Reallocation” effect, where increased resources in one sector (like oil) lead to a reduction in other sectors. In contrast, the Dutch Disease model explains the decline in manufacturing through two main channels: The “Resource Movement” effect, which shifts labour and capital to the booming resource sector, and the “Spending Effect,” where higher income from resource exports leads to increased demand for non-tradeable goods and an appreciation of the RER. The combination of these effects results in reduced competitiveness and output in the tradeable manufacturing sector. Both theories, while different in their specifics, highlight how resource booms can undermine long-term industrial development.

1.2.3. The Theory of Immiserising Growth

The theory of Immiserising Growth, introduced by economist Jagdish N. Bhagwati in 1958, explores how economic growth can paradoxically harm a country’s welfare in the context of international trade. This neoclassical theory rests on a simple premise: When a country expands its production capacity for certain export goods, it may flood global markets, leading to a decline in their prices. If the resulting deterioration in the country’s terms of trade (the ratio of export prices to import prices), outweighs the benefits of increased production, the country’s real income can actually fall. In essence, even though the country produces more, the value of its exports declines so much that it experiences a net loss in overall welfare. This concept challenges the traditional view that growth is always beneficial, particularly for countries heavily reliant on a narrow range of export commodities.

Figure 2: Theory of Immiserising Growth: Hypothesis of a Deterioration in the Terms of Trade



Source: Bhagwati, 1958

The Figure 2 demonstrates the Immiserising Growth concept in a case of a country that produces cacao and automobiles and is open to international trade, with a comparative advantage in cacao production. At the initial time t_0, point P_0 represents the country's production point, and C_0 denotes its consumption level, which is based on the international exchange rate between cacao and automobiles. The slope P_0C_0 represents the country's terms of trade before expansion. In this case, R_0P_0 is the amount of cacao exported from the country, while C_0R_0 represents the number of imported automobiles to the country.

When the country experiences growth in the cacao sector, its production possibilities curve shifts outward, enabling it to produce more cacao. If the terms of trade remain constant, the production point shifts to P'1 and the country's consumption level moves to C_1, when the terms of trade changes sufficiently to offset indifference and the new production possibility curve, to a minor change from C_1P_1 to $C_0P'_1$, which means that $C'_1R'_1$ is the new amount of the imported automobiles to the country. The expansion of cacao production results in a loss of consumption (as C_1 lies on an indifference curve lower than the one passing through C_0), leading to a decline in well-being, exemplifies the concept of Immiserising Growth, where growth results in a loss of welfare instead of improvement (Bhagwati, 1958: 202).

Bhagwati's theory of Immiserising Growth and the Dutch Disease theory share common ground in illustrating the paradox where economic expansion can lead to negative consequences for a country's welfare. Both highlight how the development of new resources or sectors may result in unforeseen impoverishment, yet they differ in how this manifest and its broader economic implications.

The Immiserising Growth primarily addresses the decline in social welfare, which stems from a deterioration in terms of trade. Here, the country's growth in export capacity leads to a fall in global prices for those exports, which diminishes the nation's real income despite increased production. The impoverishment is seen as a reduction in overall well-being without necessarily affecting the structure of the economy or the production of different goods. In contrast, Dutch Disease primarily focusses on sectoral imbalances. It examines how a boom in one sector, typically natural resources, leads to a reallocation of resources away from other sectors, particularly manufacturing. This results in a decline in the production of non-resource tradeable goods, making the country overly reliant on its natural resources. The "impoverishment" in Dutch Disease comes from a hollowing out of the economy, where the non-booming sectors shrink and economic vulnerability increases due to overdependence on volatile resource markets. Additionally, Bhagwati's theory does not directly address the sectoral distortions emphasised in Dutch Disease. While Immiserising Growth focusses on terms of trade and overall welfare, Dutch Disease highlights how an unbalanced resource-driven growth can lead to long-term structural problems in the economy. Thus, while both theories acknowledge the risks of resource-based growth, they address different aspects of the economic repercussions.

1.3. Dutch Disease Models

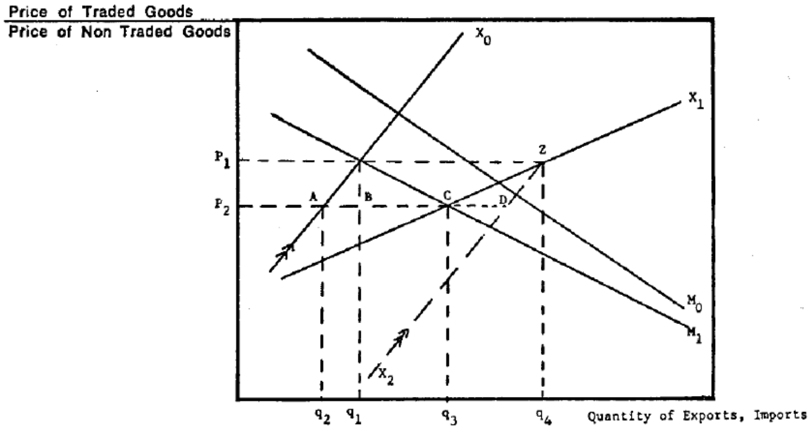
1.3.1. Gregory's Model (1976)

In 1976, Gregory introduced a model that analysed how natural resource development could adversely affect other economic sectors, particularly manufacturing. His work focused on the economic dynamics experienced by Australia during the rapid expansion of its mineral sector. Gregory (1976) proposed that the rise of the natural resource sector would lead to a relative decline in traditional export and import-competing sectors.

Gregory's model (1976) examines the effects of economic growth on the RER and its subsequent impact on the economy as a whole. Specifically, the model analyses how a booming resource sector, such as mining, affects the prices of traded goods (exports and imports) relative to non-traded goods that are domestically consumed (services). This analysis particularly takes Australia as a case study, which Gregory assumes to be a small open economy without any ability to influence global prices. The model's primary argument is that mineral discoveries lead to an increase in export supply, causing a surplus in the balance of payments. This surplus must be corrected either through an appreciation of the domestic currency or through domestic inflation. Both mechanisms raise the prices of non-traded goods relative to traded goods (imports and exports), leading to a reduction in the competitiveness of export industries and import-competing sectors.

In Gregory's model, as depicted in Figure 3, the vertical axis represents the RER, defined as the ratio of traded to non-traded goods prices, and the horizontal axis shows the quantities of exports and imports.

Figure 3: Gregory's Model (1976)



Source: Gregory, 1976

In Figure 3, X_0 represents the export supply of traditional sectors, such as agriculture, before the discovery of the mineral resource. When a new resource sector arises, the total export supply shifts outward, forming a new export curve (X_1), where the distance between X_0 and X_1 represents the quantity of exports attributed to the mineral sector. On the other hand, the import demand curve (M_0) initially remains unchanged. Following the equilibrium constraint (X_0 + X_1 = M_0), which means balancing exports and imports, the surplus generated by the booming export sector needs to be absorbed. This can be achieved either by increasing imports or decreasing exports from sectors other than the booming one. In other words, when there is an oversupply of exports from the booming sector, it is necessary to either import more goods or reduce exports from other sectors to maintain a balanced trade.

The discovery of mineral resources increases the supply of exports. This pushes down the relative price of the non-mining sector's exported goods (agriculture), from P_1 to P_2. Consequently, the traditional export sector contracts, and export quantities fall from q_1 to q_2 (moving from point B to point A). The boom in the mineral sector leads to a crowding-out effect in the agricultural sector. Simultaneously, the price of imported goods declines, causing an increase in import quantities, from q_1 to q_3 (moving from point B to point C). This reflects the expansion of the mining sector, leading to a rise in imports and a shrinkage of the import-competing sector.

Lastly, even the newly booming sector faces challenges, since if the initial investment or output plans were based on the old price ratio P_1, the shift to a new, lower price ratio P_2 creates a misalignment between expectations and actual profitability. The gap between the expected and actual results can be measured by comparing the output at the old and new price ratios. This is exhibited by a parallel line (X_2) to the original line (X_0) through point z and by measuring the horizontal distance between X_2 and X_1 at the new price ratio P2, which is represented by the distance between points C and D.

Furthermore, Gregory (1976) argues that the sudden emergence of a new export sector disrupts profitability expectations across existing sectors due to changes in the price ratios between traded and non-traded goods, making each sector less profitable. If these price ratios remain unchanged, the wealth of the community will not increase, as mineral exports will only accumulate foreign reserves. However, this disruption is temporary, and once the adjustment period ends, each sector returns to its long-term profitability. In the short term, sectors affected by the new export sector may face higher unemployment and financial difficulties, often leading them to request government support, such as devaluing the Australian dollar or seeking sector-specific aid.

1.3.2. Corden Model

Corden and Neary's (1982) model, which is an extension of the Dependent Economy Model presented by Salter (1959), explores Dutch Disease dynamics in a small open economy specialising in two traded goods and a non-traded good. The traded goods sectors consist of energy (X_e), and manufacturing (X_m), while the non-traded sector represents services (X_s). The model assumes perfect wage flexibility, ensuring full employment, and incorporates Hicks-neutral technological improvements. The model focuses on the distribution of gains among sectors rather than on whether economic growth improves welfare. The model also assumes each sector has a specific factor (capital) and a mobile factor (labour) that can redistribute resources based on economic changes.

The model identifies two key effects of a booming energy sector: The Resource Movement Effect and the Spending Effect. The Resource Movement Effect occurs when mobile factors, particularly labour, shift toward the booming sector and the non-traded goods sector, leaving the manufacturing sector with fewer resources. This labour shortage reduces the production of traded goods outside the energy sector. On the other hand, the Spending Effect involves the use of increased income from the energy sector boom. If the surplus in the balance of payments leads to higher overall income, and assuming a positive elasticity of the demand for non-traded goods, this income boost will raise demand for non-traded goods, however, the resulting excess demand causes domestic prices of non-traded goods to rise, leading to an appreciation of the RER. This appreciation increases the production of non-tradeable goods while deteriorating the production of tradeable goods outside the energy sector.

In the study published in 1984, Corden aimed to extend the 1982 model by introducing three distinct sectors in an economy as follows;

- The Booming Sector: This sector pertains to industries such as oil or other primary exports experiencing a phase of increasing prices, significant resource discoveries, or technological advancements that lead to substantial cost reductions.

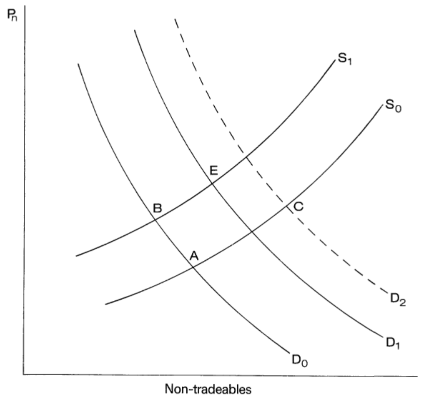
- The Lagging Sector: This sector encompasses other traded goods, including exports and domestically produced substitutes for imports in both the manufacturing and agricultural sectors. It represents industries that may not be experiencing the same level of growth or cost reduction as the booming sector.
- Non-Tradeable Goods: This sector involves services, utilities, transportation, and other goods that are not directly involved in international trade.

Corden’s (1984) analysis begins with a core model that considers the medium term and explores the dynamics among these three sectors. In Corden’s model (1984), factors of production are assumed to be specific to each of the three sectors: The booming sector (B), the lagging sector (L), and the non-tradeable goods sector (N). The only mobile factor is labour, which allows for equal wages across all sectors. The model assumes flexible factor prices and the immobility of factors across borders. Moreover, the model depicts three sectors: B, L, and N. Sectors B and L produce tradeable goods with prices determined on the world market, while sector N produces non-tradeable goods with prices set domestically based on local supply and demand. Each sector’s production relies on labour and another specific factor.

Corden (1984) examines the impact of a boom in sector B on the other sectors. This boom can stem from exogenous technological changes confined to the country, windfall discoveries of natural resources, or an exogenous increase in B’s product price on the world market relative to imports since B exclusively produces for export. As in the previous model (1982), growth in the booming sector has two distinct effects: A Spending Effect and a Resource Movement Effect.

The Spending Effect occurs when a particular sector, such as sector B, experiences a significant economic boom. The Spending Effect materialises when the additional income generated in sector B is utilised, either through direct expenditure by individuals or through government spending. A crucial aspect of this effect is the positive income elasticity of demand for goods in the non-tradeable sector, denoted as N. This positive elasticity causes the prices of these goods to rise relative to those of the tradeable sector, resulting in a real appreciation.

Figure 4: The Impact of the Boom in the Commodity Market



Source: Corden, 1984

The Resource Movement Effect, on the other hand, is twofold. Firstly, the increased marginal product of labour in sector B attracts labour from sector L, reducing its production. This is known as the "direct de-industrialisation effect," since it doesn't involve the non-tradeable goods market or require RER appreciation. Secondly, labour transfers from sector N to sector B at a constant RER. This shift in resource allocation leads to a shift in the supply curve from S_o to S_1 (Figure 4), thus creating excess demand for N, which, in addition to the spending effect, causes further real appreciation. Consequently, more labour moves from sector L to sector N, reinforcing the de-industrialisation process arising from the Spending Effect.

The combination of these effects results in a transfer of labour from sector L to sector N, known as the "indirect de-industrialisation effect", which complements the direct de-industrialisation effect resulting from the labour transfer from L to B. The output in the non-tradeable sector may either rise or fall, depending on the interplay between the Spending Effect and the Resource Effect. In terms of the factors' income distribution, both effects reduce the real income of the specific factor in the lagging sector (L), which constitutes the core issue of Dutch Disease. Additionally, the lagging sector experiences a decrease in production in all cases, while the non-tradeable sector's production can either increase or decrease.

CHAPTER TWO

2. BACKGROUND AND ANALYSIS OF DUTCH DISEASE IN MENA

2.1. Background of MENA

MENA, an acronym for the Middle East and North Africa, which is widely used in fields such as academia, military strategy, media, and business. According to the World Bank (WB)'s 2003 definition, the MENA region includes 21 countries, however, due to significant economic disparities within the region, MENA is often divided into two main groups: The 6 Gulf Cooperation Council (GCC); Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and UAE; and other Arab economies comprising: Algeria, Djibouti, Egypt, Iraq, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia, the West Bank and Gaza, and Yemen. This division also reflects significant differences in income levels across these nations. According to the Conference Board Total Economy Database (TED) (2022), while the median per capita income in 14 MENA countries was slightly above $15,500 (in purchasing power parity) in 2022, in sharp contrast, GCC economies enjoy much higher income levels, with Qatar, for instance, having a median income nearly seven times greater than the regional median. On the other hand, some countries, such as Yemen, have income levels well below the median, making it the poorest country in the region.

In 2003, the World Bank further introduced a classification system for MENA countries based on their resource and labour abundance, dividing them into three subgroups:

1. Resource-rich and labour-rich countries: This subgroup includes four countries that are net exporters of resources and labour: Algeria, Syria, and Yemen, in addition to countries like Iraq and Libya.
2. Resource-rich, labour-importing countries: This subgroup comprises the six GCC countries. This sub-group is a net labour importer and extremely resource-rich.
3. Resource-poor, labour-abundant countries: This category consists of Djibouti, Egypt, Jordan, Lebanon, Morocco, and Tunisia.

These classifications highlight just one aspect of the MENA region's diversity. It is worth noting that population size is another critical factor that differentiates these countries. Within the GCC, while populations vary from 1 to 2 million in some countries like UAE and Qatar, Saudi Arabia standing out with more than 36 million. In contrast, several non-GCC countries in MENA have much larger populations: Egypt has 113 million, Iran 90 million, and both Algeria and Iraq have populations exceeding 45 million as of 2023. These demographic differences significantly impact market size and economic development across the region.

Table 1: Classifications of MENA Countries

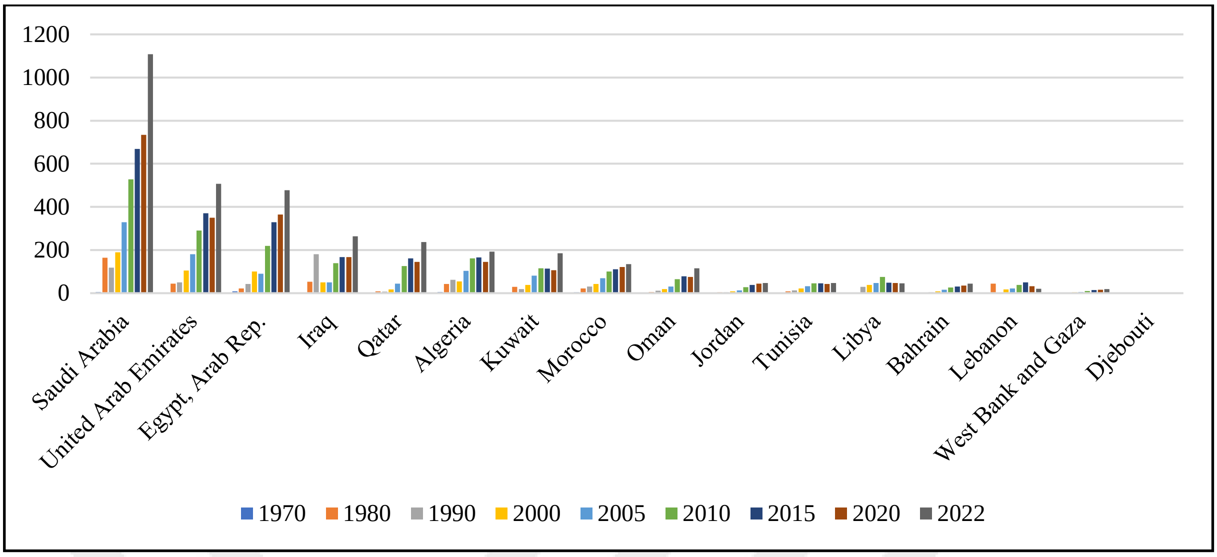
Classification	**Countries**
GCC Countries	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE
Other Arab Countries	Algeria, Djibouti, Egypt, Iraq, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia, the West Bank and Gaza, and Yemen
Resources and Labour Abundance	
Resource-Rich, Labour-Rich Countries	Algeria, Iraq, Libya, Syria, Yemen
Resource-Rich, Labour-Importing Countries	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE
Resource-Poor, Labour-Abundant Countries	Djibouti, Egypt, Jordan, Lebanon, Morocco, Tunisia
Population Size	
Large Population Countries	Algeria, Egypt, Iraq, Morocco, Syria, Saudi Arabia, Yemen
Small Population Countries	Bahrain, Djibouti, Jordan, Kuwait, Lebanon, Libya, Malta, Oman, Qatar, UAE, Tunisia, the West Bank and Gaza
Per Capita Income	
High Per Capita Income	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE
Upper Middle Per Capita Income	Iraq, Jordan, Libya
Lower Middle Per Capita Income	Algeria, Djibouti, Egypt, Iran, Lebanon, Morocco, Tunisia
Low Per Capita Income	Syria, Yemen

Source: Prepared by the Author based on World Bank Database, 2023.

2.1.1.Growth Rates of GDP, Per Capita Income and Labour Productivity in MENA

The MENA region is a significant economic entity with a relatively high standard of living compared to global standards. In 2022, the region’s nominal GDP reached $4.41 trillion, accounting for 4.38% of the world’s GDP and 12% of the total GDP of developing nations. Saudi Arabia is the region’s largest economy, contributing 25% of the total GDP. UAE follows as the second-largest economy, at about half the size of Saudi Arabia. Meanwhile, the five smallest economies; Bahrain, Lebanon, West Bank and Gaza, Djibouti, and Yemen together made up only about 3% of the region’s GDP in 2022 (World Bank Database, 2023).

Figure 5: Evolution of GDPs of the MENA Countries, 1970-2022 (GDP, current US $)



Source: Prepared by the Author based on World Bank Database, 2023

The MENA region is characterised by its diverse group of countries, varying in terms of income levels. This heterogeneity ranges from high-income countries to those classified as middle-income or even low-income. To better understand these income disparities, Table 2 shows the income levels in terms of Purchasing Power Parity (PPP) of the MENA countries from 1950 to 2022.

Notably, the GCC countries have experienced a relatively high level of per capita income, primarily due to their substantial oil revenues. Among the GCC nations, Qatar stands out with the highest per capita income, amounting to $110,022, which surpasses the average income in the United States (US) by 55% in 2022 (US per capita income amounted to $70,849). The UAE and Kuwait also boast average incomes slightly above that of the US, with figures of $73,590 and $72,130, respectively. In comparison, Bahrain and Saudi Arabia, two other GCC members, have income levels ranging between 75% and 80% of the average income in the US. On the other hand, Oman's income level within the GCC is considered the lowest, which amounts to approximately 50% of the average income in the US.

An observable pattern emerges when examining the relative income levels of the economies within the GCC. These income levels have fallen over time, owing in part to their diversification orientation toward non-oil businesses. Qatar, Kuwait, and the UAE have seen their income levels deteriorate since the 1990s, while Oman has had successive rises in relative income levels since 1980, despite the oil's contribution's rapid decline from 55% in the 1980s to 23% by 2022.

Table 2: Income Per Capita in MENA Region Countries in Terms of Purchasing Power Parities (PPP), US$

Countries	1950	1960	1970	1980	1990	2000	2010	2020	2022
GCC Economies									
Qatar	291,153	314,369	312,100	275,671	70,358	85,589	112,539	107,225	110,022
Kuwait	153,875	153,531	163,554	70,713	32,615	62,322	75,619	69,890	72,130
UAE	135,097	191,840	209,966	236,963	119,390	107,437	63,281	69,106	73,590
Bahrain	23,714	32,040	42,683	49,448	46,246	55,655	52,054	52,066	53,542
Saudi Arabia	15,540	25,909	53,109	89,345	45,964	46,629	49,010	49,106	52,317
Oman	2,869	4,303	17,488	18,747	29,829	35,090	38,750	40,477	34,875
Other Arab Economies									
Libya	14,186	30,281	150,848	120,343	51,091	42,320	40,150	5,858	12,045
Lebanon	11,663	11,489	14,006	16,921	9,299	17,773	25,873	16,483	15,455
Egypt	2,459	2,860	4,148	6,114	7,625	9,899	12,992	14,461	15,726
Algeria	-	7,017	7,558	10,591	9,902	9,728	12,098	12,103	12,483
Tunisia	1,970	2,373	3,228	5,202	5,894	8,179	11,213	10,764	11,182
Iraq	4,666	9,358	11,882	21,821	8,412	4,127	10,147	10,756	10,121
Jordan	4,226	5,920	6,087	11,383	9,636	10,400	13,513	10,353	10,534
Morocco	2,383	2,176	2,647	3,721	4,242	4,862	6,958	7,914	8,661
Syria	2,563	3,217	3,767	6,925	6,066	7,375	8,475	4,959	4,928
Yemen	1,923	2,034	2,596	4,834	4,796	5,994	6,766	2,850	2,714
Median	4,666	8,188	12,944	17,834	9,769	14,087	19,693	13,282	13,969
United States	17,858	21,454	28,750	35,234	44,439	55,115	59,884	65,647	70,849

Source: TED, April 2022.

On the other hand, the rest of the MENA region's countries (outside the GCC) are relatively poorer. Lebanon accounts for 25% of the US income level, Egypt for 22%, Algeria and Libya for 17%, Iraq and Jordan are in the range of 14 to 16%, and Syria and Yemen scored the lowest income in the MENA region, with about 5% of the US income level in 2022. Upon examining the numbers, it becomes evident that a common factor among these impoverished countries is their exposure to internal instability and conflicts. These factors often lead to a slowdown in infrastructure investment and weak capital markets, thereby constraining their capacity to increase investment, jobs, and incomes. Importantly, all countries today exhibit lower relative income levels compared to 1950 (TED, 2022).

The discovery of oil in the GCC countries has resulted in a substantial influx of income, leading to significant investments in infrastructure, healthcare, education, and public sector enterprises (Yousef, 2004). These oil-rich economies have experienced a boost in revenue and productivity as a result of that. Simultaneously, other Arab countries outside the GCC have also reaped the benefits of labour exports and remittances during the initial phases of oil production. This has supported domestic consumption and production in their respective economies (Kapiszewski, 2017: 4).

Table 3: Growth Rates of GDP, Per Capita Income and Labour Productivity, 1950-2019

	1951-1960	1961-1970	1971-1982	1983-1992	1993-2009	2010-2019
GDP Growth						
World	4.9	5.4	3.4	2.8	3.3	3.1
Advanced Economies	4.8	5.2	3.0	3.0	2.3	2.0
Emerging & Developing Economies	5.1	5.7	4.1	2.4	4.5	4.2
GCC	7.3	10.4	6.4	1.9	3.4	3.4
Other Arab Economies	4.8	5.6	6.1	2.4	3.9	2.8
Per Capita Income Growth						
World	3.2	3.8	2.1	1.6	2.3	2.3
Advanced Economies	3.5	4.1	2.2	2.3	1.6	1.5
Emerging & Developing Economies	2.7	3.4	1.7	0.6	3.2	3.1
GCC	3.6	5.1	0.1	-2.3	-0.7	1.0
Other Arab Economies	2.3	2.5	2.7	-0.4	1.9	1.1
Labour Productivity Growth						
World	3.4	3.9	1.7	1.3	2.1	2.1
Advanced Economies	3.6	4.0	2.0	2.0	1.5	1.0
Emerging & Developing Economies	2.9	3.6	1.2	0.3	2.8	3.1
GCC	3.5	5.1	1.1	-2.7	-1.3	-0.8
Other Arab Economies	3.0	3.7	1.9	-0.7	0.9	1.0
Other Arab Economies in this calculation include the remaining Arab countries outside the GCC, namely: Algeria, Iraq, Jordan, Lebanon, Morocco, Syria, Tunisia, Yemen, and the West Bank and Gaza						

Source: International Labour Organisation (ILO), 2022.

From 1950 through 1970, the MENA region enjoyed a period of rapid economic growth, evidenced by remarkable gains in GDP, income per capita, and labour productivity. It is worth mentioning that the economies of the GCC countries played the most important role in fuelling this boom, with growth rates in this region surpassing global growth rates at the time. The region's phenomenal prosperity induced Girgis (1973) in his seminal work to highlight the impressive expansion of the Arab world economy between 1958 and 1967, where the study emphasised that the growth rate during this period outpaced that of developed economies during the Industrial Revolution in the UK (2%, 1790–1820), Germany (2.7%, 1850–1880), the US (4%, 1820–1850), and Japan (4%, 1876–1900).

The dominant influence of oil rents on macroeconomic performance becomes evident when examining Table 3. While the GCC countries experienced high GDP growth and per capita income throughout the 1960s and early 1970s, advanced and emerging economies faced slower growth in both indicators. However, this period of rapid growth in the MENA countries soon began to decline in subsequent years, especially in the late 1970s and the 1980s. This was mainly due to rapid population growth and a sharp decline in oil prices. During the first two periods, labour productivity growth either matched or slightly exceeded the increase in per capita income across all regions. However, this pattern changed between 1971 and 1982. Although productivity growth continued to surpass per capita income growth in the GCC and Arab economies, global productivity growth slowed down and fell below per capita income growth. In the most recent period, from 2010 to 2019, the MENA economies faced challenges with income and productivity, with minimal GDP growth and declining productivity. It is important to note that the high volatility in growth is mainly due to the geopolitical situation and internal instability in many Arab countries.

Since the 1980s, productivity has remained a challenge for the economies of the Arab world as a whole, particularly in the GCC. The disparity between productivity growth and per capita income growth could mean that jobs in the region become increasingly less productive.

2.1.2. The Impact of COVID-19 on the MENA Region

The COVID-19 pandemic profoundly disrupted global economic activity, with the MENA region among those severely affected. Pandemic-induced lockdowns, trade disruptions, and health crises in 2020 led to a sharp contraction in economic output, with many countries experiencing negative growth rates. The region's GDP plummeted due to significant disruptions in key industries like tourism, oil production, and trade. Although the GCC and other Arab economies showed signs of recovery in 2021, this rebound lagged behind that of other emerging markets, reflecting the region's unique vulnerabilities.

Several factors, particularly in 2021 and beyond, contributed to the slow recovery. One of the most striking events was the historic crash in oil prices in April 2020, when the US West Texas Intermediate (WTI) crude oil prices dropped below zero for the first time in history. A drastic drop in demand led to an unprecedented situation where the cost of storing excess oil surpassed its market value, leaving producers struggling to sell their output (US Energy Information Administration, 2021). For oil-dependent MENA economies, this event dealt a severe blow, exposing their vulnerability to global market fluctuations, and highlighting the pressing need for economic diversification, as many of these countries rely heavily on oil exports for revenue.

In addition, COVID-19 exposed long-standing structural weaknesses in the MENA economies, including high dependency on public sector employment and underdeveloped private sectors. The already sluggish productivity growth, which had been declining even before the pandemic in 2019 and persisted throughout 2020, 2021, and 2022, compounded these issues. The pandemic also highlighted significant social and economic inequalities within the region. Informal workers and those in lower-wage jobs were disproportionately affected by job losses and income instability, further widening income disparities. Furthermore, in many MENA countries, government fiscal constraints hindered their ability to implement robust economic stimulus packages, leaving households and businesses more vulnerable to the crisis. Additionally, the disruption to global supply chains and reduced Foreign Direct Investment (FDI) had a lasting impact on both job creation and long-term economic development. This was particularly detrimental to sectors like construction and manufacturing, which rely on both international demand and migrant labour. The volatility in oil prices continues to pose a long-term challenge, as many MENA countries depend on oil revenues to finance public spending and job creation programs (World Bank Database, 2022).

Table 4: Growth Trends in MENA During and After COVID-19

Countries	2019	2020	2021	2022
GDP Growth				
Other Arab Economies	1.3	-6.5	3.9	3
GCC	0.7	-4.8	1.9	4.4
Emerging Markets	2.8	-2.7	5.1	4.7
Per Capita Income Growth				
Other Arab Economies	0.01	-7.7	2.8	1
GCC	-1.2	-6.6	1.1	3.1
Emerging Markets	1.9	-3.5	4.3	2.8
Labour Productivity Growth				
Other Arab Economies	-0.6	-3.1	1.7	-1
GCC	-3.1	-5.3	-0.5	1
Emerging Markets	2.0	0.4	2.3	2.3

Source: ILO, 2022

The MENA region faced four major crises in the past decade: The violent Arab Spring in the early 2010s, the 2014–2016 oil price shocks, the Arab Spring 2.0 or Second Arab Spring protests from 2018 to 2022, and the COVID-19 pandemic. The COVID-19 crisis, however, differed from the others in terms of its universal impacts and distributional outcomes. The pandemic brought to light the fragility and massive inequality within the region's countries regarding health, economic, and social systems, worsening the existing challenges of poverty, unemployment, informality, and conflict.

Table 4 shows as economies reopened after the COVID-19 lockdown, GDP growth rates, per capita income growth, and labour productivity growth surged in 2021 in all regions. The GCC achieved a GDP growth of 1.9% in 2021 and 4.4% in 2022, compared to a decline of 4.8% in 2020. The GCC also saw an outstanding improvement in other economic indicators, especially per capita income growth. The rest of Arab countries, on the other hand, witnessed a decline in per capita income growth and labour productivity in 2022. A stagnation is recorded in the emerging markets concerning the labour productivity growth, while there is a slowdown in the GDP growth in 2022. Several reasons are attributed to this situation, such as the relatively slow opening after the lockdown, the supply chain disruption, high inflation, and the ongoing Russian-Ukrainian war.

2.1.3. MENA Countries and the Resource Curse

Economists have long debated the paradoxical impact of natural resource abundance, often referring to it as a "curse" rather than a blessing, particularly in countries endowed with large oil reserves. The primary mechanism behind this effect is that resource wealth drives up the value of a country's currency, making exports of traditional industries such as manufacturing and agriculture less competitive. This leads to an over-reliance on the resource sector, hindering diversification and development in other economic sectors. The consequences of this resource curse extend beyond economic structures, affecting public policies and governance. Resource-rich governments often rely heavily on the income from oil or gas exports to fund public services, infrastructure projects, and, most problematically, large subsidies on food, fuel, and other essential goods. While these measures can bring short-term relief, they create a dependency that turns the economy into a welfare state. In such economies, political stability becomes intertwined with the government's ability to maintain these subsidies, which is directly linked to volatile oil prices.

In the MENA region, this economic bubble has persisted for at least six decades, where oil wealth has distorted economic incentives. Oil-exporting countries, especially those in the Gulf region, have enjoyed substantial revenue inflows, but even non-oil-rich countries like Egypt, Lebanon, Morocco, and Tunisia have felt the adverse effects of the oil curse. These nations benefit indirectly through cheap oil imports, foreign aid, and remittances sent home by migrant workers in oil-rich countries. These external flows reduce the pressure on governments to reform, resulting in a sustained dependence on subsidies and foreign support rather than fostering domestic industrial growth. Moreover, the oil curse often leads to what is called the "rentier state" syndrome, where governments rely on resource rents (income from oil or other resources) rather than taxation, weakening the link between the state and its citizens. This disconnect reduces accountability and fosters corruption, as governments do not rely on tax revenues and are thus less incentivised to create inclusive institutions that promote broad-based economic development. Additionally, political elites in resource-rich countries often have a vested interest in maintaining the status quo, further stifling reforms needed to diversify the economy and encourage sustainable growth (Thornton *et al.,* 2008).

As oil prices fluctuate in global markets, the fragility of economies dependent on oil becomes more apparent, leading to fiscal crises during periods of low oil prices. The 2014 and 2020 oil price crashes, exacerbated by the COVID-19 pandemic, exposed these vulnerabilities. For the MENA region, these events underscored the urgent need to diversify away from oil dependency and invest in human capital, technological innovation, and green energy, which are crucial for long-term stability and growth. However, entrenched political interests and the short-term benefits of oil wealth continue to hamper these efforts.

Table 5: Per Capita Income in MENA Countries Relative to US Per Capita Income (%)

Countries	1950	1960	1970	1980	1990	2000	2010	2020	2022
GCC Economies									
Qatar	1630	1465.3	1085.6	782.4	158.3	155.3	187.9	165.5	155.3
Kuwait	861.7	715.6	568.9	200.7	73.4	113.1	126.3	107.5	101.8
UAE	756.5	894.2	730.3	672.5	268.7	194.9	105.7	104.1	103.9
Bahrain	132.8	149.3	148.5	140.3	104.1	101.0	86.9	78.9	75.6
Saudi Arabia	87.0	120.8	184.7	253.6	103.4	84.6	81.8	75.0	73.8
Oman	16.1	20.1	60.8	53.2	67.1	63.7	64.7	59.6	57.5
Other Arab Economies									
Algeria	25.7	32.7	26.3	30.1	22.3	17.7	20.2	18.4	17.6
Egypt	13.8	13.3	14.4	17.4	17.2	18.0	21.7	22.0	22.2
Iraq	26.1	43.6	41.3	61.9	18.9	7.5	16.9	16.5	14.3
Jordan	23.7	27.6	21.2	32.3	21.7	18.9	22.6	15.8	14.9
Lebanon	64.1	52.5	47.8	47.1	20.5	31.6	43.2	25.2	21.8
Morocco	13.3	10.1	9.2	10.6	9.5	8.8	11.6	12.1	12.2
West Bank & Gaza	-	-	6.8	9.5	7.7	9.0	9.9	9.1	5.3
Syria	12.2	12.7	11.1	16.7	11.6	11.4	12.0	5.7	7.0
Tunisia	11.0	11.1	11.2	14.8	13.3	14.8	18.7	16.4	15.8
Yemen	10.8	9.5	9.0	13.7	10.8	10.9	11.3	4.6	3.8
Median	**64.1**	**52.5**	**54.3**	**57.6**	**44.4**	**47.6**	**54.0**	**42.4**	**16.7**

Source: ILO, 2022

As demonstrated in Table 5, with the exception of Oman, all GCC economies have experienced declining incomes, aligning with their efforts to diversify away from the oil sector. Qatar has experienced a notable decline in relative income levels and the proportion of oil in GDP. Qatar's relative income dramatically decreased from 1630.4% in 1950 to 155% in 2022. Similarly, Kuwait and the UAE have also faced declining revenues over recent years. Saudi Arabia's relative income saw a steady increase until 1980, but the gap with the US narrowed sharply in the 1990s. This decline continues today, with relative income levels falling below those of the 1950s. Additionally, the share of oil in Saudi Arabia's GDP, the largest economy in the region, has dropped significantly from three-quarters in the 1980s to one-quarter in 2020. Contrastingly, Oman is the only country in the region that has shown improvement over the years. The rise in Oman's relative income coincided with a significant decrease in oil dependence, signifying progress in economic diversification.

Beyond the GCC, Algeria, one of the top 10 largest oil exporters globally and the third-largest oil producer in Africa, heavily relies on oil export earnings to sustain its economy. Oil exports account for nearly 98% of Algeria's total exports, over 60% of the government's total revenues, and 19% of its GDP. This heavy dependence on oil makes the Algerian economy highly susceptible to fluctuations in global oil prices, leading to significant volatility (World Bank Database, 2020).

In addition to the economic implications, this heavy reliance on oil revenues poses governance challenges. Countries rich in natural resources often face higher levels of corruption and weaker institutions. Wealth generated from oil can be used to maintain power rather than promote development, resulting in a lack of investment in crucial areas such as education, healthcare, and infrastructure. Moreover, the volatility of global oil prices presents a persistent threat to economic stability. Fluctuations in oil prices can cause economic disruptions, making it challenging for governments to plan and implement sustainable development strategies. This dependency also leaves these economies vulnerable to external shocks, including geopolitical tensions and shifts in global demand (Selim & Zaki, 2014).

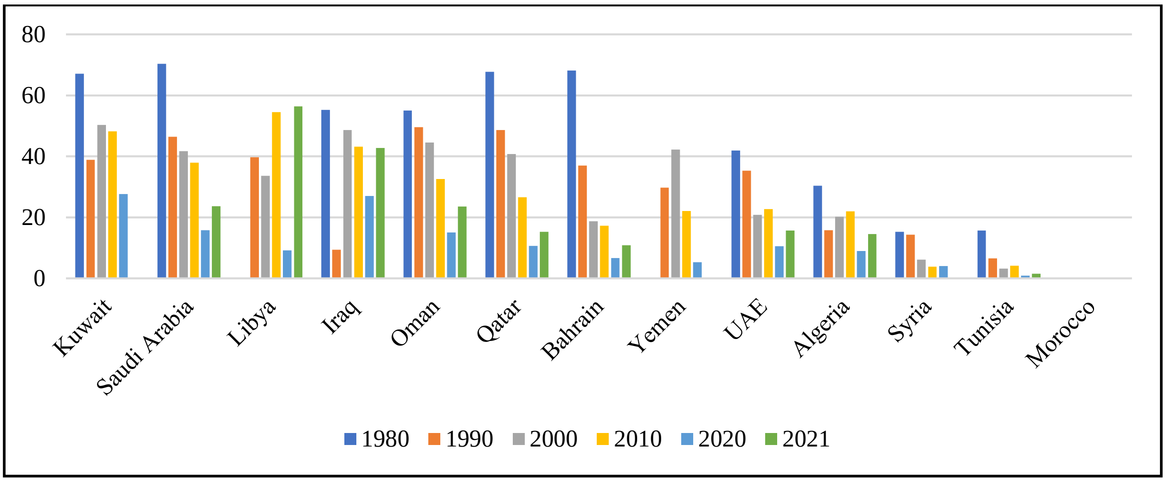
Table 6: Oil Share in GDP in MENA Countries 1980-2022

Countries	1980	1990	2000	2010	2020	2021
Qatar	67.7	48.6	40.8	26.6	10.6	15.3
Kuwait	67.1	38.9	50.3	48.2	27.6	n.a
UAE	41.9	35.3	20.8	22.7	10.5	15.7
Bahrain	68.1	37	18.7	17.3	6.7	10.9
Saudi Arabia	70.3	46.4	41.7	37.9	15.8	23.7
Libya	n.a	39.7	33.6	54.5	9.2	56.4
Algeria	30.4	15.8	20.2	22	9	14.5
Oman	55	49.6	44.5	32.6	15	23.5
Iraq	55.2	9.4	48.6	43.2	27	42.8
Syria	15.3	14.3	6.1	3.8	4	n.a
Tunisia	15.7	6.5	3.2	4.1	0.9	1.5
Yemen	n.a	29.7	42.2	22.1	5.3	n.a
Morocco	0.01	0.008	0.006	0.005	0	0.001

Source: World Bank Database, 2023

In the 1990s, the MENA countries set themselves some new policies in order to achieve three key goals: The transition from a public sector-led economy to a private-sector-led economy; the transition from a closed to a globally integrated economy; as well as achieving what can be considered the ultimate goal: The transition from an oil-dominated economy to a diversified economy. As a result, the economic performance of the MENA region has made some progress since the late 2000s, with higher growth rates, lower volatility, and a higher export market share, despite the harsh competition from fast-growing countries like China and India. However, except for Oman, MENA countries have failed to preserve these gains and could not climb the economic ladder and remain in the lower or upper-middle-income groups. A direct reason for these unsatisfactory results is mainly due to the failure of MENA countries to maintain their undervalued RERs for a longer period of time. Such an undervaluation showed its essential role elsewhere in compensating for market failures and the weak institutional environment that hit the non-resource-intensive trading sector (Diop *et al.*, 2012: 2).

Figure 6: Oil Rents (% of GDP) in MENA Countries, 1980-2021



Source: Prepared by the Author based on World Bank Database, 2023

The oil revenue trends outlined in Figure 6 provide a significant understanding of the economic dependence on oil across the MENA countries between 1980 and 2021. The variation in oil's share of GDP among these countries reflects differences in oil reserves, production capacity, and economic structures. For countries like Libya, Iraq, and Saudi Arabia, which are heavily reliant on oil exports, oil revenues account for a substantial portion of their GDP, ranging from 23% to 56%. This high dependency aligns with lower levels of economic diversification, where oil serves as the primary driver for fiscal and external revenues. Conversely, countries like Syria, Tunisia, and Morocco exhibit a much lower share of oil in their GDP, as their economies are more diversified and they rely more on oil imports than production. This disparity in oil's role highlights the economic differences within the region.

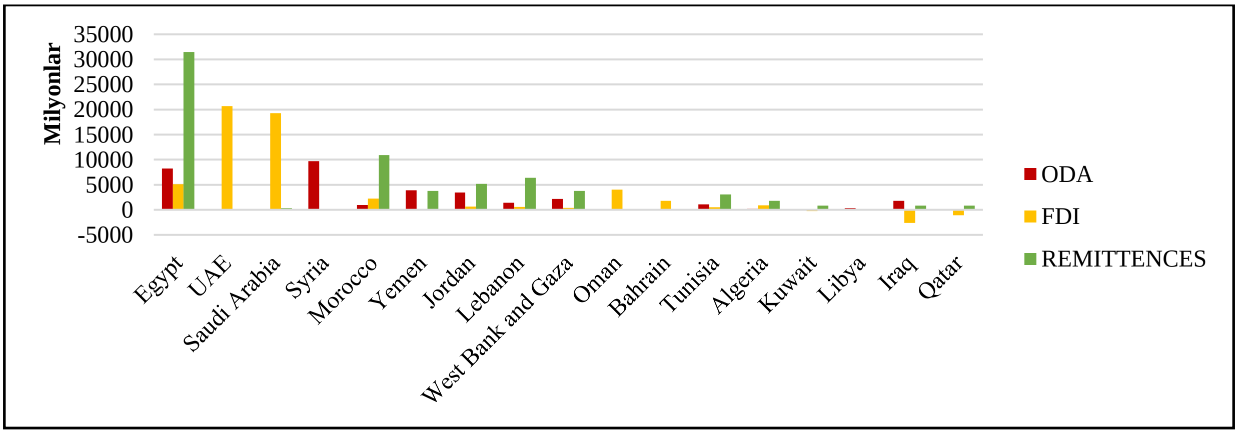
The oil share of GDP fluctuates over time, depending on the changes in oil prices, production, supply, and demand (Obstfeld *et al.,* 2016). For example, the oil share of GDP increased sharply for most countries in the early 1980s; this coincides with the period when prices reached a record high of $35 per barrel in 1980 (equivalent to $140 per barrel in 2022 dollars when adjusted for inflation) (Tobey, 2022). Conversely, the oil share of GDP declined significantly for most countries in the late 2010s and early 2020s, when oil prices dropped to below $30 per barrel, which is commonly referred to as the "2010s oil glut" in academic literature. The oil glut was mostly a result of a substantial oversupply of crude oil that originated in 2014–2015 and intensified in 2016. The Daily Telegraph in 2015 reported that "The world is floating in oil. The numbers we are facing now are dreadful" (Pritchard, 2015).

2.1.4. MENA Countries and Other Sources of the Dutch Disease

Studies generally associate Dutch Disease with heavy dependence on natural resources, mainly due to the original work of Gregory's Model (1976) and Corden and Neary (1982), constituting seminal and central models within the Dutch Disease theory. Their framework established a nexus between booms and windfalls in the natural resource sector and the phenomenon identified as the natural resource curse, colloquially termed Dutch Disease. However, Looney (1990) expanded the discussion by arguing that natural resources are not the only factor contributing to this economic issue, emphasising the importance of taking a broader perspective into account.

Looney's empirical analysis of nations contending with Dutch Disease brings forth the assertion that oil wealth is not the singular catalyst for this adverse economic condition, as there are countries like Japan and Switzerland that experienced instances of Dutch Disease notwithstanding a lack of substantial natural resource reserves. Japan's encounter with Dutch Disease materialised during the technological boom of the 1960s, resulting in economic deterioration across diverse sectors, including agriculture. Meanwhile, Switzerland witnessed a diminishing export competitiveness due to the real appreciation of the Swiss franc, caused by a significant increase in the export of Swiss bonds. This scenario contributed to the manifestation of Dutch Disease in the absence of significant oil wealth.

Figure 7: Foreign Capital Inflows into MENA Countries (ODA, FDI, and Remittances) 2021, million USD



Source: Prepared by the Author based on World Bank Database, 2023

Understanding the economic dynamics and the heterogeneity of the economic structure of the MENA countries is vital for understanding and forecasting the different causes of the Dutch Disease, a phenomenon often associated with resource-dependent economies. While the net oil-exporter countries in the region mainly suffer from over-reliance on oil, leading to the resource curse and thus the Dutch Disease, oil-poor countries might suffer from the Dutch Disease due to various other variables. The significance of studying the impact of foreign capital inflows within the region, particularly in countries like Egypt, Morocco, Tunisia, and Lebanon, cannot be overstated. Despite having the lowest oil share in GDP among MENA countries; Egypt at 3%, Tunisia at 1.5%, and Morocco and Lebanon at 0% in 2021, these economies are significant recipients of FDI, Official Development Assistance (ODA), and remittances, as illustrated in Figure 7. This necessitates a thorough examination of the potential Dutch Disease effects arising from these diverse external funding sources.

- **How Morocco, and Tunisia Can Suffer from Dutch Disease?**

Despite the uncertainty of the adverse effects of ODA, FDI, and remittances inflows, certain indicators have led scholars to look at these elements with suspicion, especially in terms of the RER appreciation that might undermine the production of the exportable goods and the import substitutes. The Spending Effect illustrates the impact of rising disposable income following a surge in foreign capital inflows. Assuming a positive income elasticity, this increase in disposable income leads to higher spending and greater demand for both tradeable and non-tradeable goods. The heightened demand can push prices up, as the country's resources may be insufficient to meet this demand, and the boom does not expand these particular resources. These countries' heavy reliance on non-tradeable sectors, such as tourism, real estate, and remittances, for their growth strategies makes them highly vulnerable to external factors, which are inherently beyond their control. Furthermore, the non-tradeable sectors are usually less productive compared to the tradeable ones, as economies of scale are limited by small markets (Saab & Ayoub, 2010: 348). The negative impact of these exogenous incomes can be minimised by directing the majority of the additional incomes towards investments instead of using them only for consumption. Investment is the ideal way to increase productivity and limit the impact of capital inflows on prices. Additionally, the use of exchange rates to limit price increases is another strategy through currency devaluation.

2.2. Signs and Symptoms of Dutch Disease in MENA

2.2.1. Symptom 1: Exchange Rate Appreciation

The RER, which is defined as the relative price of tradeable goods (P.T.) to non-tradeable goods (P.N.) (Rodriguez, 2006: 6), plays a crucial role in shaping a country's economic cost structure and overall performance. Changes in the RER can significantly impact international competitiveness and long-term growth, specifically, an appreciation of the RER indicates that the domestic currency becomes more valuable compared to foreign currencies, making domestic products less competitive in global markets. This shift leads to reduced export demand and increased import demand, negatively affecting the trade balance. Additionally, an appreciating RER can trigger Dutch Disease, a phenomenon associated with large foreign exchange inflows from sources like natural resource exports, foreign aid, remittances, or capital inflows.

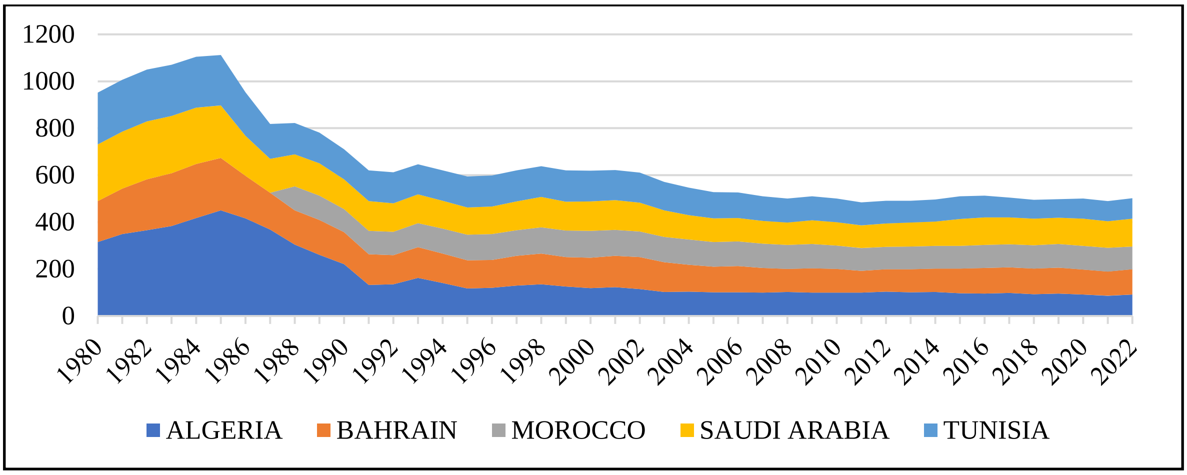
These inflows typically boost domestic income or wealth, driving higher domestic demand for both tradeable and non-tradeable goods, a pattern known as the spending effect. The increased demand for non-tradeable goods tends to raise their relative prices, prompting a reallocation of resources (labour and capital) from the tradeable to the non-tradeable sector, known as the resource movement effect. These dynamics contribute to RER appreciation and cause structural shifts in the economy. Such changes can result in negative outcomes, including de-industrialisation, lower productivity growth, increased reliance on foreign exchange inflows, and reduced resilience to external economic shocks (Magud & Sosa, 2013).

However, RER alone does not fully capture the trade competitiveness impact, as it excludes relative prices and costs of a country's key trading partners. The OECD (2013) suggests that various measures exist for assessing exchange rate price competitiveness, such as the Nominal Effective Exchange Rate (NEER). Typically, a nominal depreciation of a country's currency leads to a temporary decrease in the relative price of its products in the global market. However, the advantages of increased competitiveness due to nominal exchange rate depreciations can be diminished by local inflation. REER aims to mitigate this challenge by adjusting NEER to accommodate differences in inflation rates.

Effective exchange rates act as a holistic measure, summarising how a country's exchange rates evolve in relation to its trading partners. This indicator provides a broad understanding of a nation's competitiveness in terms of pricing. This competitiveness is a pivotal factor influencing a country's ability to enhance productivity, encourage innovation, and elevate living standards. Notably, an increase in the REER signifies a decline in the country's competitiveness. However, it is important to stress that the index solely reflects changes in international competitiveness over time, and variations in index levels between countries have no significance.

The Dutch Disease theory predicts a REER appreciation in response to significant capital inflows. Analysing the real exchange rate trends in MENA countries could reveal whether these nations have experienced such effects.

Figure 8: Real Effective Exchange Rate Index in Selected MENA Countries (2010 = 100)



Source: Prepared by the Author based on World Bank Database, 2023

Figure 8 illustrates a significant trend in the REER of several MENA countries, including Algeria, Bahrain, Morocco, Saudi Arabia, and Tunisia, all of which experienced a notable decline in 1986 following a steady increase until 1985. This drop in REER indicates a real depreciation of their currencies against those of their trading partners, suggesting that the revenues generated from oil exports or other forms of capital inflow during this period did not lead to an appreciation of their REER. If their currencies had appreciated, it would have reduced their trade competitiveness in the global market by making their exports more expensive, a key risk associated with the so-called Dutch Disease phenomenon. The decline in REER observed in these MENA countries indicates that they managed to avoid this risk, at least in terms of currency appreciation.

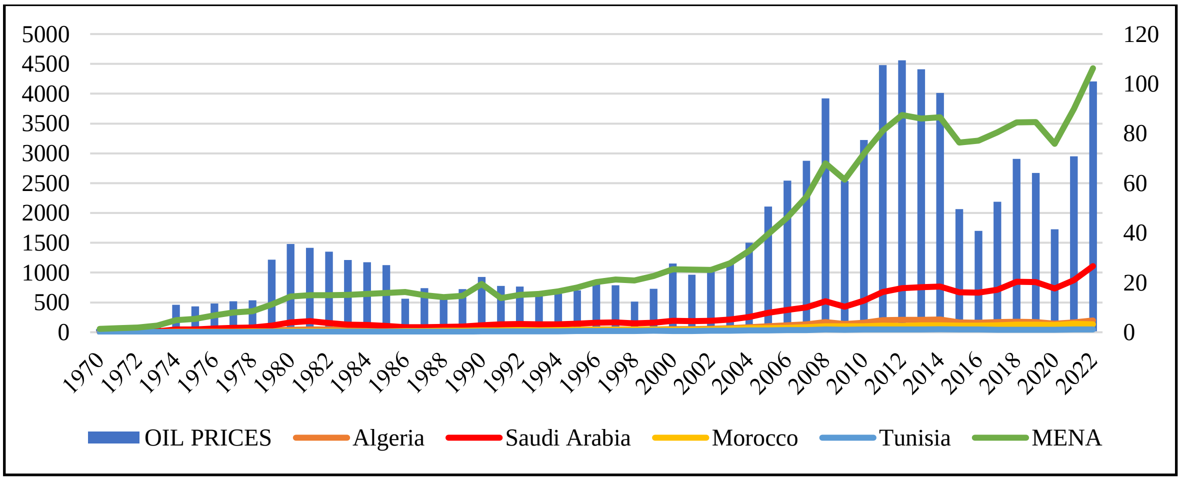
These findings align with prior research that has explored the effects of various capital inflows on the REER in MENA countries. Brahim *et al.* (2017) examine the impact of remittances on REER for MENA countries between 1980 and 2015, concluding that remittances did not cause REER appreciation and, thus, did not trigger Dutch Disease. They attributed this to several factors, including the tendency of authorities in the region to implement overvalued exchange rate policies. Overvalued exchange rates mean that the local currency buys more in terms of foreign currency. This reduces the effective value of remittances when converted to the domestic currency, meaning there is less local currency to spend per unit of foreign currency received. These policies shifted the relationship between remittances and REER, reducing the likelihood of appreciation. Moreover, a substantial portion of remittances was channelled toward the consumption of tradeable goods rather than non-tradeable goods and services, which helped prevent upward pressure on the exchange rate.

2.2.2. Symptom 2: Oil Dependency

The issue of oil dependency in the MENA region has been a central concern for decades. Since the 1930s, the region has emerged as the world's primary energy source, playing a critical role in global economic stability. The sale of energy products, mainly oil and natural gas, has been the MENA region's primary mode of engagement with international markets. According to the International Renewable Energy Agency (IRENA), the MENA region accounted for 37% of global oil production and 35% of global natural gas production in 2019. A majority of oil-producing countries in the region are members of the Organisation of the Petroleum Exporting Countries (OPEC), which regulates oil production quotas and prices among its members. Saudi Arabia, as a founding member and the largest producer in OPEC, produces over 12.2 million barrels of oil and condensate per day (MMbpd), reinforcing its influence in global energy markets.

The World Oil Report (2023) highlighted that the MENA region produced an average of 27.877 MMbpd in 2022, representing a 12.6% increase from the previous year's output. This increase underscores the region's continued centrality in the global oil market. Furthermore, the MENA region holds approximately 60% of the world's proven oil reserves and around 41% of global natural gas resources (Marotta & de Melo, 2012). These vast reserves have allowed the region to maintain its economic importance, but they also underscore its continued reliance on hydrocarbons as the main driver of economic activity.

Figure 9: MENA's GDP and Oil Prices (BRENT Trademark, in USD per barrel)



Source: Prepared by the Author based on World Bank Database, and Oil Prices retrieved from Statista Research Department, Apr 16, 2023.

The MENA region holds more proven oil reserves than any other region in the world (over 713.6 billion barrels), with the lowest discovery cost in the GCC countries, as the estimated production costs are between 3$ and 5$ per barrel of oil produced (NCUSAR, 2013).

However, this blessing also comes with a curse, as the region's heavy reliance on oil exports exposes it to various economic, social, and environmental challenges. Oil dependence has hindered the development of a diversified and competitive non-oil sector, making the MENA countries vulnerable to fluctuations in oil prices and demand. Moreover, oil dependence has contributed to the persistence of authoritarian regimes, weak institutions, and social unrest, as oil revenues have been used to maintain political patronage and suppress (Rawlings, 2020). Furthermore, according to the International Energy Agency (IEA) (2023), oil dependence has exacerbated the environmental problems of the region, such as water scarcity, land degradation, and greenhouse gas emissions, which threaten the long-term sustainability of the region's development. According to the International Monetary Fund (IMF), (2016) Arab oil exporters face three key challenges: Job creation amid rapid population growth, protecting their economies from oil price volatility and ensuring sustainable growth even after oil depletion. Moreover, most MENA oil-exporting countries depend directly and indirectly on oil production for their economic activities, fiscal revenue, export earnings, and foreign exchange.

Economic Activities: Hydrocarbons and government activities (which are fully financed by oil revenues) represent the largest share of GDP in most countries; in Libya, the share of oil in GDP is about 56% of total GDP in 2021, Iraq 42.6%, Oman 23%, Saudi Arabia 23%, and Algeria 14%. Moreover, even the non-oil activities are highly dependent on oil, as the main manufacturing industries of Arab oil exporters are oil refining, chemical processing, and mining (World Bank Database, 2023).

Fiscal Revenue: As oil is the primary source of revenue in MENA countries, in 2014, oil revenues accounted for 47% of total revenues in Yemen, 94% in Iraq, and an average of 77% for the entire group (IMF, 2016).

Exports: Oil is the main export commodity for most of the region's countries. Oil represents over 80% of total exports in half of the group's countries and more than 66% in all countries in 2021 (World Bank Database, 2023).

Therefore, the MENA countries need to adopt policies and reforms that can reduce their oil dependence and foster a more balanced and resilient development path.

2.2.3. Symptom 3: Inflation

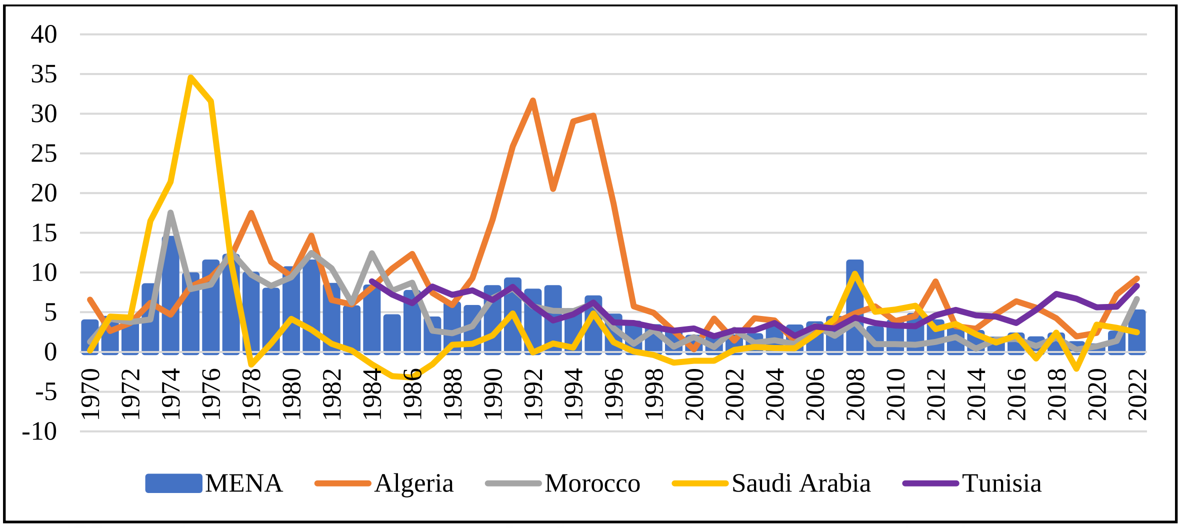
Inflation in the context of Dutch Disease is not just confined to an overall rise in prices but often manifests disproportionately in the non-tradeable sector. Non-tradeable goods and services, such as housing, healthcare, and public utilities, are typically consumed domestically and cannot be easily imported or exported. The resource boom leads to heightened demand for these goods and services as income levels rise within the economy. This demand surge drives up their prices, contributing to inflation. As a result, the cost of living within the country may rise dramatically, affecting the overall well-being of citizens, particularly those who are not directly benefiting from the resource boom (Van Wijnbergen, 1984).

The resulting inflationary pressures can create significant imbalances in the economy, particularly when coupled with rising inequality. Wealth generated from the natural resource sector tends to concentrate in the hands of a few, often those directly involved in the resource extraction industries or related government officials. Meanwhile, workers in the shrinking manufacturing and agricultural sectors may see their wages stagnate or even decline, worsening income inequality. As inflation erodes the purchasing power of lower- and middle-income households, their standard of living may deteriorate, leading to social and political instability over time.

Moreover, inflation caused by Dutch Disease can have long-term consequences for the broader economy. Persistent price increases in the non-tradeable sector can reduce the country’s competitiveness, making it more difficult to attract foreign investment in industries outside the resource sector. Foreign companies may be deterred by the high costs of doing business in the country, limiting opportunities for diversification and leaving the economy overly dependent on natural resources. This vulnerability can expose the country to external shocks, such as fluctuations in global commodity prices, which can lead to economic downturns when resource revenues decline.

Policymakers must therefore carefully manage the effects of inflation and Dutch Disease by implementing sound macroeconomic policies. Strategies such as sterilising resource revenues to prevent excessive currency appreciation, investing in infrastructure and education to support other sectors, and promoting trade policies that encourage diversification can help mitigate the impact of Dutch Disease. Additionally, fiscal measures aimed at controlling inflation, such as maintaining a balanced budget and avoiding excessive public spending, are crucial for ensuring long-term economic stability (Mien & Goujon, 2022). This highlights the importance of addressing the root causes of inflation within the context of Dutch Disease.

Figure 10: Inflation in MENA, Consumer Price Index (annual %)



Source: Prepared by the Author based on World Bank Database, 2023.

The MENA region, known for its abundance of oil and gas resources, has frequently grappled with inflationary pressures tied to the phenomenon of Dutch Disease, particularly during periods of elevated oil prices and revenues. The economic booms that followed global oil price shocks, such as those seen in 1974 and 2008, led to rapid increases in government revenues and significant inflation within the region. According to World Bank Database, the average annual inflation rate in the MENA region surged to 14.24% in 1974, following the oil embargo that quadrupled oil prices. Similarly, during the global financial crisis in 2008, when oil prices spiked again, the MENA region experienced an average inflation rate of 11.27%, highlighting the direct relationship between oil revenues and inflationary pressures.

These periods of inflation were largely driven by increased government spending, rising demand for non-tradeable goods and services, and a shift in economic resources toward the booming oil sector. In contrast, during periods of declining oil prices, such as in 2016 and 2020, the MENA region experienced significantly lower inflation rates. In 2016, as global oil prices plummeted due to oversupply and weak demand, the average annual inflation rate in the region dropped to 2%. Similarly, in 2020, when the COVID-19 pandemic caused a dramatic collapse in oil prices and revenues, the inflation rate fell to just 0.7%. These years of oil slumps underscore the critical role that oil price fluctuations play in shaping inflationary trends across the MENA region.

At the national level, inflation rates are in line with the overall trend; Saudi Arabia experienced high inflation in 1975 due to the oil boom that followed the 1973 oil crisis, which significantly boosted oil revenues. This sudden wealth led to a surge in government spending and investment in infrastructure, triggering demand-pull inflation. Additionally, the economy struggled to absorb the rapid influx of capital, leading to overheating and price increases (Hitti & Abed, 2002). In Algeria during the 1990s, high inflation resulted from a combination of structural economic issues, political instability, and a transition to a market-orientated economy; moreover, reduced foreign reserves weakened the currency and caused cost-push inflation.

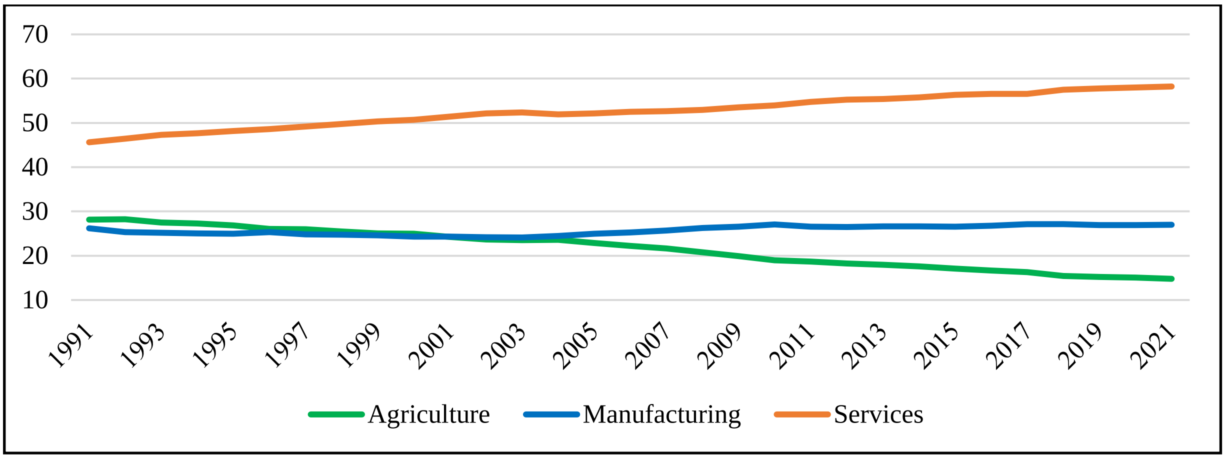
The sharp contrast between these inflation rates during oil booms and busts reflects the vulnerability of oil-dependent economies to external shocks. When oil prices are high, the increased revenues fuel inflationary pressures, while low oil prices often lead to reduced public spending and more stable price levels. This cyclical nature of inflation in the MENA region highlights the challenges faced by policymakers in managing the effects of Dutch Disease and underscores the importance of economic diversification. Without effective diversification strategies, these countries remain highly susceptible to the volatile nature of global oil markets, which can exacerbate inflation and undermine long-term economic stability.

2.2.4. Symptom 4: Rise in the Services Sector

According to Dutch Disease theory, the booming resource sector drives up wages, significantly impacting the economy. This phenomenon leads to labour migration from manufacturing and agriculture, resulting in reduced employment in those sectors. Over time, this trend worsens as manufacturing loses competitiveness, a manifestation of the resource movement effect.

Resource movement entails reallocating essential production factors, such as labour and fixed capital, from various sectors to the thriving resource sector. As a result, output and production in the displaced sectors decline, while the resource sector experiences rapid growth. Furthermore, this shift increases demand for non-traded products, particularly services. If non-tradeable products exhibit positive income elasticity, the additional income generated by the booming sector fuels a significant rise in demand for services, as those benefiting from the boom redirect part of their increased income towards services consumption, which eventually leads to an over expansion of the services sector.

Figure 11: Distribution of Average Employment in MENA

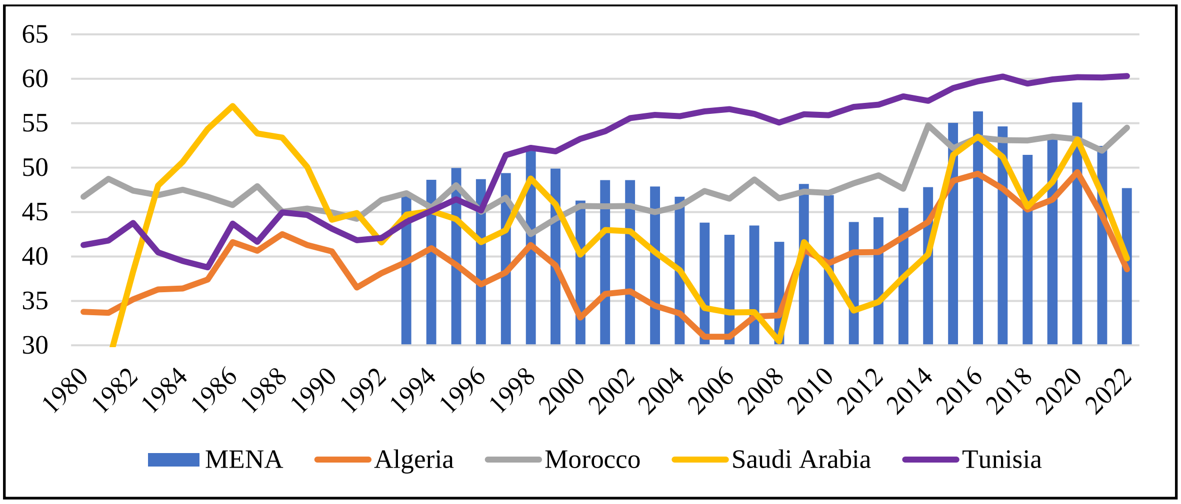


Source: Prepared by the Author based on World Bank Database, 2023.

Figure 11 highlights a significant transformation in the employment structure within the MENA region, revealing distinct sectoral shifts over recent decades. Most notably, employment in agriculture has experienced a sharp, sustained decline, signalling a movement away from traditional agrarian-based employment. This trend reflects broader structural shifts as the region has moved toward more diversified economic activities. In contrast, the manufacturing sector's employment share has remained relatively stable over time, indicating limited expansion and possibly constrained growth dynamics in manufacturing and related industries. However, the most pronounced change is observed in the services sector, which has become a central driver of employment. Since 1991, employment in services has increased by over 13%, signalling a major reorientation of labour resources toward this sector.

These sectoral changes align with the symptoms commonly associated with Dutch Disease, where an economic focus on particular sectors leads to a relative decline in others. Specifically, the marked reduction in agricultural employment and stagnation within industry, combined with significant growth in services, typifies the resource movement and spending effects of Dutch Disease.

Figure 12: Services, Value Added in MENA (% of GDP)



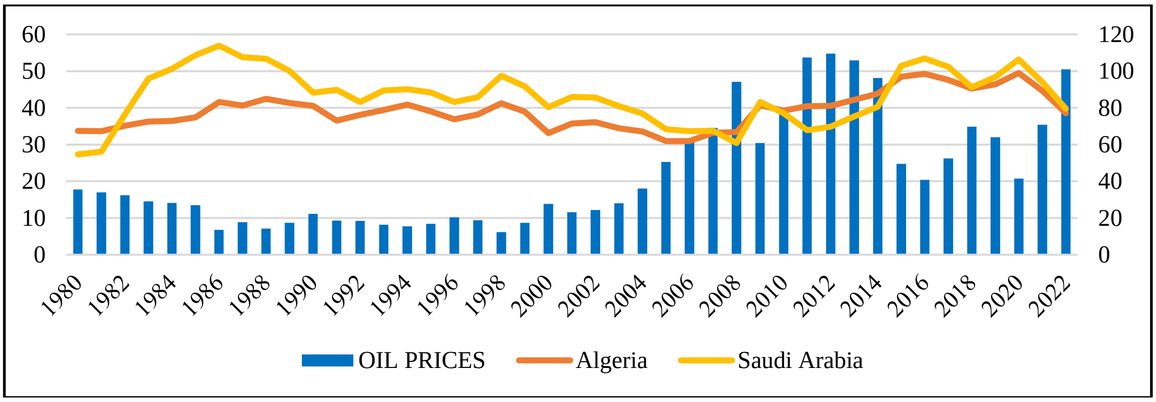
Source: Prepared by the Author based on World Bank Database, 2023.

In Figure 12, the trend in the services sector's GDP contribution within the MENA region sheds light on broader structural changes. Despite a slight decline in the region's overall services share from 52% in 1998 to 41% in 2008, a remarkable recovery led to a peak of 57.32% by 2020. This growth trajectory suggests that services have outpaced agriculture and manufacturing in terms of expansion, which grew only by 1% and 0.45%, respectively, during the same period. This indicates a stronger reliance on services-oriented activities and highlights a shift in economic focus within MENA economies, as further evidenced in Figure 13.

Analysing these trends at the country level further underscores the varied impacts across resource-rich and resource-poor economies. In oil-rich countries like Algeria and Saudi Arabia, the services sector's share of GDP initially saw a decline in 1990 and continued to fall until reaching a historical low of 30% in 2008. Following 2008, however, both countries witnessed a steady rise in their services sectors: By 2020, Saudi Arabia's services share had surged to 53%, and Algeria's reached a record high of 49.5%. These increases indicate a possible adjustment in economic priorities following the global economic changes of the late 2000s.

In contrast, resource-poor countries like Morocco and Tunisia showed a steady upward trend in their services sector contributions without significant declines over the same period. Tunisia, in particular, saw a remarkable increase from 41% services share in 1981 to 60% by 2022, while Morocco's growth was more gradual, rising from 46% to 54% over the same period. This steady expansion underscores a consistent shift toward services in these economies, potentially driven by sustained domestic demand and diversified economic strategies.

Figure 13: Services Value Added in Algeria and Saudi Arabia Compared to Oil Prices

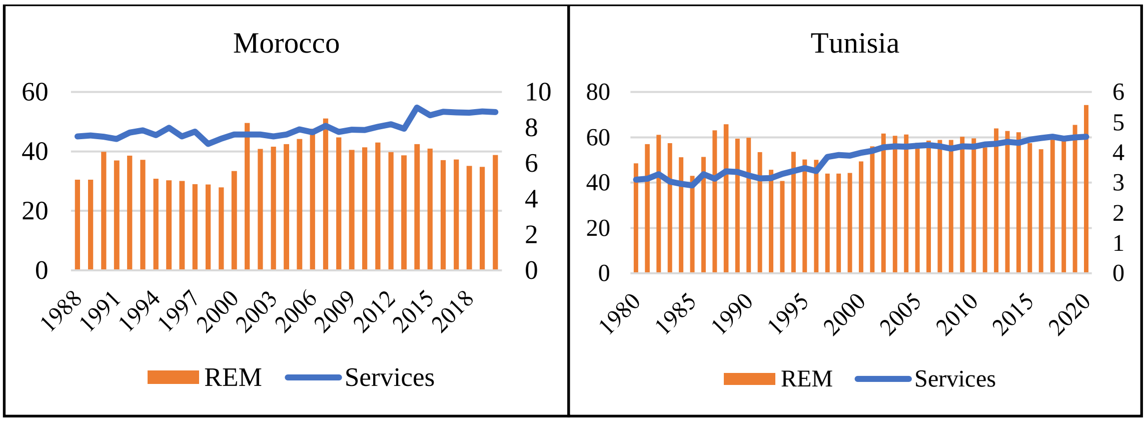


Source: Prepared by the Author based on World Bank Database, 2023.

In Figure 13, the increase in the services sector's share of GDP in Algeria and Saudi Arabia from 1980 to 2022 appears largely independent of fluctuations in oil prices, indicating that other factors may be driving this trend. In Saudi Arabia, the services sector's share averaged 46% in the 1980s, 44% in the 1990s, 37% in the 2000s, and 44% in the 2010s. In Algeria, these figures were 37%, 39%, 34%, and 44%, respectively. Meanwhile, oil prices experienced significant and stronger volatility, ranging from $35 per barrel in 1980 to $12 in 1998, peaking at $109 in 2012, and stabilising around $100 in 2022. This suggests a less clear relationship between services sector growth and oil prices.

The disconnect between the services sector and oil prices implies that its expansion may be influenced by factors beyond oil price movements. Potential explanations include the maturation of the services sector before 1980, structural changes within the economy, and deliberate government policies aimed at diversification. Additionally, factors such as increased urbanisation, a growing population, and rising domestic demand for services likely contribute to the sustained growth of the services sector, independent of oil price volatility.

Figure 14: Services Value Added in Morocco and Tunisia Compared to Remittances



Source: Prepared by the Author based on World Bank Database, 2023.

The same pattern is observed in resource-poor countries, Morocco, and Tunisia. When comparing the services sector's share of GDP to remittance inflows from 1980 to 2020 in Figure 14, no clear relationship emerges between the two variables over this period.

2.2.5. Symptom 5: Slowdown in the Industrial and Agricultural Sectors

Dutch Disease refers to a phenomenon in which the rapid development and growth of a specific sector, usually a natural resource-based industry like oil or gas, leads to a detrimental impact on other sectors of the economy, particularly manufacturing and agriculture. This situation arises because the booming sector generates substantial revenues, often leading to an inflow of foreign capital. As these revenues pour into the economy, the local currency appreciates, meaning its value strengthens relative to foreign currencies. This appreciation has far-reaching consequences for the economy, especially for sectors outside the booming one.

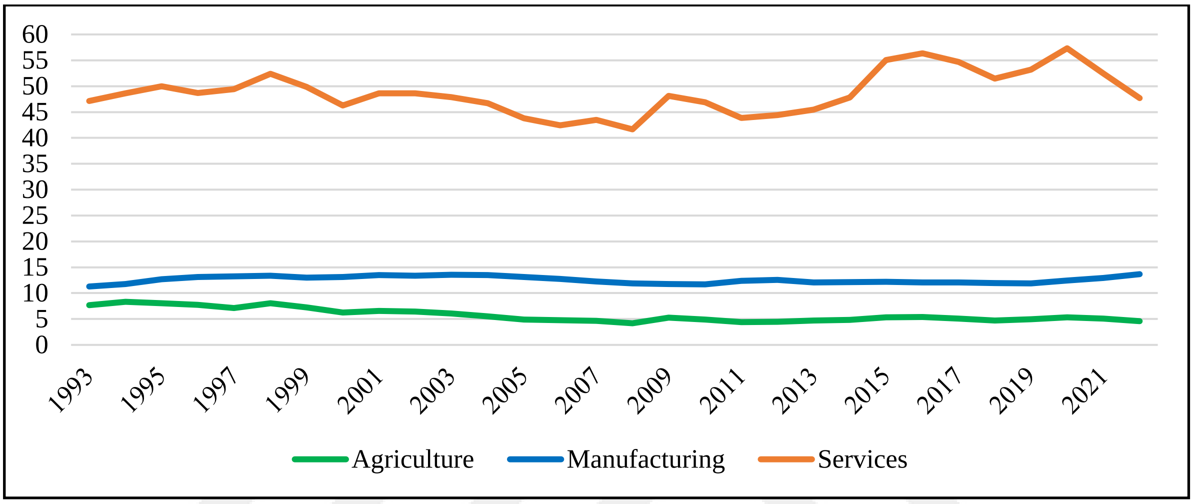
When a country's currency appreciates, its exports in other sectors, such as manufacturing or agriculture, become more expensive on the global market, making them less competitive internationally. At the same time, imports become cheaper, leading domestic consumers and businesses to increasingly purchase foreign goods. This shift in consumer and business behaviour further exacerbates the decline of domestic industries that are not benefiting from the resource boom. As a result, the non-resource sectors, those that rely on export competitiveness, like manufacturing, suffer from reduced demand both domestically and internationally, often leading to stagnation or outright decline in these industries.

The core mechanism behind Dutch Disease, therefore, revolves around the distortion of the exchange rate and the subsequent misallocation of economic resources. The resource boom drives up wages and capital costs in the booming sector, drawing labour and investment away from other industries. This process is often referred to as the "Resource Movement Effect," where the booming sector attracts resources that would otherwise support diverse economic activity, leading to a reduction in productivity and growth potential in other areas of the economy. Over time, this can result in a structural imbalance, where an economy becomes overly dependent on the resource sector, heightening its vulnerability to global price fluctuations and external shocks.

In many cases, the manufacturing sector is the most affected by Dutch Disease. As the sector becomes less competitive due to the stronger currency and rising production costs, industrial growth may stagnate, leading to job losses and reduced economic diversification. This scenario can hinder long-term economic development, as an over-reliance on natural resources may prevent the economy from developing a robust industrial base capable of sustaining growth during downturns in the resource sector.

Ahmad Bajwa *et al.* (2019) underscore the critical risks associated with Dutch Disease, emphasising that economies dependent on natural resource sectors must implement policies to mitigate its effects. Such policies could include measures like exchange rate management, strategic investment in other sectors, and fostering a diverse economic base that is resilient to commodity price shocks. Without such measures, economies can become trapped in a cycle of resource dependency, undermining their long-term growth prospects and economic stability.

Figure 15: Services, Manufacturing and Agriculture Value Added in MENA (% of GDP)

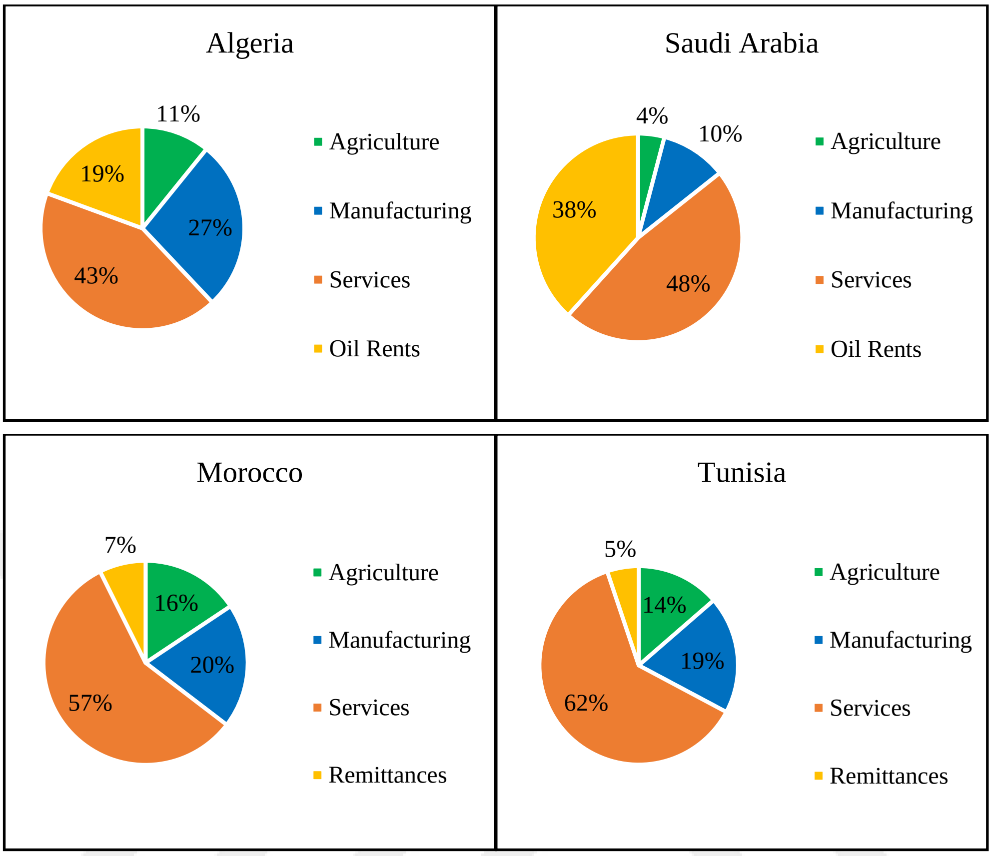


Source: Prepared by the Author based on World Bank Database, 2023.

Figure 15 demonstrates shifts in the economic structure of the MENA region. From the mid-2000s to 2019, the manufacturing share of GDP exhibited a steady decline, reflecting challenges in diversifying beyond oil-related industries. However, this trend reversed by 2022, with manufacturing reaching its highest share (13.66%). This recovery is surprising, as most manufacturing activities in the region remain concentrated in oil refining, chemicals, and mining, while non-oil industries are still developing and immature (Ahmad Bajwa *et al.,* 2019).

Meanwhile, agriculture's share of GDP fell steadily, reaching a low of 4.17% in 2008. On the other hand, services have always been the dominant sector in the region, peaking at 57.32% of GDP in 2020, signifying broad, service-oriented economies. This structural transformation has been shaped by factors such as the global financial crisis of 2008, which accelerated de-industrialization trends in the region, and recent efforts to boost non-oil industries.

Figure 16: Average GDP Composition from 1980 to 2020 in MENA Countries



Source: Prepared by the Author based on World Bank Database, 2023.

The average GDP composition from 1980 to 2020 across the MENA countries (Algeria, Saudi Arabia, Morocco, and Tunisia), reveals distinctive economic structures and highlights key factors shaping each economy's resilience and vulnerabilities.

Algeria's GDP composition underscores a notable reliance on both oil rents and manufacturing. While services represent the largest sector, the significant share of oil rents (19%) suggests that Algeria's economy is heavily influenced by the oil sector. The relatively low percentage of agriculture in GDP reflects the country's limited focus on this sector, likely due to arid climate conditions and limited arable land, which represents 19% of total land (Ministry of Agriculture of Algeria, 2019). The substantial manufacturing share could indicate efforts to diversify, but the reliance on oil rents points to exposure to external oil price fluctuations, often seen in Dutch Disease symptoms, which could affect other sectors' competitiveness.

Saudi Arabia's composition is strongly weighted toward oil rents, making up 35.8% of GDP, which is higher than in Algeria. The comparatively low share of agriculture and manufacturing highlights the economy's historical focus on oil production, with limited emphasis on other sectors. However, the significant share of services suggests efforts to support economic diversification, particularly through initiatives like Vision 2030, which aims to reduce dependency on oil (Alhumaid, 2023). The services sector likely includes areas such as tourism, finance, and public administration, which have been prioritised as part of the Kingdom's economic transformation plan.

Morocco's economic structure is unique within this group, as it has no oil rent dependency and instead features a higher reliance on agriculture (13%) and a robust services sector (57%). Manufacturing also plays a significant role, suggesting a diversified industrial base. The substantial share of remittances (7%) reflects Morocco's strong ties with its diaspora, which helps to support domestic consumption and balance foreign currency needs. This structure likely provides Morocco with more economic stability and resilience, though reliance on remittances could expose the economy to global labour market fluctuations.

Tunisia's GDP composition, on the other hand, shows that services comprising the largest component of GDP (62%), making it the largest contributor. Like Morocco, Tunisia lacks oil rents and shows greater reliance on manufacturing and services, reflecting efforts to cultivate a diverse economy. Agriculture plays a smaller role but remains significant. Remittances contribute to Tunisia's GDP (5%), though less than in Morocco, providing an additional source of stability for household income and consumption.

CHAPTER THREE

3. LITERATURE REVIEW

3.1. Dutch Disease Stemming from Oil

The discovery of natural resources such as oil and gas has long been regarded as a blessing, bringing significant revenue and increasing the possibility of economic expansion. However, as the Netherlands' example indicates, a rapid and sudden inflow of resource revenues can have a severe impact on a country's economy and society. Several MENA countries have faced similar circumstances in recent years, where the discovery of natural resources has led to an overreliance on a single export, usually leading to a decline and deterioration in other areas of the economy. This has sparked concerns about the long-term sustainability of these economies as well as their capacity to diversify and adapt to changing global conditions.

The Netherlands provides a striking example of how a country can suffer negative consequences from its abundant natural resources. Despite the high revenues generated from gas extraction, the country experienced several economic challenges, such as a strong appreciation of the exchange rate, a decline in the industrial sector, and a significant increase in the unemployment rate. These issues prompted economists to study and understand the underlying mechanisms behind this phenomenon, which resulted in a significant body of literature on the subject. Researchers have identified two main streams of study when examining the natural resource curse. The first stream focuses on economic reasons, and the second on political explanations (Badeeb, 2017: 123). Scholars have identified various economic factors that contribute to the resource curse, such as the Dutch Disease, persistent trends in global prices; fluctuations in commodity prices; and neglect of education and manufacturing, which have been shown to have long-lasting effects on the growth rates of countries (Frankel, 2010; Ploeg, 2011). On the other hand, the second stream of research focuses on political reasons, which include rentier states, ineffective institutions, and the abuse of power for personal gains (Gilberthorpe & Papyrakis, 2015).

Although the first studies to investigate the negative impact of the natural resource boom on the economy were conducted by Meade and Russell (1957) and Gregory (1976), who used the Australian economy as a case study, the model developed by Corden and Neary (1982) is widely recognised as the seminal and principal framework for Dutch Disease theory (Abdlaziz *et al.*, 2018: 243). Following this seminal work, many studies have been done since then. Stevens (1986) conducted one of the most influential studies that aimed to understand and reveal the mechanisms of the negative effects resulting from excessive dependence on oil as a basis for development in 12 Arab countries. The author's extensive analysis revealed that the Dutch Disease phenomenon was indeed present in these countries. Furthermore, the findings of the study have been further corroborated by subsequent studies, indicating the persistent and widespread nature of the Dutch Disease symptoms in the Arab countries and beyond.

Among the studies, Krugman (1987) argues that the loss of competitiveness during exchange rate appreciations may be tremendously difficult to re-establish during subsequent downturns. Gelb (1988) highlights that mineral booms are extremely harmful as the economic benefits gained during the upswing are typically outweighed by the harm done during the downswing. Moreover, throughout the oil boom, oil exporters suffer severe economic slowdowns and are significantly outperformed by low-income Asian and East Asian oil importers. In another study, Maddison (1991) reports that Australia's and North America's resource advantages have been decreasing over time, notwithstanding their effect on per capita GDP levels and rates of development. Furthermore, despite having 150 times more resources and a head start in economic growth, Australia has a lower per capita income as compared to countries that lack such resources, such as Japan. As per the findings of certain scholars, the consequences of Dutch Disease are not restricted to the tradeable sector alone, this phenomenon can also impact the non-tradeable sector and services due to the appreciation of the real currency and the surge in government spending. Consequently, it becomes challenging to make adjustments in the economy as a result of the massive government debt and spending, along with the contraction of the manufacturing sector. This further worsens the adverse effects of Dutch Disease, making it imperative to address the issue through appropriate policy measures (Frankel, 2010: 34).

Furthermore, much literature emphasises that the effects of Dutch Disease can vary depending on the size and composition of the economy, the degree of trade openness, and the quality of institutions. Ross (2001) claims that oil harms democracy more severely in poor governments, with three channels linking it to authoritarianism: First, it helps extractive states keep low tax rates and high spending to eliminate democracy claim pressures; second, it has a repression effect by enforcing internal security to protect rulers' positions and their gains; and third, it has a modernisation effect since it is proven that natural resource rents fail to bring democracy and social welfare. According to Arezki and Van der Ploeg (2010) and Arezki and Gylfason (2011), the effectiveness of governmental bodies plays a critical role in determining the long-term effects of natural resource booms on economic growth.

The literature also emphasises that windfall gains are often poorly managed by governments, as they tend to view these earnings as inexhaustible, leading to a rise in expenditure plans that is difficult to reverse, resulting in severe macroeconomic imbalances, and a deterioration of economic welfare (Cuddington, 1989: 143). Additionally, governments frequently struggle to distribute the revenues gained equitably and invest it in the right sectors to encourage long-term economic growth (Kolstad & Wiig, 2011). Moreover, natural resource booms have been proven to exacerbate economic inequality, fuel corruption and rent-seeking behaviour, strengthen authoritarian regimes, escalate particular types of malfeasance, and incite violent unrest in developing and emerging economies (Ross, 2015).

In the first section of this chapter, a thorough analysis encompassing political and economic factors was conducted to provide a comprehensive understanding of the challenges encountered by resource-rich countries and identify potential effective policies to mitigate the devastating impacts of the resource curse. However, since the primary objective of this study is to examine Dutch Disease, the subsequent portion of this chapter will predominantly concentrate on the economic aspects of the resource curse. Therefore, the focus will shift towards exploring existing research on Dutch Disease and its implications in the MENA region. By doing so, a more targeted and specific investigation aligned with the central aim of this study is attained.

Rodriguez (2006) examines whether the Saudi Arabian economy suffered from the Dutch Disease. After analysing some macroeconomic indicators, the study reports evidence of Dutch Disease symptoms such as the large portion of oil revenues in total government revenues, real effective exchange rate fluctuations, and the upsurge of the non-tradeable industries with a significant rise in recruitment of foreign labour. Furthermore, the study inspects the resource allocation effects and spending effects and emphasising that contrary to expectations, there was a boost in the agricultural and manufacturing sectors. The study concludes that although Saudi Arabia had all of the symptoms of the Dutch Disease, the economy did not suffer from it.

Iimi (2007) investigates whether countries rich in natural resources exhibit slower economic growth compared to those with fewer natural assets. To explore this, the study gathers data from 89 countries, using the real per capita growth rate as the dependent variable and five independent variables: Natural resource abundance, governance indicators, population growth, tax rates, and trade openness. The findings indicate that many resource-rich nations struggle to achieve targeted growth due primarily to corruption, conflict, rent-seeking behaviours, and the effects of Dutch Disease. The study ultimately concludes that mitigating these adverse impacts requires robust legislative frameworks, transparency, and economic diversification strategies, which can foster resilience and sustainable growth in resource-dependent economies.

Dobrynskaya and Turkisch (2009), building on prior research linking excessive oil dependence to deteriorating economic growth, examine whether this theory applies to the Russian economy, a major global oil exporter. Analysing data from 1999 to 2007, the study demonstrates clear evidence of Dutch Disease symptoms in Russia. These symptoms are most evident in the real appreciation of the Russian rouble, a contraction in manufacturing employment, expansion in the services sector, and rising real wages.

Otaha (2012) examines why Nigeria’s oil exports, despite generating substantial revenue, have not significantly improved either the standard of living or the broader economy. The article identifies key issues and challenges faced by nations that rely heavily on oil as their primary source of income. One major concern is the occurrence of “Dutch Disease” during periods of high oil prices. This phenomenon involves the appreciation of the exchange rate, a negative balance of payments when oil prices decline, and reduced incentives to invest in non-oil sectors such as agriculture and manufacturing. Nigeria has experienced all the symptoms of this condition. Since the rise of oil exports, the agricultural sector has deteriorated, leading to a heavy reliance on imports. This dependence on oil has fostered short-sighted economic policies, contributing to both political instability and economic underperformance.

Apergis *et al.* (2014) investigate the impact of oil sector growth on agricultural value-added across select MENA countries from 1970 to 2011. By employing panel cointegration tests, the study investigates the long-term relationship between oil revenues and agricultural sector performance. The results demonstrate a significant negative association over the long term, suggesting that booms in the oil sector frequently contribute to a gradual decline in agricultural activity, a phenomenon often referred to as de-agriculturalisation.

Allegret and Benkhodja (2014) expand on previous analyses by examining the susceptibility of both highly and weakly oil-dependent nations to Dutch Disease, as well as the effectiveness of various monetary policies in mitigating its effects. By studying 16 oil-exporting countries, including six from the MENA region, and classifying them by their fuel export ratios to total goods exports and oil export ratios to GDP, the results confirm that Dutch Disease predominantly affects highly oil-dependent economies, with several experiencing a decline in manufacturing output following oil price shocks. The study also highlights that the optimal monetary policy to counter Dutch Disease varies by country characteristics. Inflation-targeting policies are found to be more effective for larger economies, such as Algeria and Saudi Arabia. Conversely, smaller, open economies such as Gabon, Kuwait, Oman, and Venezuela have favoured exchange rate policies.

Gasmi and Laourari (2017) conduct a comprehensive study to determine whether the Algerian economy exhibits symptoms of Dutch Disease. Covering an extensive period of 56 years, from 1960 to 2016, the researchers adopt a detailed approach by separately analysing the spending and resource movement effects. Despite this thorough investigation, their findings do not confirm the presence of Dutch Disease in Algeria, suggesting resilience or unique dynamics in Algeria’s economic structure that mitigate the adverse effects often associated with resource dependence.

Karamelikli *et al.* (2017) investigate the relationship between oil exports, economic growth, imports, and non-oil exports in 12 OPEC member countries from 1972 to 2013, considering cross-sectional dependence. Using panel estimations, they find that oil exports positively impact economic growth, suggesting that Dutch Disease is not universally evident across OPEC nations. While oil exports raise aggregate demand and stimulate imports, the relationship between oil and non-oil exports varies by country. For example, Algeria, Libya, Qatar, Saudi Arabia, and Venezuela exhibit a positive relationship, while Iran, Iraq, and Nigeria show a negative association due to factors such as political instability, poor institutional frameworks, and misallocated oil revenues.

Allegret *et al.* (2018) investigate the Dutch Disease effect in small, open oil-exporting economies, contributing to the literature with a DSGE model based on balanced-growth path theory. This model uniquely incorporates an oil stabilisation fund, an oil price rule, and a fiscal rule, alongside alternative monetary policies, to assess their effectiveness in mitigating Dutch Disease following a positive oil price shock. Their findings indicate that Dutch Disease symptoms, particularly through the spending effect, emerge only under an inflation-targeting regime. In contrast, an expansionary fiscal policy can improve the economy by enhancing productivity in the manufacturing sector, suggesting that fiscal measures are vital for resilience against oil-induced economic imbalances.

Cheratian *et al.* (2019) analyse the impact of oil price shocks on unemployment rates in the oil-exporting and oil-importing countries within the MENA region from 1991 to 2017. Their findings reveal that in the short run, positive oil price shocks increase unemployment rates in oil-exporting countries. In the long run, however, positive oil price changes significantly raise unemployment in both oil-exporting and oil-importing nations. Negative oil price changes, on the other hand, show no significant effect. These results align with the Dutch Disease hypothesis, suggesting that oil price volatility can exacerbate unemployment in resource-dependent economies.

Udemba and Yalçıntaş (2022) investigate the sustainable development performance in Norway and Algeria, as both considered net oil-exporter countries. The study employs two time series models, analysing quarterly data from 1999Q1 to 2018Q4 for Algeria and from 1999Q1 to 2019Q4 for Norway. Utilising the ARDL dynamics and Bounds testing, the authors find evidence of Dutch Disease symptoms in both economies. In Algeria, negative relationships are identified between economic growth (GDP), government spending, crude oil prices, and agricultural performance. Conversely, in Norway, similar negative relationships are observed between these variables and the manufacturing sector.

Alssadek and Benhin (2022) investigate the effects of oil booms on manufacturing sub-sectors in oil-rich developed and developing countries, with a focus on medium-high and high-technology exports. They analyse data from 39 countries (1990–2015) for medium-high technology and 31 countries (1990–2016) for high-technology exports, employing a fixed effects model with Driscoll-Kraay standard errors to address common panel data issues. The findings reveal that oil booms significantly reduce both export categories globally, confirming the resource movement effect of Dutch disease. This negative impact is observed in regions including the Middle East, Africa, Asia, and Europe, while Latin American countries exhibit an increase in both export types, challenging the Dutch disease narrative. The study highlights that, in order to mitigate these adverse effects, policymakers are advised to enhance institutional quality, invest in human capital, diversify economies, and improve manufacturing investments, thus enabling the effective utilisation of oil wealth to foster economic growth and development.

Ashour *et al.* (2024) investigate the Dutch Disease Effect by analysing REER and evaluating preferred Exchange Rate Regimes (ERR) for oil-exporting countries, taking into account time effects and stages of development. Using yearly data from 51 oil-exporting nations between 2001 and 2010, the authors employ a dynamic panel threshold model for empirical estimation. Their findings reveal a nonlinear relationship in net oil-exporting countries, indicating that a real exchange rate increase of over 3% from the previous year correlates with a decline in non-oil exports, thereby confirming the presence of the Dutch disease phenomenon. Furthermore, the risk of Dutch Disease Effect is heightened under a fixed ERR, particularly in developing countries and during the early stages of oil exporting.

3.2. Dutch Disease Stemming from Remittances

The phenomenon of Dutch Disease is commonly linked to the discovery of natural resources, but it can also arise from any significant increase in foreign currency inflows, such as a sudden rise in commodity prices, technological progress, foreign aid, foreign investment, remittances from workers, or tourism. According to Al-Sabah (1988) observations, the Dutch Disease is not only limited to oil or gas exporting countries but can occur in different scenarios. For instance, in the 1960s, natural gas discovery in the Netherlands resulted in a rise in the real exchange rate due to salary gains that surpassed those in neighbouring like West Germany. This resulted in a drop in Dutch manufacturing and a strain on the export industry. Similarly, in Japan throughout the 1960s, the expansion of technologically advanced segments of the industrial sector harmed slower-growing tradeable industries like agriculture. Also, the rise in the export of Swiss bonds and money in the 1970s led to a significant appreciation of the Swiss franc, which harmed traditional Swiss exports and sectors that compete in the foreign market.

Furthermore, economists have delved even deeper into history and used the Dutch Disease framework to examine historical events such as the influx of treasures from the Americas to Spain in the 16th century and the discovery of gold in Australia in the 1850s (Ebrahimzadeh, 2012).

Research has shown that remittances can significantly contribute to development in recipient countries by stimulating economic growth and reducing poverty. However, when remittance flows become disproportionately large relative to the economy, negative consequences may arise. Paus (1995) notes that in El Salvador, Dutch Disease driven by international aid and remittances, along with falling real wages and declining productivity, presents major challenges to inclusive growth. Amuedo-Dorantes and Pozo (2004) explore the impact of remittances on the real exchange rates of 13 Latin American and Caribbean nations, finding that remittances can harm the export sector by undermining international competitiveness, similar to the concerns raised by Dutch Disease or Resource Boom models, where resource discoveries lead to real exchange rate appreciation and resource shifts from traded to non-traded sectors.

Lopez *et al.* (2008) highlight one of the primary risks of remittances: Real exchange rate appreciation, which diminishes export sector competitiveness. Similarly, Acosta *et al.* (2009) focus on El Salvador and found that remittance inflows, regardless of whether they stem from altruism, decrease labour supply while increasing demand for non-tradeable. This rise in demand elevates prices in the non-tradeable sector, encouraging labour reallocation away from tradeable sectors, which is a classic example of Dutch Disease. Lartey *et al.* (2012) confirm that remittances can provoke spending effects and real exchange rate appreciation, with the resource shift to non-tradeable goods being more evident in fixed nominal exchange rate regimes.

Fayad (2010) investigates the potential Dutch disease effect arising from remittance inflows in net labour-exporting countries within the MENA region, employing the dynamic Pooled Mean Group (PMG) estimator. The analysis takes into account the established interaction between international migration and foreign direct investment (FDI), acknowledging the simultaneous occurrence of remittance and FDI inflows. The findings suggest that while remittances generally contribute to an appreciation of the real exchange rate, this effect weakens as productivity-enhancing FDI inflows introduce a depreciative influence. The study further identifies a reverse Dutch Disease effect due to significant remittance outflows from MENA countries that are net labour importers and key oil producers.

Ball *et al.* (2013) criticise earlier research on remittances for frequently neglecting the influence of exchange rate regimes. Their study, which combines theoretical modelling with panel vector autoregression across 21 emerging markets, suggests that remittances under fixed exchange rate regimes can lead to short-term inflation, GDP growth, an increase in domestic money supply, and appreciation of the real exchange rate. In contrast, under flexible regimes, remittances tend to reduce inflation, boost GDP, and cause the real exchange rate to appreciate while leaving the money supply unchanged. The empirical evidence supports these theoretical predictions, underscoring the importance of exchange rate regimes in determining remittances' short-term economic effects.

Chnaina and Makhlouf (2015) investigate the impact of remittances on the real effective exchange rate. Utilising cointegration techniques with structural breaks, based on Johansen *et al*.'s methods, they argue that a 1 percentage point increase in remittances relative to GDP leads to a 0.39% appreciation in Tunisia's REER, thus supporting the Dutch Disease hypothesis.

Nefzi *et al.* (2020) analyse the influence of remittances on the REER in Tunisia, Morocco, and Algeria between 1980 and 2015. The authors conclude that remittances do not cause a long-term appreciation of the REER in these countries, contrary to what is observed in Latin American nations. Instead, remittances led to a slight depreciation, indicating no Dutch Disease risk from remittances in these Maghreb countries.

Anwar and Mang (2022) investigate the impact of remittances on the RER using data from 67 studies that comprised 426 estimates. Their findings reveal that remittances tend to appreciate the RER, but the magnitude of the effect varies depending on the country. East Asia and the Pacific regions showed a significantly larger effect compared to the global estimates, while Latin America and the Caribbean regions exhibited a significantly smaller effect. Additionally, their analysis emphasises that lower-middle-income countries experienced a positive impact of remittances on RER appreciation. The researchers conclude that publication selection bias is unlikely in the literature and that a legitimate connection exists between remittances and RER appreciation.

Fisera and Workie Tiruneh (2023) apply a heterogeneous panel cointegration method to a sample of 134 developing and emerging economies to assess the effect of remittances on the real exchange rate. Their findings suggest that remittances could contribute to the Dutch Disease phenomenon. They also highlight those countries with floating exchange rate regimes, greater economic freedom, and more advanced financial systems experience less long-term real exchange rate appreciation due to remittance inflows.

CHAPTER FOUR

4. DATA, RESEARCH METHODOLOGY, AND EMPIRICAL RESULTS

This chapter provides a detailed examination of the datasets, variables, methodology, and findings related to the investigation of Dutch Disease in selected MENA countries. It is divided into four parts: The first part introduces the data description and sources; the second part demonstrates the methodology and econometric model; the third presents the study's results; while the fourth part presents the Discussion of the Results.

4.1. Data Description

The primary aim of this study is to deepen the understanding of how Dutch Disease manifests through substantial foreign inflows, such as oil rents in resource-rich economies and workers' remittances in those with fewer natural resources. Although Dutch Disease was first identified decades ago, its specific impacts in the MENA region remain inconclusive, leaving a gap in understanding this phenomenon particularly for these economies. The study focuses on four MENA countries: Algeria and Saudi Arabia as oil-rich nations, and Morocco and Tunisia as oil-poor nations. The analysis spans from 1980 to 2020, except for Morocco, which covers the period from 1988 to 2020 due to data availability constraints. Data sources include the WB, the IMF, the United Nations (UN), the ILO, and national institutions.

The analysis employs two sets of variables: Dependent and independent variables. The dependent variables represent indicators of Dutch Disease symptoms, namely, the REER and the value-added shares of different economic sectors to GDP. The REER serves as an indicator of a country's export competitiveness relative to its trading partners, which tends to increase (appreciate) if the spending effect is present. Similarly, the sectoral value-added shares help identify shifts in the economic structure, particularly the anticipated decline in the tradeable sectors (manufacturing and agriculture) compared to growth in the non-tradeable sector (services) due to resource reallocation.

On the other hand, the independent variables, specifically the oil rents and workers' remittances, serve as the primary sources of foreign inflows into the countries. The oil rents, which measure the difference between the value of crude oil production at world prices and the total production costs, and they represent the main source of income for the oil-rich countries.

Conversely, workers' remittances capture the earnings sent back by nationals employed abroad, which is a critical income stream for the less resource-endowed countries (World Bank Database, 2023). Remittances sent by expatriate workers to their home countries represent a significant source of income for many MENA nations. While these inflows can alleviate poverty and boost household consumption (López-Calva & Lustig, 2010), they can also exert Dutch Disease effects by appreciating the real exchange rate. Such currency appreciation can lead to decreased competitiveness in export-oriented industries in global markets, which can ultimately negatively impact the economy's ability to diversify (Addison & Baliamoune, 2013).

In addition to the primary variables, control variables like the TOT, RIR, and TOP are also included to account for other influences on the dependent variables, enhancing the analysis by examining how external factors, monetary policy, and economic integration may interact with the REER and sectoral shifts.

The TOT, which is represented by the net barter terms of trade index, measures the percentage ratio of a unit of export's value to the unit value of import indexes, and it captures the external shocks that may affect the competitiveness and profitability of the tradeable sectors (World Bank Database, 2023). An increase in TOT implies that the country can purchase more imports with the same number of exports, making exports more valuable relative to imports, thereby improving the country's income and welfare. However, an increase in TOT could also lead to a rise in REER, as the surge in demand for domestic currency and the decrease in foreign currency supply could reduce the competitiveness of non-resource-tradeable sectors such as manufacturing and agriculture, resulting in a decrease in their value-added shares (Gasmi & Laourari, 2017). On the other hand, an increase in the TOT may also increase the value-added share of the resource sector, as higher export prices increase the sector's profitability and attractiveness, leading to its expansion. Thereby, the elasticity of demand and supply of exports and imports, along with the degree of substitution and complementarity between tradeable and non-tradeable goods, determines the TOT's net effect on the REER and sectoral value-added shares (Guedidi & Baghdadi, 2023). Mendoza (1995) has confirmed that TOT shocks exhibit significant magnitudes and are rarely procyclical. Lartey *et al.* (2012) affirmed that fluctuations in TOT appear to have distinct consequences for the real exchange rate; specifically, an increase in export prices compared to import prices results in a real exchange rate appreciation.

The RIR, which adjusts nominal interest rates for inflation, captures the monetary policy stance that may affect the REER and the sectoral value-added shares. When the RIR rises, borrowing becomes more expensive inside the country, and saving becomes more attractive, leading to multiple possible outcomes. On the one hand, a rise in the RIR might strengthen the REER by attracting foreign capital investments as investors seek higher returns. This influx of capital raises demand for domestic currency, potentially causing an appreciation. Consequently, the stronger currency can undermine the competitiveness of export-oriented industries, potentially leading to a reduction in their share of the overall economic output (Rodrik, 2008: 406). Conversely, a higher RIR might exert downward pressure on the REER, as the higher interest rate reduces the domestic demand for goods and services and increases the supply of domestic currency, as agents earn a higher return on saving and lending. This may increase the competitiveness of the tradeable sectors and cause an increase in their value-added shares (Kim & Roubini, 2000: 564). The net effect of these changes in supply and demand on the REER depends on how big and flexible the demand and supply curves are for domestic and foreign goods and services, as well as the domestic and foreign currency (Obstfeld & Rogoff, 1995: 645).

The TOP, measured as the ratio of exports and imports to GDP, reflects the degree of a country's integration into the global economy. Dornbusch (1974) and Balassa (1975) initially argued that trade liberalisation would lead to a depreciation of the REER. They suggested that reducing import tariffs would cause an imbalance in the current account due to increased demand for imports, which would subsequently require a depreciation of the real exchange rate. Edwards (2019), on the other hand, proposed that higher import tariffs increase the cost of imported goods, influencing the price of non-tradeable goods and services through two opposing channels: An income effect and a substitution effect. The overall impact on the real exchange rate depends on the strength and direction of these effects.

Table 7: Data Description

Symbol	Variables
REER	Real Effective Exchange Rate (2010=100)
MAN	Manufacturing Sector share % of GDP
AGR	Agriculture Sector share % of GDP
SER	Service Sector share % of GDP
OILRENTS	Oil Rents share % of GDP
TOT	Terms of Trade (2010=100)
RIR	Real Interest Rate
REM	Remittances share % of GDP
TOP	Trade Openness (sum of exports and imports of goods and services divided by GDP in current USD)

4.2. Research Methodology

This study employs the ARDL model as the primary estimation method to analyse the long-run dynamics of the relationships among the variables under investigation. The ARDL model, as introduced by Pesaran and Shin (1999) and extended by Pesaran *et al.* (2001), is particularly suitable for studies with variables that exhibit mixed orders of integration, i.e., I (0) and I (1), but excluding variables integrated of order I (2). Additionally, the inclusion of lagged values of the explanatory variables helps mitigate endogeneity concerns, as these lagged terms serve as instruments for the endogenous variables This flexibility makes it ideal for analysing macroeconomic relationships, where variables may exhibit different stationarity properties (Kripfganz & Schneider, 2023).

The ARDL model can be expressed mathematically as:

$$Y_t = \alpha_0 + \sum_{i=1}^{P} \beta_i Y_{t-i} + \sum_{j=0}^{q} \delta_j X_{t-j} + \varepsilon_t \tag{1}$$

where:

- Y_t : Dependent variable.
- X_t: Independent variables.
- α_0: Constant term.
- β_i, δ_j: Coefficients for the lagged dependent and independent variables, respectively.
- p, q: Optimal lag lengths for dependent and independent variables, respectively.
- ε_t: Error term.

The models specified for this study are based on the theoretical framework of Dutch Disease and the empirical literature on its effects on the REER and the value-added of different sectors of the economy. The study focuses on two groups of countries: Oil-rich (Algeria and Saudi Arabia) and oil-poor countries (Morocco and Tunisia). In this regard, two primary effects are tested:

- **Spending Effect:** Examines the impact of foreign exchange inflows (oil rents for oil-rich countries and workers' remittances for oil-poor countries) on the REER, which reflects the competitiveness of the domestic currency.
- **Resource Movement Effect:** Investigates how foreign exchange inflows affect the value-added shares of the manufacturing, agricultural, and services sectors, indicating economic diversification and structural changes.

4.2.1. ARDL Models Specification

For each country, the ARDL model is customised to analyse the long-term effects of oil rents and remittances on key economic indicators as follows:

Oil-Rich Countries: Algeria and Saudi Arabia

- **The Spending Effects:**

$$REER_t = \alpha_0 + \sum_{i=1}^{p} \beta_1 \, REER_{t-i} + \sum_{j=1}^{q} \beta_2 \, OILRENTS_{t-j} + \sum_{k=1}^{r} \beta_3 \, TOT_{t-K} + \sum_{l=1}^{s} \beta_4 \, RIR_{t-l} + \epsilon_t \qquad (2)$$

- **The Resources Movement Effects:**

$$MAN_t = \alpha_0 + \sum_{i=1}^{p} \beta_1 \, MAN_{t-i} + \sum_{j=1}^{q} \beta_2 \, OILRENTS_{t-j} + \sum_{k=1}^{r} \beta_3 \, TOT_{t-K} + \sum_{l=1}^{s} \beta_4 \, RIR_{t-l} + \epsilon_t \qquad (3)$$

$$AGR_t = \alpha_0 + \sum_{i=1}^{p} \beta_1 \, AGR_{t-i} + \sum_{j=1}^{q} \beta_2 \, OILRENTS_{t-j} + \sum_{k=1}^{r} \beta_3 \, TOT_{t-K} + \sum_{l=1}^{s} \beta_4 \, RIR_{t-l} + \epsilon_t \qquad (4)$$

$$SER_t = \alpha_0 + \sum_{i=1}^{p} \beta_1 \, SER_{t-i} + \sum_{j=1}^{q} \beta_2 \, OILRENTS_{t-j} + \sum_{k=1}^{r} \beta_3 \, TOT_{t-K} + \sum_{l=1}^{s} \beta_4 \, RIR_{t-l} + \epsilon_t \qquad (5)$$

Oil-Poor Countries: Morocco and Tunisia

- **The Spending Effects:**

$$REER_t = \alpha_0 + \sum_{i=1}^{p} \beta_1 \, REER_{t-i} + \sum_{j=1}^{q} \beta_2 \, REM_{t-j} + \sum_{k=1}^{r} \beta_3 \, TOT_{t-K} + \epsilon_t \qquad (6)$$

- **The Resources Movement Effects:**

$$MAN_t = \alpha_0 + \sum_{i=1}^{p} \beta_1 \, MAN_{t-i} + \sum_{j=1}^{q} \beta_2 \, REM_{t-j} + \sum_{k=1}^{r} \beta_3 \, TOT_{t-K} + \epsilon_t \qquad (7)$$

$$AGR_t = \alpha_0 + \sum_{i=1}^{p} \beta_1 \, AGR_{t-i} + \sum_{j=1}^{q} \beta_2 \, REM_{t-j} + \sum_{k=1}^{r} \beta_3 \, TOT_{t-K} + \epsilon_t \qquad (8)$$

$$SER_t = \alpha_0 + \sum_{i=1}^{p} \beta_1 \, SER_{t-i} + \sum_{j=1}^{q} \beta_2 \, REM_{t-j} + \sum_{k=1}^{r} \beta_3 \, TOT_{t-K} + \epsilon_t \qquad (9)$$

- In these models $REER_{t-i}$ refers to the past values of REER, lagged by i periods.
- $OILRENTS_{t-j}$, and REM_{t-j} refer to the past values of oil rents, and workers' remittances as a share of GDP, lagged by j periods.

- TOT_{t-k}, and RIR_{t-l} are the past values (lagged variables) of Terms of Trade, and Real Interest Rate, respectively, lagged by k and l periods.
- MAN_{t-i}, AGR_{t-i}, and SER_{t-i}, are the past values of the Manufacturing, Agricultural, and Services sector value-added shares of GDP, respectively, lagged by i periods.
- α_0 is the constant, β1, β2, β3, and β4 are the coefficients of the explanatory variables, and
- ε_t is the error term at time t.

4.2.2. Bounds Test

The key focus of this study is to test for the presence of a long-term equilibrium relationship between the dependent and independent variables. This is done using the Bounds testing approach, which examines whether variables are cointegrated in the long run.

The null and alternative hypotheses for the cointegration test are as follows:

- H_0: No long-term relationship exists ($\beta_1 = \beta_2 = \ldots = \beta_k = 0$).
- H_1: A long-term relationship exists ($\beta_1 \neq 0$, $\beta_2 \neq 0$, …,$\beta_k \neq 0$).

The calculated F-statistic from the Bounds test is compared with the critical values provided by Pesaran *et al.* (2001). If the F-statistic exceeds the upper bound critical value, the null hypothesis H_0 is rejected, indicating the presence of a long-term relationship among the variables. If the F-statistic is below the lower bound, it fails to reject H_0 (no cointegration). If the F-statistic is between Bounds, the result is inconclusive.

4.3. Empirical Results

4.3.1. Oil-Rich Countries

4.3.1.1. Algeria

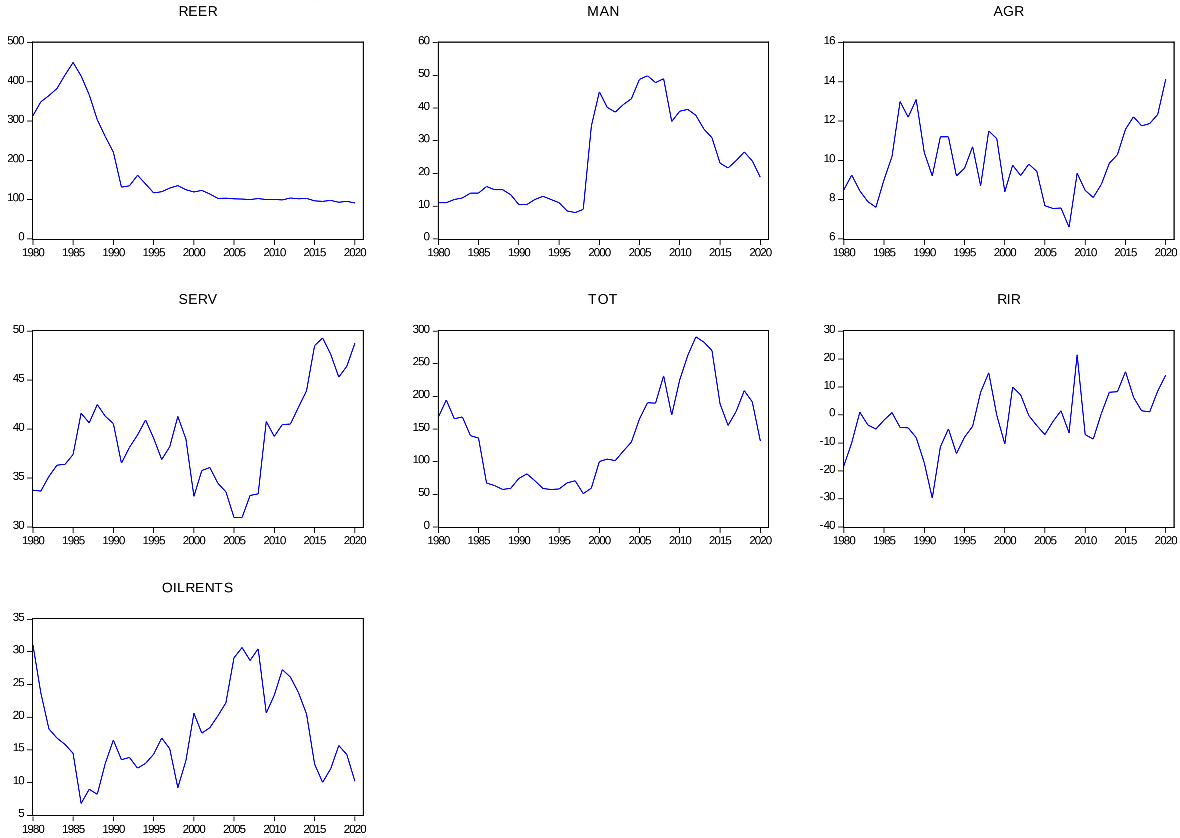
The first step of the analysis is to test the stationarity of the variables using the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) unit root tests. The results of these tests are reported in Table 8.

Table 8: Unit Root Test

	Augmented Dickey-Fuller Test					
	Level			First Differences		
Variables	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)
REER	-3.870127***	-5.047820***	-1.797936	-3.173282***	-3.751385***	-5.313729***
MAN	-0.476286	-1.390377	-0.944668	-4.781681***	-4.719346***	-4.780874***
AGR	0.305830	-2.092847	-1.305551	-5.408085***	-5.439218***	-5.432442***
SER	0.833719	-1.162052	-1.534765	-6.043991***	-6.116231**	-6.064243***
OILRENTS	-1.575102	-2.357362	-2.519454	-5.602325***	-5.563147***	-5.440556***
TOT	-0.783408	-1.363695	-1.785340	-5.358192***	-5.287253***	-5.229267***
RIR	-3.890521***	-3.800443***	-4.580871***	-6.986469***	-6.922425***	-6.815638***
	Phillips-Perron Test					
	Level			First Differences		
Variables	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)
REER	-1.493246	-1.249462	-1.589256	-3.489310***	-3.607131**	-3.591928**
MAN	-0.560690	-1.512576	-1.201230	-4.646033***	-4.572411***	-4.634326***
AGR	0.305830	-2.068227	-2.150969	-7.391259***	-7.383395***	-7.369449***
SER	0.949834	-1.130471	-1.516196	-6.038352***	-6.116719***	-6.083134***
OILRENTS	-1.559118	-2.472085	-2.620853	-5.650014***	-5.596021***	-5.441557***
TOT	-0.801278	-1.483358	-1.842981	-5.326209***	-5.255196***	-5.194286***
RIR	-3.896441***	-3.809324***	-4.564769***	-12.55038***	-21.19900***	-21.61902***

* Indicates significance at 10%; ** at 5%; *** at 1%

Figure 17: Time-Series Graphs of Variables



The outcomes of the stationarity tests, presented in Table 8, indicate that the variables exhibit a mixed order of integration. Specifically, REER, MAN, AGR, SER, OILRENTS, and TOT are found to be non-stationary at their levels but become stationary after taking their first differences, meaning they are integrated of order one, I (1). In contrast, RIR demonstrates stationarity at its level, indicating that it is integrated of order zero I (0). The plots of the variables, as shown in Figure 17, also support these findings. REER, MAN, AGR, SER, OIL RENTS, and TOT exhibit a clear trend, either upward or downward, and a varying variance over time, indicating that they are non-stationary at their levels. However, RIR shows no apparent trend and has a constant variance over time, indicating that it is stationary at its level.

4.3.1.1.1. The Spending Effects of Oil Rents

This study examines the impact of oil rents on Algeria's REER, taking into account the country's status as a significant oil exporter both in Africa and globally. The influx of oil rents can contribute to the REER's appreciation through the spending effect, as described by Corden and Neary (1982). This effect arises when increased oil income leads to higher domestic demand for non-tradeable goods and services compared to tradeable ones, resulting in upward pressure on the REER. The model expresses the relationship between the REER, oil rents as a percentage of GDP, TOT, and RIR.

Table 9: ARDL Regression Test

a) **Trend Specification:** Restricted Constant and No Trend (case 2)/ Constant (case 3)[2]

Variable	Coefficient	Std. Error	t-Statistic	P-value
REER (-1)	1.588303	0.130343	12.18555	0.0000
REER (-2)	-0.626256	0.137091	-4.568187	0.0001
OILRENTS	3.564841	1.540176	2.314567	0.0282
OILRENTS (-1)	-4.399605	1.809354	-2.431589	0.0217
OILRENTS (-2)	1.444684	1.088163	1.327636	0.1950
TOT	0.092266	0.193067	0.477894	0.6364
TOT (-1)	-0.374541	0.259014	-1.446022	0.1593
TOT (-2)	0.318549	0.184773	1.724000	0.0957
RIR	1.994941	0.482472	4.134833	0.0003
RIR (-1)	-2.166265	0.502750	-4.308831	0.0002
C	-12.87030	14.00838	-0.918757	0.3661
Selected Model: ARDL (2, 2, 2, 1)				

[2] Trend specification: Restricted Constant and No Trend (case 2) / Constant (case 3) are combined in the same table since they give the same results.

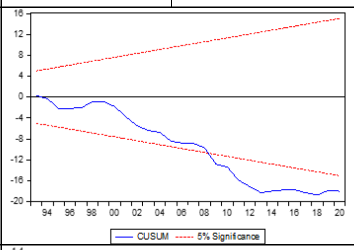
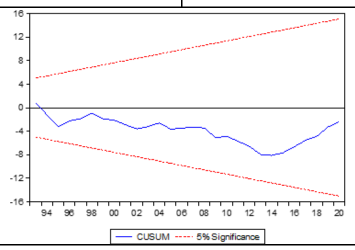
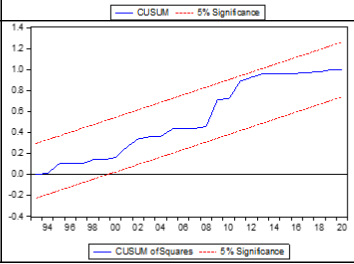
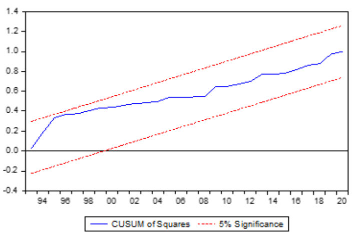
Table 9: Continue

b) Trend Specification: Unrestricted Constant and Restricted Trend (case 4)/ Unrestricted Constant and Unrestricted Trend (case 5)[3]

Variable	Coefficient	Std. Error	t-Statistic	P-value
REER (-1)	1.329120	0.132669	10.01832	0.0000
REER (-2)	-0.540468	0.118659	-4.554798	0.0001
OILRENTS	3.662464	1.302742	2.811350	0.0089
OILRENTS (-1)	-4.529050	1.269769	-3.566830	0.0013
TOT	0.131458	0.163586	0.803600	0.4284
TOT (-1)	-0.199221	0.221187	-0.900691	0.3754
TOT (-2)	0.370468	0.127672	2.901723	0.0072
RIR	2.146848	0.410463	5.230306	0.0000
RIR (-1)	-1.470370	0.458465	-3.207160	0.0033
C	62.78703	24.45140	2.567830	0.0159
@TREND	-2.632219	0.713686	-3.688202	0.0010
Selected Model: ARDL (2, 1, 2, 1)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis. This involves performing the normality test to check the distribution of residuals, the serial correlation LM test to ensure the independence of residuals, and the heteroskedasticity test to verify the consistency of variance in residuals. Additionally, the CUSUM and CUSUM of Squares tests are carried out to confirm the stability of the model. These diagnostic checks are essential for validating the assumptions of the model and ensuring the reliability of the results.

Table 10: Diagnostic Test of Residuals

<table>
<tr><th>Test</th><th>Case 2</th><th>Case 3</th><th>Case 4</th><th>Case 5</th><th>Observations</th></tr>
<tr><td>Normality Test</td><td>0.267154</td><td>0.267154</td><td>0.879176</td><td>0.879176</td><td>Residuals are normally distributed</td></tr>
<tr><td>Serial Correlation LM Test</td><td>0.0538</td><td>0.0538</td><td>0.0962</td><td>0.0962</td><td>No serial correlation is detected</td></tr>
<tr><td>Heteroskedasticity Test</td><td>0.2709</td><td>0.2709</td><td>0.4548</td><td>0.4548</td><td>Residuals don’t show heteroscedasticity</td></tr>
<tr><td>CUSUM Test</td><td colspan="2">
</td><td colspan="2">
</td><td>The model indicates stability</td></tr>
<tr><td>CUSUM of Squares Test</td><td colspan="2">
</td><td colspan="2">
</td><td>The model indicates structural stability</td></tr>
</table>

[3] Trend specification: Unrestricted Constant and Restricted Trend (case 4) / Unrestricted Constant and Unrestricted Trend (case 5) are combined in the same table since they give the same results.

The analysis presents several important findings regarding the model. The Jacque-Bera test exhibits normality p-values above the 5% threshold, which validates the null hypothesis and confirms the normal distribution of the residuals in all cases. The Lagrange Multiplier (LM) test results also show p-values exceeding 5%, indicating that the model is free from autocorrelation, thus confirming the residuals' independence. Furthermore, the study used the Breusch-Pagan-Godfrey test for heteroskedasticity, and the results showed p-values above 5% in all cases, which supported the null hypothesis of homoscedasticity and demonstrated no signs of heteroskedasticity. The parameter stability analysis also showed that the CUSUM and CUSUM of Squares tests did not reject the null hypothesis of stability at a 5% significance level since the statistics remained within the critical Bounds. However, in cases 2 and 3, the CUSUM statistic exceeded the lower bound, indicating the rejection of the parameter stability hypothesis.

Table 11: Bounds Test

	Critical Value							
Significance level	**Case 2**		**Case 3**		**Case 4**		**Case 5**	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	3.65	4.66	4.29	5.61	4.3	5.23	5.17	6.36
5%	2.79	3.67	3.23	4.35	3.38	4.23	4.01	5.07
10%	2.37	3.2	2.72	3.77	2.97	3.74	3.47	4.45
F-Statistic	1.507421		1.418547		4.735020		5.454205	

Table 11 shows the results of the Bounds test and reveals that for the cases 2, and 3, the F-statistics (1.507421) and (1.418547) fall below the lower bound I (0) at the 10% significance level. This suggests the absence of cointegration between the variables. On the other hand, for the cases 4, and 5, the F-statistics (4.735020) and (5.454205) are higher than the upper bound I (1) at the 5% significance level. This leads to the rejection of the null hypothesis, stating that there is no cointegration relationship in the model, and accepting the alternative hypothesis that a cointegrating long-run relationship in the model does exist. Therefore, it is concluded that there is a long-run relationship between the variables for the restricted trend and constant and trend specifications, but not for the restricted constant and constant specifications.

Based on the results presented, the cases 4 and 5 are considered the most suitable, demonstrating the best stability of residuals. In addition to that, these cases also exhibited a significant trend coefficient in the ARDL regression test in table 9. Given these outcomes, and considering the Bounds test indicating a cointegrating long-term relationship within the model for cases 4 and 5, it is deemed appropriate to further investigate the long-term relationship for these specifications.

Table 12: Long Run Relationship Estimation

	Variable	Coefficient	Std. Error	t-Statistic	P-value
Case 4	OILRENTS	-4.100290	3.271708	-1.253257	0.2205
	TOT	1.432259***	0.287945	4.974063	0.0000
	RIR	3.200784	2.235763	1.431630	0.1633
	@TREND	-12.45445	1.624355	-7.667321	0.0000
	EC = REER - (-4.1003*OILRENTS + 1.4323*TOT + 3.2008*RIR -12.4545*@TREND				
Case 5	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
	OILRENTS	-4.100290	3.271708	-1.253257	0.2205
	TOT	1.432259***	0.287945	4.974063	0.0000
	RIR	3.200784	2.235763	1.431630	0.1633
	EC = REER - (-4.1003*OILRENTS + 1.4323*TOT + 3.2008*RIR)				

* Indicates significance at 10%; ** at 5%; *** at 1%

The results of the long-run estimation in Table 12 reveal that oil rents have an insignificant long-term impact on the REER. This finding confirms the results of the other trend specifications (cases 2 and 3), indicating that there are no emerging spending effect risks associated with oil rents. The results align with previous studies such as Gasmi and Laourari (2017), which conducted an in-depth study to explore the presence of Dutch Disease in Algeria and aimed to capture the spending effects by examining the impact of real oil prices on the real effective exchange rate in Algeria. Their findings have revealed that the variables do not share a cointegrating relationship in the long run, suggesting that Algeria is not at risk of Dutch Disease.

TOT exhibits a significant positive impact on the REER in the long run. Specifically, an increase in the TOT by one unit leads to an appreciation in the REER by 1.43 unit in the long run. Conversely, RIR is found to be insignificant in the long run.

4.3.1.1.2. The Resource Movement Effects of Oil Rents

a) The Impact on the Manufacturing Sector

This section of the study investigates how oil rents affect the distribution of value-added shares across different sectors in Algeria. As outlined by Corden and Neary (1982), the emergence of a booming extractive sector, such as oil, can trigger shifts in the economy's sectoral composition. The inflow of substantial oil rents often results in a reduction in the value-added shares of sectors like agriculture and manufacturing, a phenomenon attributed to the "Resource Movement Effect." In this effect, resources, including labour and capital, are drawn away from traditional sectors towards the more lucrative oil sector and its ancillary industries. Consequently, while the manufacturing and agricultural sectors may experience contraction, the services sector often expands its value-added share. To empirically analyse this dynamic, the study employs the

ARDL model to capture the relationship between the manufacturing sector's value-added share and key explanatory variables: Oil rents share of GDP, TOT, and RIR.

Table 13: ARDL Regression Test

a) Trend Specification: Case 2/ Case 3

Variable	Coefficient	Std. Error	t-Statistic	P-value
MAN (-1)	1.140108	0.141006	8.085539	0.0000
MAN (-2)	-0.426794	0.131190	-3.253252	0.0027
OILRENTS	0.593471	0.212467	2.793235	0.0087
TOT	-0.018299	0.013729	-1.332821	0.1920
RIR	-0.167872	0.085520	-1.962959	0.0584
RIR (-1)	0.416296	0.080642	5.162251	0.0000
C	0.073462	1.896258	0.038741	0.9693
Selected Model: ARDL (2, 0, 0, 1)				

b) Trend Specification: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
MAN (-1)	1.203954	0.161463	7.456523	0.0000
MAN (-2)	-0.435619	0.155961	-2.793133	0.0095
OILRENTS	0.479644	0.409285	1.171909	0.2515
OILRENTS (-1)	-0.810937	0.444348	-1.825003	0.0791
OILRENTS (-2)	0.685302	0.302894	2.262512	0.0319
TOT	0.002525	0.046786	0.053975	0.9574
TOT (-1)	0.049876	0.061782	0.807291	0.4266
TOT (-2)	-0.083210	0.044663	-1.863093	0.0734
RIR	-0.173274	0.119004	-1.456032	0.1569
RIR (-1)	0.353158	0.114669	3.079791	0.0047
C	1.992061	3.423430	0.581890	0.5655
@TREND	0.105187	0.109031	0.964740	0.3432
Selected Model: ARDL (2, 2, 2, 1)				

After the ARDL estimation and before moving to the Bounds test, it is strictly necessary to perform the residuals diagnosis.

Table 14: Diagnostic Test of Residuals

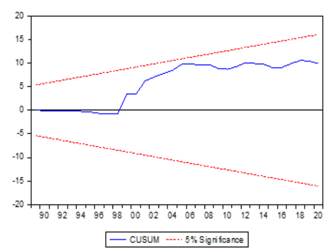
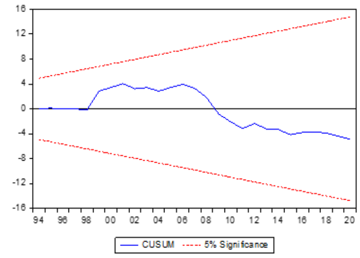
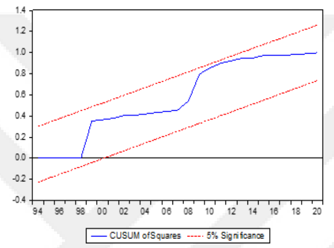
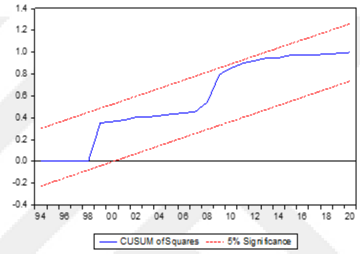
Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.000000	0.000000	0.000023	0.000023	Residuals are not normally distributed
Serial Correlation LM Test	0.4167	0.4167	0.3969	0.3969	No serial correlation is detected
Heteroskedasticity Test	0.1779	0.1779	0.1892	0.1892	Residuals don't show heteroscedasticity
CUSUM Test					The model indicates stability
CUSUM of Squares Test					The model indicates structural stability

Table 15: Bounds Test

	Critical Value							
Significance level	**Case 2**		**Case 3**		**Case 4**		**Case 5**	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	3.65	4.66	4.29	5.61	4.3	5.23	5.17	6.36
5%	2.79	3.67	3.23	4.35	3.38	4.23	4.01	5.07
10%	2.37	3.2	2.72	3.77	2.97	3.74	3.47	4.45
F-Statistic	2.587451		3.183157		2.330241		2.739863	

The Bounds test results in Table 15 demonstrate that the F-statistic values for both cases 2 and 3 (2.587451 and 3.183157, respectively) fall within the critical value range for the lower bound I (0) and the upper bound I (1) at a 10% significance level. This suggests that the results are inconclusive for these cases, as the test does not definitively confirm or reject the existence of a cointegration relationship in the model. In contrast, for cases 4 and 5, the F-statistic values (2.330241 and 2.739863, respectively) are below the critical value for the lower bound I (0) at a 10% significance level. This indicates that there is no cointegration relationship in the model for these cases. Therefore, based on these findings, there is no need to estimate the coefficients of the long-run relationship for these trend specifications.

Table 16: Long-Run Relationship Estimation

	Variable	Coefficient	Std. Error	t-Statistic	P-value
Case 2	OILRENTS	2.070110***	0.530781	3.900122	0.0005
	TOT	-0.063828	0.052925	-1.206008	0.2367
	RIR	0.866540	0.318116	2.723980	0.0104
	C	0.256246	6.631797	0.038639	0.9694
	EC = MAN - (2.0701*OILRENTS -0.0638*TOT + 0.8665*RIR + 0.2562)				
Case 3	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
	OILRENTS	2.070110***	0.530781	3.900122	0.0005
	TOT	-0.063828	0.052925	-1.206008	0.2367
	RIR	0.866540	0.318116	2.723980	0.0104
	EC = MAN - (2.0701*OILRENTS -0.0638*TOT + 0.8665*RIR)				

* Indicates significance at 10%; ** at 5%; *** at 1%

The outcomes of the Bounds test in table 15 suggest the outcomes indicate that the results are inconclusive for cases 2 and 3, however, it indicated an absence of a long-term relationship within the model in cases 4 and 5. This can be interpreted as an indication that oil revenues do not significantly impact the manufacturing sector in Algeria over a long period. This finding contradicts the hypothesis that substantial oil revenues trigger resource movements from the tradeable sector to the booming sector, specifically the oil sector. However, the findings are also consistent with previous research, which concluded that higher oil rents may not affect or even promote growth in domestic companies. This is particularly true for firms with monopolistic price-setting power, which allows them to benefit from the oil rent boom, which can strengthen their growth and market position (Shakeri, 2009; Sierra & Manrique, 2014).

b) The Impact on the Agricultural Sector

This section of the study employs the ARDL model to analyse the relationship between the sectoral value-added share of the agricultural sector and the oil rents share of GDP, TOT, and RIR in Algeria.

Table 17: ARDL Regression Test

a) Trend Specification: Case 2/ Case 3

Variable	Coefficient	Std. Error	t-Statistic	P-value
AGR (-1)	0.495344	0.138492	3.576693	0.0011
OILRENTS	-0.108057	0.050695	-2.131494	0.0406
OILRENTS (-1)	-0.070181	0.060867	-1.153032	0.2572
TOT	0.005399	0.003393	1.591206	0.1211
RIR	0.072118	0.022253	3.240895	0.0027
RIR (-1)	-0.036839	0.020360	-1.809413	0.0795
C	7.497248	1.861717	4.027061	0.0003
Selected Model: ARDL (1, 1, 0, 1)				

b) Trend Specification: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
AGR (-1)	0.401627	0.150121	2.675349	0.0117
OILRENTS	-0.139505	0.054164	-2.575607	0.0148
OILRENTS (-1)	-0.050477	0.061271	-0.823829	0.4161
TOT	0.002794	0.003771	0.740846	0.4642
RIR	0.051159	0.026060	1.963122	0.0584
RIR (-1)	-0.039438	0.020081	-1.963957	0.0583
C	8.269705	1.902385	4.347019	0.0001
@TREND	0.033101	0.022396	1.477961	0.1492
Selected Model: ARDL (1, 1, 0, 1)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis.

Table 18: Diagnostic Test of Residuals

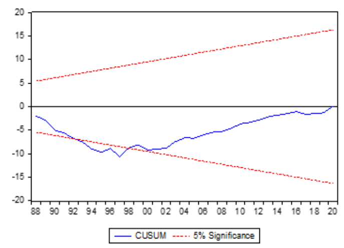
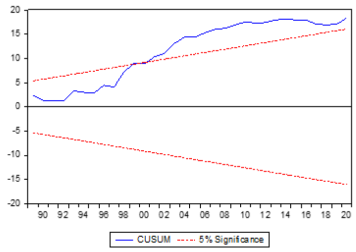
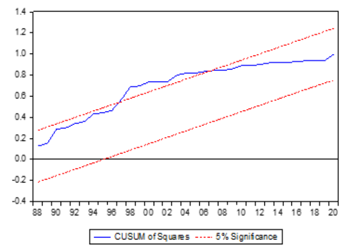
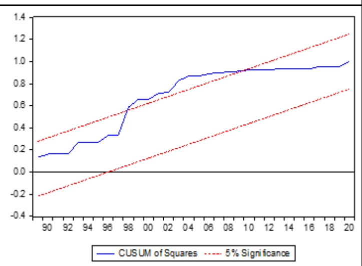
Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.566961	0.566961	0.323671	0.323671	Residuals are normally distributed
Serial Corelation LM Test	0.4326	0.4326	0.2777	0.2777	No serial correlation is detected
Heteroskedasticity Test	0.5907	0.5907	0.1866	0.1866	Residuals don't show heteroscedasticity
CUSUM Test					The model indicates instability in cases 2, 3, 4 and 5
CUSUM of Squares Test					The model indicates structural instability in cases 2, 3, 4 and 5

Table 19: Bounds Test

Significance level	Critical Value							
	Case 2		Case 3		Case 4		Case 5	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	3.65	4.66	4.29	5.61	4.3	5.23	5.17	6.36
5%	2.79	3.67	3.23	4.35	3.38	4.23	4.01	5.07
10%	2.37	3.2	2.72	3.77	2.97	3.74	3.47	4.45
F-Statistic	4.416846		5.496448		4.991846		5.962887	

Table 19 presents the results of the Bounds test, indicating that the F-statistic values (4.416846), (5.496448), (4.991846), and (5.962887) exceed the upper bound I (1) at the 5% significance level in each case. This results in the rejection of the null hypothesis, which posits the absence of a cointegration relationship in the model, and the acceptance of the alternative hypothesis, affirming the existence of a cointegrating long-run connection within the model.

Based on the results presented above, the cases 2 and 3 are considered the most suitable, since the cases 4, and 5 exhibited an insignificant trend coefficient in the ARDL regression test in Table 17. Given these outcomes, and considering the Bounds test indicating a cointegrating long-term relationship within the model for cases 2 and 3, it is deemed appropriate to further investigate the long-term relationship for these specifications.

Table 20: The Long Run Relationship Estimation

	Variable	Coefficient	Std. Error	t-Statistic	P-value
Case 2	OILRENTS	-0.353188***	0.082794	-4.265852	0.0002
	TOT	0.010699	0.006733	1.589057	0.1216
	RIR	0.069908	0.044238	1.580269	0.1236
	C	14.85617	1.039505	14.29157	0.0000
	EC = AGR - (-0.3532*OILRENTS + 0.0107*TOT + 0.0699*RIR + 14.8562)				
Case 3	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
	OILRENTS	-0.353188***	0.082794	-4.265852	0.0002
	TOT	0.010699	0.006733	1.589057	0.1216
	RIR	0.069908	0.044238	1.580269	0.1236
	EC = AGR - (-0.3532*OILRENTS + 0.0107*TOT + 0.0699*RIR)				

* Indicates significance at 10%; ** at 5%; *** at 1%

The long-run relationship results indicated in Table 20 demonstrates that OILRENTS has a significant adverse effect (-0.353) on the agricultural sector in cases 2 and 3, which means a 1 unit increase in OILRENTS results in a long-term drop of 0.353 unit in the agricultural value-added share of GDP. The findings align with the research hypothesis and the theory of Dutch Disease, which asserts that an increase in oil rents may lead to a prolonged decrease in the agricultural sector, a phenomenon known as de-agriculturalisation. This mechanism is seen as a channel for the spread of Dutch Disease in Algeria. In contrast, the TOT and RIR seem to exert no substantial influence in the long term. This indicates that the control variables in the model do not significantly affect the agricultural value-added share of GDP in the long term in Algeria, highlighting the dominant significance of oil rents in determining the sectoral composition of the economy.

c) The Impact on Services Sector

This section of the study employs the ARDL model to analyse the relationship between the sectoral value-added share of the services sector and the oil rents share of GDP, TOT, and RIR in Algeria.

Table 21: ARDL Regression Test

a) Trend Specification: Case 2/ Case 3

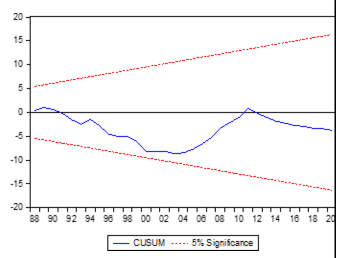
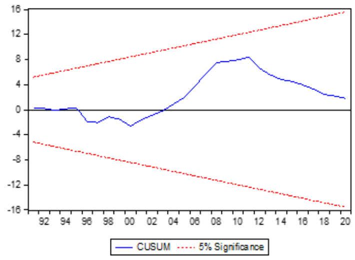
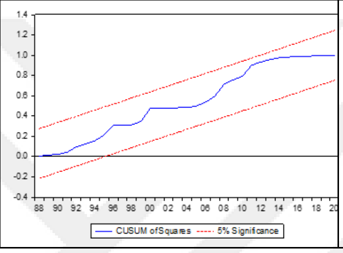
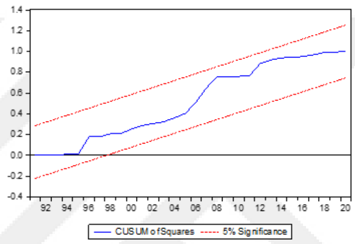
Variable	Coefficient	Std. Error	t-Statistic	P-value
SERV (-1)	0.798449	0.099003	8.064929	0.0000
OILRENTS	-0.239563	0.105663	-2.267249	0.0301
OILRENTS (-1)	0.139507	0.104043	1.340859	0.1891
TOT	-0.018743	0.014948	-1.253838	0.2187
TOT (-1)	0.028803	0.013506	2.132661	0.0405
RIR	0.067385	0.027900	2.415214	0.0214
C	8.522488	4.743047	1.796838	0.0815
Selected Model: ARDL (1, 1, 1, 0)				

b) Trend Specification: Case 4 / Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
SERV (-1)	0.780740	0.174438	4.475736	0.0001
SERV (-2)	-0.211062	0.134408	-1.570303	0.1268
OILRENTS	-0.317619	0.130479	-2.434254	0.0211
TOT	-0.007379	0.015747	-0.468586	0.6428
TOT (-1)	0.024993	0.012564	1.989245	0.0559
RIR	0.073598	0.042761	1.721161	0.0955
RIR (-1)	-0.085927	0.039884	-2.154419	0.0394
C	18.34479	6.169253	2.973584	0.0058
@TREND	0.081367	0.047442	1.715082	0.1042
Selected Model: ARDL (2, 0, 1, 1)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis.

Table 22: Diagnostic Test of Residuals

Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.514586	0.514586	0.068082	0.068082	Residuals are normally distributed
Serial Correlation LM Test	0.0824	0.0824	0.6400	0.6400	No serial correlation is detected
Heteroskedasticity Test	0.1457	0.1457	0.0311	0.0311	Heteroscedasticity in cases 4 and 5
CUSUM Test					The model indicates stability
CUSUM of Squares Test					The model indicates structural stability

The Breusch-Pagan-Godfrey test for heteroskedasticity showed a p-value lower than 5%, indicating that residuals suffer from heteroskedasticity in cases 4 and 5, therefore, the HAC (Newey-West) estimator is employed to account for potential heteroskedasticity in the ARDL model.

Table 23: The Bounds Test

	Critical Value							
Significance level	**Case 2**		**Case 3**		**Case 4**		**Case 5**	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	3.65	4.66	4.29	5.61	4.3	5.23	5.17	6.36
5%	2.79	3.67	3.23	4.35	3.38	4.23	4.01	5.07
10%	2.37	3.2	2.72	3.77	2.97	3.74	3.47	4.45
F-Statistic	3.326152		3.971258		3.560679		4.263651	

Table 23 presents the outcomes of the Bounds test, indicating that the F-statistics values of 3.326152 and 3.971258 for cases 2 and 3, respectively, exceed the critical value for the upper bound I (1) at the 10% significance level. This allows the rejection of the null hypothesis of no cointegration, thus confirming the existence of a cointegrating long-run relationship among the variables in these two cases. In contrast, for cases 4 and 5, the F-statistic values of 3.560679 and 4.26351 fall between the lower bound I (0) and upper bound I (1) critical values. This placement within the critical value range renders the results inconclusive, as they neither definitively confirm nor reject the presence of a cointegration relationship within the model for these cases. This implies that the results are inconclusive in these cases since they do not provide definitive evidence to confirm or reject the presence of a cointegration relationship in the model in these cases.

Based on the results discussed earlier, cases 2 and 3 emerge as the most appropriate models, given that cases 4 and 5 displayed an insignificant trend coefficient in the ARDL regression results presented in Table 21. Moreover, the Bounds test results further support this choice by confirming a cointegrating long-term relationship for cases 2 and 3 in Table 23. Consequently, these findings justify proceeding with the investigation of the long-term relationships for these specifications.

Table 24: Long Run Relationship Estimation

	Variable	Coefficient	Std. Error	t-Statistic	P-value
Case 2	OILRENTS	-0.496430	0.342784	-1.448232	0.1570
	TOT	0.049912**	0.022127	2.255733	0.0308
	RIR	0.334331	0.211407	1.581452	0.1233
	C	42.28447	4.547693	9.298005	0.0000
	EC = SERV - (-0.4964*OILRENTS + 0.0499*TOT + 0.3343*RIR + 42.2845)				
Case 3	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
	OILRENTS	-0.496430	0.342784	-1.448232	0.1570
	TOT	0.049912**	0.022127	2.255733	0.0308
	RIR	0.334331	0.211407	1.581452	0.1233
	EC = SERV - (-0.4964*OILRENTS + 0.0499*TOT + 0.3343*RIR)				

* Indicates significance at 10%; ** at 5%; *** at 1%

The results of the Bounds test, as presented in Table 23, reveal mixed outcomes across the different cases. Specifically, the results are inconclusive for Cases 4 and 5, as the F-statistic falls between the critical values, making it unclear whether a long-term relationship exists. However, in Cases 2 and 3, the Bounds test confirms the presence of a significant long-term relationship within the model.

The long-run estimation results indicate that OILRENTS do not have a statistically significant impact on the services sector in the long run, suggesting that there is no evident resource movement effect associated with oil rents in Algeria over the long term. This finding challenges the hypothesis that oil rents would drive an expansion in the services sector at the expense of other tradeable sectors. Moreover, TOT exhibits a significant positive impact on the services sector's share of GDP in the long run, with a coefficient of 0.049. This implies that a 1 unit increase in the TOT is associated with a 0.049 unit increase in the share of services in the GDP over the long run. On the other hand, the RIR appears to have no significant long-term effect on the services sector.

4.3.1.2. Saudi Arabia

This part of the study explores the presence of Dutch Disease in Saudi Arabia, focussing especially on the potential presence of spending and resource allocation effects, which are mainly driven by oil rents. To ensure a thorough understanding of the factors influencing economic dynamics, the analysis employs oil rents as the explanatory variable, as well as some control variables. However, due to data limitations specific to Saudi Arabia, adjustments are made to the model: The RIR is excluded, and the TOT is substituted with TOP. TOP serves as a practical alternative in this context, capturing Saudi Arabia's degree of integration with the global economy and offering insights into how international trade flows might influence domestic resource allocation and spending behaviour.

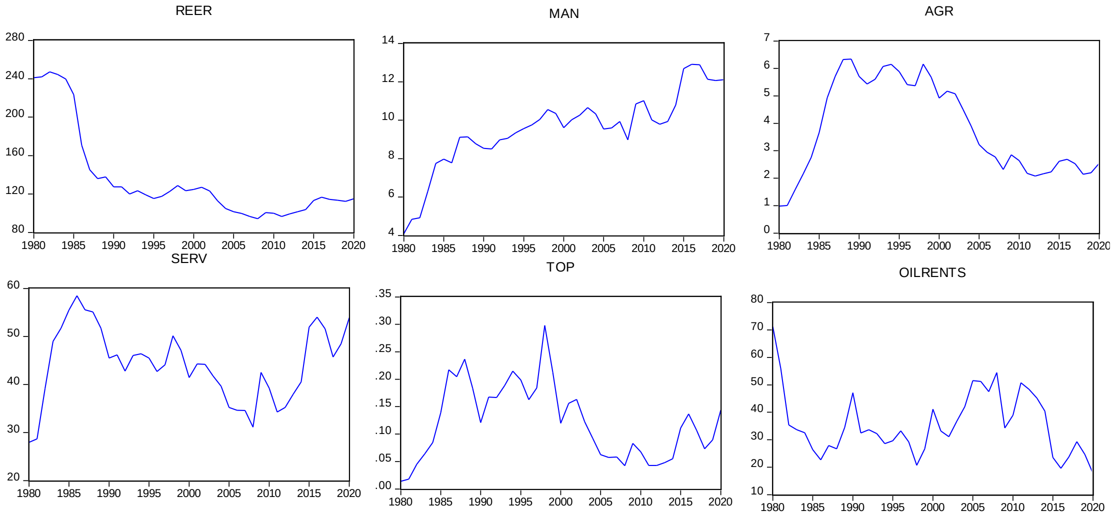
The analysis begins by assessing the variables stationarity using the ADF and PP Unit Root tests. Table 25 provides the results of these tests.

Table 25: Unit Root Test

	Augmented Dickey-Fuller Test					
	Level			First Differences		
Variables	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)
REER	-2.763650***	-2.736644	-1.215462	-3.163068***	-3.310544**	-3.779456**
MAN	1.297304	-2.680016	-3.176669	-5.319372***	-5.587813***	-5.645112***
AGR	-0.437950	-1.556079	-2.786847	-3.382137***	-3.400634**	-3.636993**
SER	0.484083	-2.426785	-2.498131	-4.912278***	-4.932537***	-4.868812***
OILRENTS	-1.944390*	-3.569353**	-3.491754*	-6.134835***	-6.094430***	-5.906234***
TOP	-0.378961	-1.893241	-2.590666	-6.006355***	-5.956300***	-5.960840***
	Phillips-Perron Test					
	Level			First Differences		
Variables	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)
REER	-2.206702**	-2.736644	-1.377121	-3.139936***	-3.275143**	-3.438794*
MAN	1.249112	-2.854713	-3.154599	-5.277811***	-5.623360***	-5.714957***
AGR	-0.411842	-1.785900	-2.786847	-3.382137***	-3.356954**	-3.769151**
SER	0.386658	-2.582942	-2.624291	-4.921834***	-4.946847***	-4.868812***
OILRENTS	-1.923294*	-3.644766***	-3.564943**	-5.966189***	-5.950525***	-5.803947***
TOP	-0.551415	-2.417391	-2.530727	-5.582398***	-5.530177***	-5.470396***

* Indicates significance at 10%; ** at 5%; *** at 1%

Figure 18: Time-Series Graphs of Variables



The outcomes of the stationarity tests, as outlined in Table 25, demonstrate that the variables have a mixed integration order. REER, MAN, AGR, SER, and TOP are non-stationary in their original levels but achieve stationarity after first differencing, indicating they are integrated of order one I (1). In contrast, OILRENTS is stationary at its level, suggesting that it is integrated of order zero I (0). The plots of the variables, as shown in Figure 18, also support these findings. REER, MAN, AGR, SER, and TOP show a clear trend, either upward or downward, with varying variance over time, indicating that they are non-stationary at their levels. However, OILRENTS shows no apparent trend and has a constant variance over time, indicating that it is stationary at its level.

4.3.1.2.1. The Spending Effects of Oil Rents

In this part of the study, the ARDL model is used to analyse the relationship between REER, the oil rents share of GDP, and TOP in Saudi Arabia as follows:

Table 26: ARDL Regression Test

a) Trend Specification: Case 2/ Case 3

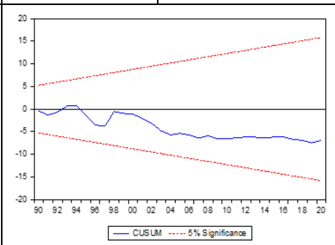
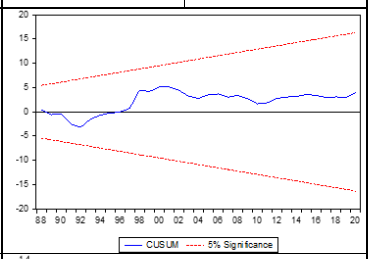
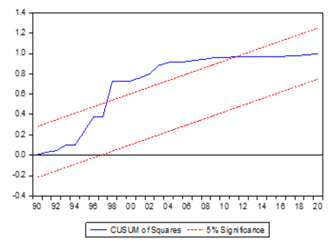
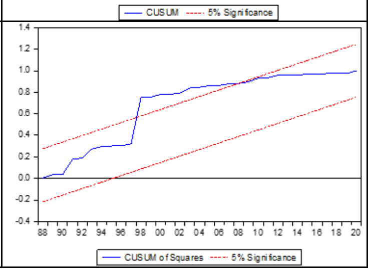
Variable	Coefficient	Std. Error	t-Statistic	P-value
REER (-1)	1.298959	0.148276	8.760386	0.0000
REER (-2)	-0.380635	0.122655	-3.103300	0.0041
OILRENTS	-0.746779	0.324603	-2.300592	0.0283
OILRENTS (-1)	0.657339	0.276666	2.375928	0.0239
TOP	-101.5296	92.53304	-1.097225	0.2810
TOP (-1)	44.60465	80.06537	0.557103	0.5815
TOP (-2)	50.81000	19.79177	2.567228	0.0153
C	12.43546	6.844054	1.816973	0.0789
Selected Model: ARDL (2, 1, 2)				

b) Trend Specification: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
REER (-1)	1.081647	0.207028	5.224645	0.0000
REER (-2)	-0.426989	0.118865	-3.592230	0.0011
OILRENTS	-1.038312	0.491062	-2.114421	0.0421
TOP	-186.9324	104.6299	-1.786607	0.0832
C	127.6213	61.28335	2.082479	0.0451
@TREND	-1.155057	0.608175	-1.899219	0.0663
Selected Model: ARDL (2, 0, 0)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis.

Table 27: Diagnostic Test of Residuals

Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.000000	0.000000	0.000000	0.000000	Residuals are not normally distributed
Serial Correlation LM Test	0.3101	0.3101	0.7870	0.7870	No serial correlation is detected
Heteroskedasticity Test	0.0585	0.0585	0.0082	0.0082	Heteroscedasticity in cases 4 and 5
CUSUM Test					The model indicates stability
CUSUM of Squares Test					The model indicates structural instability in cases 2, 3, 4 and 5

The Breusch-Pagan-Godfrey test for heteroskedasticity showed a p-value lower than 5%, indicating that residuals suffer from heteroskedasticity in cases 4 and 5, therefore, the HAC

(Newey-West) estimator is employed to account for potential heteroskedasticity in the ARDL model.

Table 28: The Bounds Test

Significance level	Critical Value							
	Case 2		Case 3		Case 4		Case 5	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	4.13	5	5.15	6.36	4.99	5.85	6.34	7.52
5%	3.1	3.87	3.79	4.85	3.88	4.61	4.87	5.85
10%	2.63	3.35	3.17	4.14	3.38	4.02	4.19	5.06
F-Statistic	2.355435		2.384797		6.216488		6.860834	

Table 28 displays the results of the Bounds test, indicating that the F-statistics values (2.355435) and (2.384797) for cases 2 and 3 fall below the critical value for the lower bound I (0) at the 10% significance level. This outcome suggests that there is no cointegration relationship in the model for these cases. In contrast, the F-statistic values for cases 4 and 5 (6.216488 and 6.860834, respectively) exceed the critical upper bound I (1) at a 5% significance level. This allows us to reject the null hypothesis that posits the absence of a cointegration relationship in the model, confirming the existence of a long-term equilibrium relationship between the variables for these trend specifications. Therefore, it can be concluded that a cointegrating long-run relationship is present in cases 4 and 5, highlighting the interconnectedness of the variables over the long run in the context of Saudi Arabia's economic dynamics.

Based on the results outlined above, cases 4 and 5 are identified as the most suitable specifications, as they exhibited a significant trend coefficient at the 10% significance level in the ARDL regression test reported in Table 26. Furthermore, the Bounds test confirmed the existence of a cointegrating long-term relationship within the model for these cases. Consequently, it is appropriate to proceed with the investigation of the long-term relationship for cases 4 and 5 to gain a deeper understanding of the dynamics at play in Saudi Arabia's economic context.

Table 29: Long Run Relationship Estimation

	Variable	Coefficient	Std. Error	t-Statistic	P-value
Case 4	OILRENTS	-3.006618***	0.483222	-6.222018	0.0000
	TOP	-541.2965***	79.32855	-6.823476	0.0000
	@TREND	-3.344676	0.380158	-8.798124	0.0000
	EC = REER - (-3.0066*OILRENTS -541.2965*TOP -3.3447*@TREND)				
Case 5	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
	OILRENTS	-3.006618***	0.483222	-6.222018	0.0000
	TOP	-541.2965***	79.32855	-6.823476	0.0000
	EC = REER - (-3.0066*OILRENTS -541.2965*TOP)				

* Indicates significance at 10%; ** at 5%; *** at 1%

For the trend specifications investigated in Table 29, the findings reveal a substantial negative impact (-3.0) of OILRENTS on the REER. This implies that a unit increase in oil revenues triggers a depreciation in the REER by 3 units over the long term. Furthermore, TOP exerts a significant negative influence on the REER in the long term, as a unit increase in TOP leads to a depreciation in the REER by 541 unit over an extended period, which is consistent with the previous studies, as articulated by Dornbusch (1974) and Balassa (1975), which initially supported the notion that trade liberalisation would result in a depreciation of the REER since a reduction in import tariffs leads to an imbalance in the current account due to heightened demand for imports, necessitating a subsequent depreciation in the real exchange rate.

4.3.1.2.2. The Resource Movement Effects of Oil Rents

a) The Impact on the Manufacturing Sector

In this part of the study, the ARDL model is used to analyse the relationship between the value-added share of the manufacturing sector, the oil rents share of GDP, and TOP.

Table 30: ARDL Regression Test

a) Trend Specification: Case 2/ Case 3

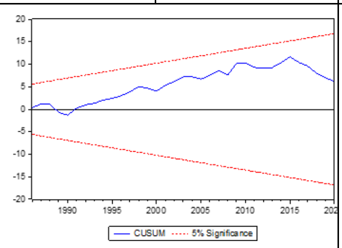
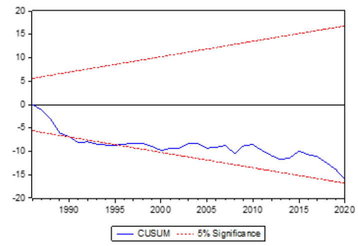
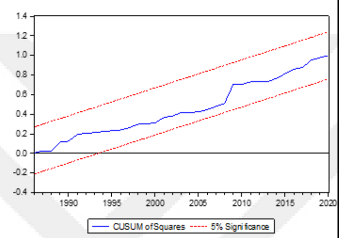
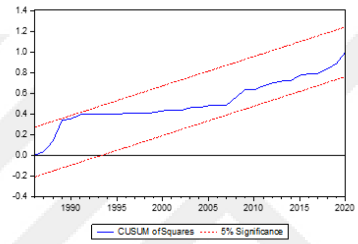
Variable	Coefficient	Std. Error	t-Statistic	P-value
MAN (-1)	0.874054	0.047105	18.55551	0.0000
OILRENTS	-0.055638	0.018568	-2.996489	0.0050
OILRENTS (-1)	0.026985	0.019496	1.384114	0.1751
TOP	-2.002334	1.652060	-1.212023	0.2336
C	2.607588	0.786359	3.316027	0.0021
Selected Model: ARDL (1, 1, 0)				

b) Trend Specification: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
MAN (-1)	0.385249	0.093038	4.140773	0.0002
OILRENTS	-0.030570	0.012101	-2.526316	0.0162
TOP	3.826380	1.642768	2.329227	0.0257
C	4.874248	0.988517	4.930868	0.0000
@TREND	0.085201	0.018349	4.643468	0.0000
Selected Model: ARDL (1, 0, 0)				

After the ARDL estimation and before moving to the Bounds test, it is strictly necessary to perform the residuals diagnosis.

Table 31: Diagnostic Test of Residuals

Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.700686	0.700686	0.892894	0.892894	Residuals are normally distributed
Serial Correlation LM Test	0.1821	0.1821	0.2097	0.2097	No serial correlation is detected
Heteroskedasticity Test	0.0034	0.0034	0.0115	0.0115	Heteroscedasticity in cases 2,3, 4 and 5
CUSUM Test					The model indicates stability
CUSUM of Squares Test					The model indicates structural stability

The Breusch-Pagan-Godfrey test for heteroskedasticity showed a p-value lower than 5%, indicating that residuals suffer from heteroskedasticity in all cases, therefore, the HAC (Newey-West) estimator is employed to account for potential heteroskedasticity in the ARDL model.

Table 32: The Bounds Test

Significance level	Critical Value							
	Case 2		Case 3		Case 4		Case 5	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	4.13	5	5.15	6.36	4.99	5.85	6.34	7.52
5%	3.1	3.87	3.79	4.85	3.88	4.61	4.87	5.85
10%	2.63	3.35	3.17	4.14	3.38	4.02	4.19	5.06
F-Statistic	2.515926		2.475143		12.71702		15.91034	

The Bounds test results presented in Table 32 reveal that the F-statistic values for cases 2 and 3 are 2.515926 and 2.475143, respectively. These values fall below the critical lower bound I (0) across all significance levels, indicating a lack of cointegration in these trend specifications. Consequently, there is no need to further estimate the coefficients for the long-run relationship for these cases, as they do not exhibit a meaningful long-term equilibrium. In contrast, the F-statistic values for cases 4 and 5 are 12.71702 and 15.91034, respectively, which exceed the critical upper bound I (1) at the 5% significance level. This finding allows the rejection of the null hypothesis that suggests no cointegration relationship exists within the model. Thus, a cointegrating long-term relationship is present for cases 4 and 5.

According to the results presented above, cases 4 and 5 are considered the most suitable, since these cases exhibited significant trend coefficient at 10% significant level in the ARDL regression test in Table 30. Given these outcomes and considering the Bounds test indicating a cointegrating long-term relationship within the model for cases 4 and 5, it is deemed appropriate to further investigate the long-term relationship for these specifications.

Table 33: Long Run Relationship Estimation

	Variable	Coefficient	Std. Error	t-Statistic	P-value
Case 4	OILRENTS TOP @TREND	-0.049727 6.224276 0.138594	0.016264 2.646048 0.014112	-3.057503 2.352291 9.820703	0.0043 0.0244 0.0000
	EC = MAN - (-0.0497*OILRENTS + 6.2243*TOP + 0.1386*@TREND)				
Case 5	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
	OILRENTS TOP	-0.049727 6.224276	0.016264 2.646048	-3.057503 2.352291	0.0043 0.0244
	EC = MAN - (-0.0497*OILRENTS + 6.2243*TOP)				

* Indicates significance at 10%; ** at 5%; *** at 1%

In the context of the aforementioned trend specifications (cases 4 and 5), the long-run relationship estimation results presented in Table 33 indicate a significant negative influence (-0.049) of OILRENTS on the manufacturing sector. This suggests that a 1 unit increase in oil revenues leads to a 0.049 unit decrease in the manufacturing value-added share of GDP in the long run. These findings align with the study’s hypothesis, supporting the notion that an increase in oil rents is directly linked to the deterioration of the manufacturing sector, ultimately contributing to de-industrialisation. Additionally, TOP exhibits a significant positive impact (6.224) on the manufacturing sector in the long run. This implies that a 1 unit increase in trade openness results in a 6.224 unit rise in the manufacturing value-added share of GDP over the long term. These results suggest that greater openness to international trade fosters growth and expansion within the manufacturing sector, counterbalancing some of the adverse effects associated with increased oil revenues.

b) The Impact on the Agricultural Sector

In this part of the study, the ARDL model is used to analyse the relationship between the sectoral value-added share of the agricultural sector and the oil rents share of GDP, and TOP in Saudi Arabia as follows:

Table 34: ARDL Regression Test

a) **Trend Specification:** Case 2/ Case 3

Variable	Coefficient	Std. Error	t-Statistic	P-value
AGR (-1)	1.328432	0.159136	8.347766	0.0000
AGR (-2)	-0.558377	0.116264	-4.802682	0.0000
OILRENTS	-0.000599	0.008352	-0.071777	0.9432
OILRENTS (-1)	0.016813	0.007547	2.227806	0.0333
TOP	9.345147	1.662513	5.621098	0.0000
TOP (-1)	-5.465222	2.115254	-2.583719	0.0147
TOP (-2)	2.948984	1.361641	2.165758	0.0381
C	-0.520208	0.329846	-1.577125	0.1249
Selected Model: ARDL (2, 1, 2)				

b) **Trend Specification**: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
AGR (-1)	0.856434	0.130199	6.577897	0.0000
AGR (-2)	-0.205738	0.100759	-2.041875	0.0498
OILRENTS	-0.002530	0.007349	-0.344323	0.7329
OILRENTS (-1)	0.021869	0.006900	3.169275	0.0034
OILRENTS (-2)	-0.008301	0.004370	-1.899391	0.0669
TOP	8.375882	1.451854	5.769092	0.0000
C	0.275040	0.324253	0.848228	0.4028
@TREND	-0.015218	0.003484	-4.368340	0.0001
Selected Model: ARDL (2, 2, 0)				

After the ARDL estimation and before moving to the Bounds test, it is strictly necessary to perform the residuals diagnosis.

Table 35: Diagnostic Test of Residuals

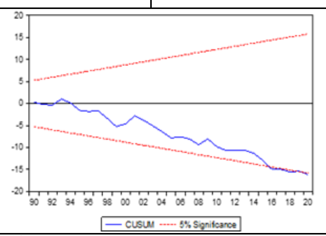
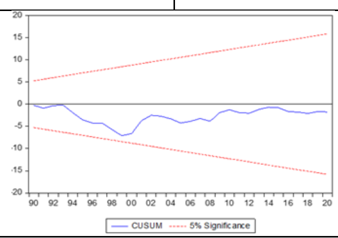
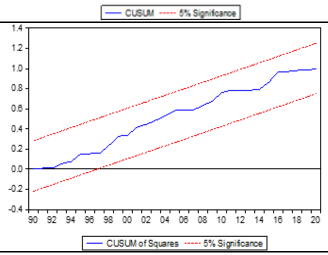
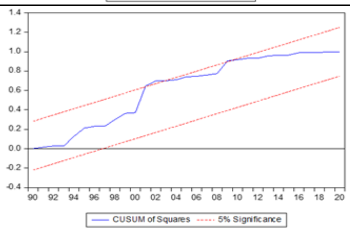
Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.091422	0.091422	0.371485	0.371485	Residuals are normally distributed
Serial Correlation LM Test	0.2129	0.2129	0.0689	0.0689	No serial correlation is detected
Heteroskedasticity Test	0.1011	0.1011	0.1661	0.1661	Residuals don’t show heteroscedasticity
CUSUM Test					The model indicates stability
CUSUM of Squares Test					The model indicates structural stability

Table 36: The Bounds Test

Significance level	Critical Value							
	Case 2		Case 3		Case 4		Case 5	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	4.13	5	5.15	6.36	4.99	5.85	6.34	7.52
5%	3.1	3.87	3.79	4.85	3.88	4.61	4.87	5.85
10%	2.63	3.35	3.17	4.14	3.38	4.02	4.19	5.06
F-Statistic	1.708381		2.249179		14.76150		17.92557	

The Bounds test results presented in Table 36 show that the F-statistic values for cases 2 and 3 are (1.708381) and (2.249179), respectively, both of which are below the critical lower bound I (0) at the 10% significance level. This finding suggests that there is no evidence of a cointegration relationship in these models. In contrast, the F-statistic values for cases 4 and 5, which are (14.76150) and (17.92557), respectively, exceed the critical upper bound I (1) at the 5% significance level. This allows for the rejection of the null hypothesis of no cointegration. Thus, a cointegrating long-term relationship is present for cases 4 and 5.

Based on the results presented above, cases 4 and 5 are considered the most suitable, since these cases exhibited significant trend coefficient at 1% significant level in the ARDL regression test in Table 34. Given these outcomes and considering the Bounds test indicating a cointegrating long-term relationship within the model for cases 4 and 5, it is deemed appropriate to further investigate the long-term relationship for these specifications.

Table 37: The Long-Run Relationship Estimation

	Variable	Coefficient	Std. Error	t-Statistic	P-value
Case 4	OILRENTS	0.031597	0.016478	1.917580	0.0644
	TOP	23.97873	2.177853	11.01026	0.0000
	@TREND	-0.043568	0.010129	-4.301115	0.0002
	EC = AGR - (0.0316*OILRENTS + 23.9787*TOP -0.0436*@TREND)				
Case 5	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
	OILRENTS	0.031597	0.016478	1.917580	0.0644
	TOP	23.97873	2.177853	11.01026	0.0000
	EC = AGR - (0.0316*OILRENTS + 23.9787*TOP)				

* Indicates significance at 10%; ** at 5%; *** at 1%

The long-run relationship estimation results presented in Table 37 for cases 4 and 5 indicate a significant positive effect of OILRENTS on AGR, with a coefficient of 0.031. This suggests that an increase in oil revenues by 1 unit corresponds to a 0.031 unit increase in the agricultural value-added share of GDP over the long term. These results challenge the study’s initial hypothesis, which posited that rising oil rents would negatively impact the agricultural sector, leading to a phenomenon known as de-agriculturalisation. Additionally, the analysis shows that TOP exerts a substantial positive influence on AGR, with a coefficient of 23.978. This implies that a 1 unit increase in TOP results in a 23.978 unit rise in the agricultural value-added share of GDP in the long run.

c) The Impact on the Services Sector

In this part of the study, the ARDL model is utilised to examine the relationship between the sectoral value-added share of the services sector and the oil rents share of GDP, and TOP in Saudi Arabia. The model is specified as follows:

Table 38: ARDL Regression Test

a) Trend Specification: Case 2 / Case 3

Variable	Coefficient	Std. Error	t-Statistic	P-value
SERV (-1)	0.903782	0.133382	6.775872	0.0000
SERV (-2)	-0.138373	0.080927	-1.709849	0.0970
OILRENTS	-0.424532	0.072364	-5.866649	0.0000
OILRENTS (-1)	0.259311	0.096419	2.689429	0.0113
TOP	14.65940	13.39792	1.094155	0.2821
TOP (-1)	-21.92730	13.29881	-1.648817	0.1090
C	17.25090	6.785907	2.542165	0.0161
Selected Model: ARDL (2, 1, 1)				

b) Trend Specification: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
SERV (-1)	0.610156	0.096367	6.331567	0.0000
OILRENTS	-0.424939	0.067849	-6.262993	0.0000
OILRENTS (-1)	0.045929	0.085963	0.534287	0.5967
TOP	11.29766	12.77654	0.884250	0.3830
TOP (-1)	-33.94093	12.22847	-2.775567	0.0090
C	35.53392	7.128683	4.984640	0.0000
@TREND	-0.092155	0.032998	-2.792736	0.0086
Selected Model: ARDL (1, 1, 1)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis.

Table 39: Diagnostic Test of Residuals

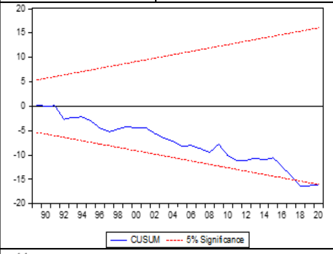
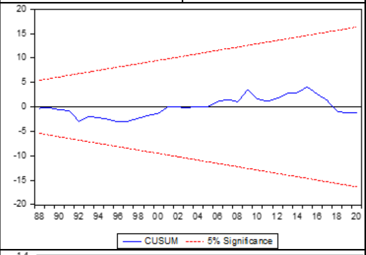
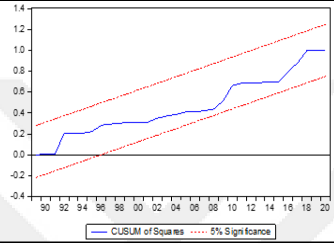
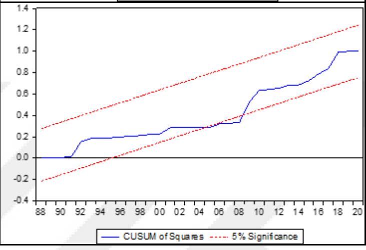
Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.309559	0.309559	0.934538	0.934538	Residuals are normally distributed
Serial Correlation LM Test	0.9426	0.9426	0.3037	0.3037	No serial correlation is detected
Heteroskedasticity Test	0.4981	0.4981	0.6526	0.6526	Residuals don't show heteroscedasticity
CUSUM Test					The model indicates stability
CUSUM of Squares Test					The model indicates structural stability

Table 40: Bounds Test

Significance level	Critical Value							
	Case 2		Case 3		Case 4		Case 5	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	4.13	5	5.15	6.36	4.99	5.85	6.34	7.52
5%	3.1	3.87	3.79	4.85	3.88	4.61	4.87	5.85
10%	2.63	3.35	3.17	4.14	3.38	4.02	4.19	5.06
F-Statistic	2.084520		2.763835		6.805697		9.041217	

The results of the Bounds test, as shown in Table 40, indicate that the F-statistic values for cases 2 and 3 are (2.084520) and (2.763835), respectively. These values fall below the critical lower bound I (0) at the 10% significance level, confirming the absence of a cointegration relationship in these models. Consequently, there is no need to estimate the coefficients of the long-run relationship for these trend specifications. In contrast, the F-statistic values for cases 4 and 5 are (6.805697) and (9.041217), both of which exceed the critical upper bound I (1) at the 5% significance level. This allows for the rejection of the null hypothesis, which asserts that no cointegration relationship exists within the model. Thus, a cointegrating long-term relationship is present for cases 4 and 5.

Based on the results presented above, cases 4 and 5 are considered the most suitable, since these cases exhibited a significant trend coefficient at the 1% significance level in the ARDL regression test in Table 38. Given these outcomes and the Bounds test's indication of a cointegrating long-term relationship within the model for cases 4 and 5, it is deemed appropriate to further investigate the long-term relationship under these specifications.

Table 41: The Long Run Relationship Estimation

	Variable	Coefficient	Std. Error	t-Statistic	P-value
Case 4	OILRENTS	-0.972211***	0.156928	-6.195270	0.0000
	TOP	-58.08295**	25.02854	-2.320669	0.0266
	@TREND	-0.236391	0.082924	-2.850676	0.0075
	EC = SERV - (-0.9722*OILRENTS -58.0830*TOP -0.2364*@TREND)				
Case 5	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
	OILRENTS	-0.972211***	0.156928	-6.195270	0.0000
	TOP	-58.08295**	25.02854	-2.320669	0.0266
	EC = SERV - (-0.9722*OILRENTS -58.0830*TOP)				

* Indicates significance at 10%; ** at 5%; *** at 1%

In the trend specifications for cases 4 and 5, the long-term relationship estimation presented in Table 41 indicates that OILRENTS has a significant negative effect of (-0.97) on SERV. This suggests that, contrary to expectations, an increase in oil rents does not foster growth in the services sector at the expense of the tradeable sector in Saudi Arabia. Instead, a 1 unit increase in oil rents results in a decrease of 0.972 unit in the services sector over the long run. This finding indicates an absence of Dutch Disease symptoms associated with oil rents.

Additionally, TOP exhibits a significant negative impact on the services sector in the long run. Specifically, an increase in TOP by a 1 unit corresponds to a substantial contraction of 58.08 unit in the services sector, underscoring the inverse relationship between trade openness and the performance of the services sector. This finding aligns with previous research; for instance, Tahir *et al.* (2019) confirmed that trade openness negatively affects the services sector in developing countries.

4.3.2. Oil-Poor Countries

4.3.2.1. Morocco

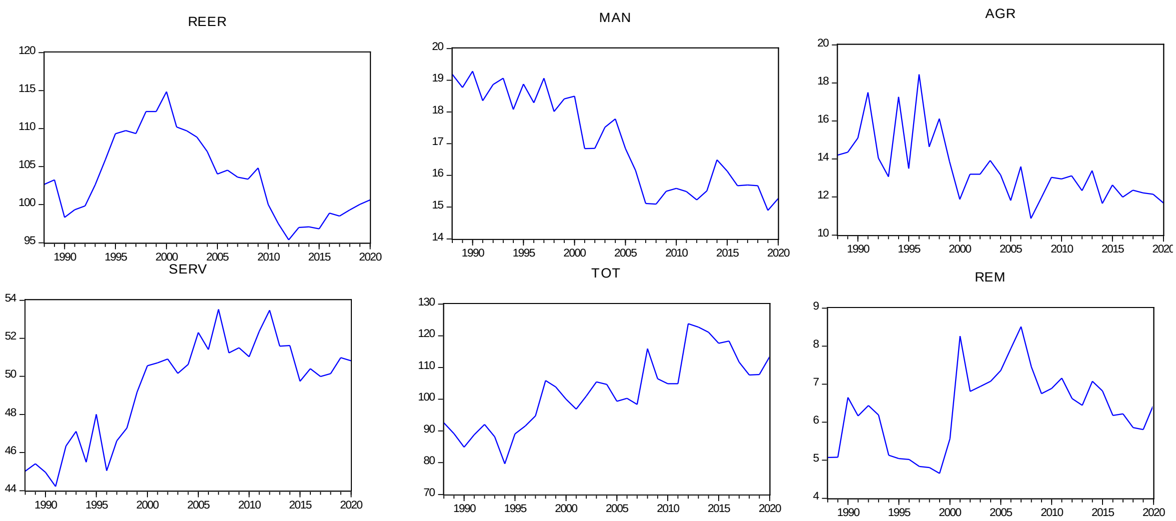
This part of the study explores the presence of Dutch Disease in Morocco, focusing especially on the potential presence of the spending and resource allocation effects caused by remittances. In this regard, the analysis employs remittances and TOT as the explanatory variables.

Table 42: Unit Root Test

	Augmented Dickey-Fuller Test					
	Level			First Differences		
Variables	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)
REER	-0.217529	-1.089034	-1.487988	-4.901998***	-4.825903***	-4.766475***
MAN	-1.185661*	-1.365892	-3.007362	-7.015483***	-7.212717***	-7.086851***
AGR	-0.625070	-3.382636**	-2.886977	-11.91479***	-11.76567***	-3.035653
SER	0.656122	-1.878599	-2.168021	-8.465440***	-8.578529**	-4.657227***
REM	-0.044573	-2.430198	-2.398671	-6.038088***	-5.955266***	-5.909676***
TOT	0.387627	-1.595359	-3.324503*	-6.163968***	-6.148465***	-6.046777***
	Phillips-Perron Test					
	Level			First Differences		
Variables	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)
REER	-0.206765	-1.283190	-1.638263	-4.901009***	-4.825710***	-4.763865***
MAN	-2.659709***	-1.137976	-2.975431	-7.261870***	-8.980937***	-8.811138***
AGR	-0.670939	-3.851186***	-6.188157***	-16.08208***	-18.50782***	-17.03073***
SER	1.154828	-1.725528	-1.904597	-8.272854***	-8.969668***	-10.53361***
REM	0.107199	-2.439044	-2.429829	-6.195717***	-6.095021***	-6.049714***
TOT	1.266764	-1.370895	-3.063428	-6.728397***	-11.90088***	-11.69226***

* Indicates significance at 10%; ** at 5%; *** at 1%

Figure 19: Time-Series Graphs of the Variables



The outcomes of the ADF and PP Unit Root tests in Table 42 reveal a mixed order of integration among the variables. REER, MAN, SER, REM, and TOT are non-stationary at their levels, but become stationary after taking their first differences. This implies that these variables are integrated of order one I (1). On the other hand, AGR is stationary at its level, indicating that it is integrated of order zero I (0). The plots of the variables, as shown in Figure 19, also support these findings. REER, MAN, SER, REM, and TOT exhibit a clear trend, either upward or downward, and a varying variance over time, indicating that they are non-stationary at their levels. However, AGR shows no apparent trend and has a constant variance over time, indicating that it is stationary at level.

4.3.2.1.1. The Spending Effects of Remittances

This part of the study investigates the impact of remittances on REER in Morocco, a country within the MENA region that is not rich in oil but relies on various foreign resources, including remittances. The theory suggests that remittances might cause a REER appreciation through the spending effect channel. Corden and Neary (1982) have outlined how an increase in remittance revenues triggers this effect, especially by boosting domestic demand for non-tradeable goods and services relative to tradeable ones. To capture this effect, the ARDL model establishes a relationship between REER, REM, and TOT.

Table 43: ARDL Regression Test

a) Trend Specification: Case 2/ Case 3

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
REER (-1)	0.928598	0.067098	13.83938	0.0000
REM	-1.828296	0.464913	-3.932559	0.0005
REM (-1)	0.816076	0.478886	1.704113	0.0998
TOT	-0.009750	0.031628	-0.308279	0.7602
C	14.83426	8.786728	1.688257	0.1029
Selected Model: ARDL (1, 1, 0)				

b) Trend Specification: Case 4/ Case 5

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
REER (-1)	0.929492	0.070675	13.15168	0.0000
REM	-1.833266	0.484054	-3.787315	0.0008
REM (-1)	0.817414	0.488718	1.672569	0.1064
TOT	-0.011850	0.052922	-0.223907	0.8246
C	14.92433	9.133000	1.634111	0.1143
@TREND	0.003413	0.068234	0.050016	0.9605
Selected Model: ARDL (1, 1, 0)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis.

Table 44: Diagnostic Test of Residuals

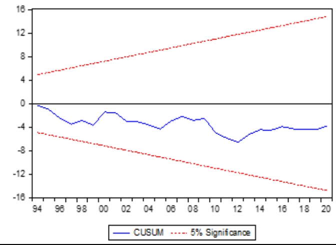
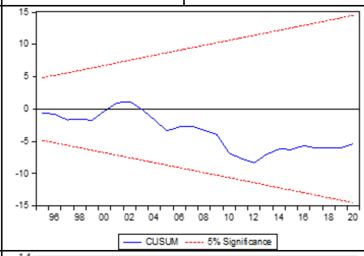
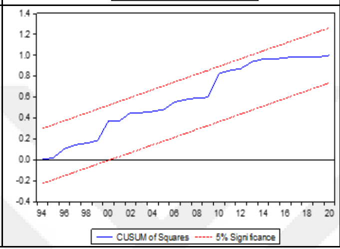
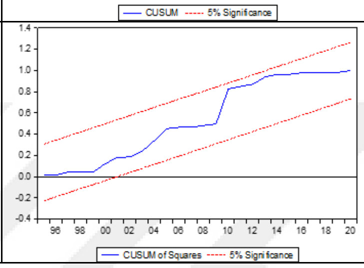
Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.605824	0.605824	0.608223	0.608223	Residuals are normally distributed
Serial Correlation LM Test	0.9112	0.9112	0.8983	0.8983	No serial correlation is detected
Heteroskedasticity Test	0.7166	0.7166	0.8531	0.8531	Residuals don't show heteroscedasticity
CUSUM Test					The model indicates stability
CUSUM of Squares Test					The model indicates structural stability

Table 45: The Bounds Test

Significance level	Critical Value							
	Case 2		Case 3		Case 4		Case 5	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	4.13	5	5.15	6.36	4.99	5.85	6.34	7.52
5%	3.1	3.87	3.79	4.85	3.88	4.61	4.87	5.85
10%	2.63	3.35	3.17	4.14	3.38	4.02	4.19	5.06
F-Statistic	2.331287		3.108355		2.245765		2.703129	

The results of the Bounds test, as shown in Table 45, indicate that the F-statistic values (2.331287), (3.108355), (2.245765), and (2.703129) all fall below the critical lower bound, I (0) at the 10% significance level in all cases, confirming the absence of a cointegration relationship in these models. Consequently, there is no evidence of a cointegrating long-run relationship in the model across all cases (2, 3, 4, and 5). As a result of these findings, there is no need to estimate the long-run coefficients for the trend specifications.

The Bounds test results reject the existence of long-term cointegration, this indicates that remittances do not have a significant long-run impact on the REER in Morocco, contradicting the hypothesis that large foreign inflows would lead to an appreciation of the domestic currency. In other words, remittances do not induce the Dutch Disease in Morocco over the long term.

4.3.2.1.2. The Resource Movement Effects of Remittances

a) The Impact on the Manufacturing Sector

This part of the study examines the impact of remittances on the allocation of value-added shares across several sectors in Morocco. In Morocco, an infusion of remittances can result in heightened disposable income, in which, with a positive income elasticity, an increase in disposable income results in higher expenditure and demand for both tradeable and non-tradeable products. The increased demand for goods leads to rising prices, as the nation's resources may be inadequate to satisfy this boosted demand, and the economic boom has not augmented these particular resources. The significant dependence of these nations on non-tradeable sectors, including tourism, real estate, and remittances for their growth strategies, renders them significantly vulnerable to external variables beyond their control. Furthermore, small markets limit economies of scale in non-tradeable sectors, resulting in lower productivity (Saab & Ayoub, 2010: 348). This results in a decrease in the value-added of certain industries, particularly agriculture and industry. This phenomenon is typically ascribed to the Resource Movement Effect, wherein resources are diverted from certain sectors to more lucrative opportunities within the oil industry and related industries, while the services sector frequently witnesses an augmentation in its value-added shares.

Table 46: ARDL Regression Test

a) **Trend Specification:** Case 2/ Case 3

Variable	Coefficient	Std. Error	t-Statistic	P-value
MAN (-1)	0.603449	0.196424	3.072175	0.0052
MAN (-2)	0.340856	0.188067	1.812420	0.0825
REM	-0.159012	0.155280	-1.024030	0.3160
REM (-1)	-0.297322	0.193015	-1.540406	0.1365
REM (-2)	0.309816	0.177749	1.743002	0.0941
TOT	0.003905	0.017444	0.223874	0.8248
C	1.333895	5.086956	0.262219	0.7954
Selected Model: ARDL (2, 2, 0)				

b) **Trend Specification**: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
MAN (-1)	0.130407	0.173523	0.751526	0.4600
REM	-0.234945	0.130667	-1.798040	0.0853
REM (-1)	-0.249725	0.138301	-1.805659	0.0841
TOT	0.003265	0.016429	0.198726	0.8442
TOT (-1)	0.015938	0.017867	0.892063	0.3816
TOT (-2)	0.023118	0.017996	1.284608	0.2117
C	16.06880	3.943121	4.075149	0.0005
@TREND	-0.153295	0.035019	-4.377444	0.0002
Selected Model: ARDL (1, 1, 2)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis.

Table 47: Diagnostic Test of Residuals

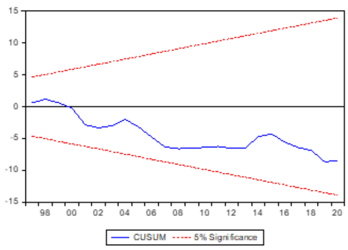
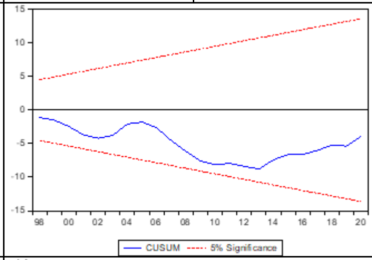
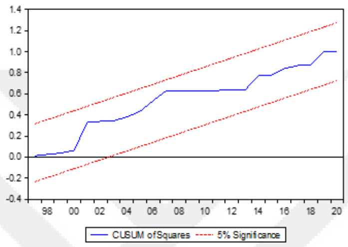
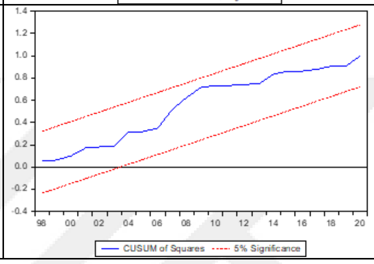
Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.719062	0.719062	0.494410	0.494410	Residuals are normally distributed
Serial Correlation LM Test	0.5760	0.5760	0.7016	0.7016	No serial correlation is detected
Heteroskedasticity Test	0.9544	0.9544	0.9943	0.9943	Residuals don't show heteroscedasticity
CUSUM Test					The model indicates stability
CUSUM of Squares Test					The model indicates structural stability

Table 48: Bounds Test

Significance level	Critical Value							
	Case 2		Case 3		Case 4		Case 5	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	4.13	5	5.15	6.36	4.99	5.85	6.34	7.52
5%	3.1	3.87	3.79	4.85	3.88	4.61	4.87	5.85
10%	2.63	3.35	3.17	4.14	3.38	4.02	4.19	5.06
F-Statistic	0.715984		0.367895		7.247429		9.660544	

According to the Bounds test results presented in Table 48, the F-statistic values for cases 2 and 3 (0.715984) and (0.367895), respectively, are below the critical lower bound, I (0), at the 10% significance level. This confirms the absence of a cointegration relationship in these cases, eliminating the need to estimate long-run coefficients for these trend specifications. However, in cases 4 and 5, the F-statistic values, (7.247429) and (9.660544), exceed the critical upper bound, I (1), at the 5% significance level, allowing the rejection of the null hypothesis of no cointegration. This suggests that a long-run relationship exists within the model for these trend specifications, indicating a long-term equilibrium relationship between the variables under consideration.

According to the results presented above, cases 4 and 5 are considered the most suitable, since these cases exhibited a significant trend coefficient at the 1% significance level in the ARDL regression test in Table 46. Given these outcomes and the Bounds test's indication of a cointegrating long-term relationship within the model for cases 4 and 5, it is deemed appropriate to further investigate the long-term relationship under these specifications.

Table 49: The Long-Run Relationship Estimation

	Variable	Coefficient	Std. Error	t-Statistic	P-value
Case 4	REM	-0.557354***	0.121428	-4.590003	0.0001
	TOT	0.048668*	0.023974	2.030059	0.0541
	@TREND	-0.176284	0.027803	-6.340483	0.0000
	EC = MAN - (-0.5574*REM + 0.0487*TOT -0.1763*@TREND)				
Case 5	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
	REM	-0.557354***	0.121428	-4.590003	0.0001
	TOT	0.048668*	0.023974	2.030059	0.0541
	EC = MAN - (-0.5574*REM + 0.0487*TOT)				

* Indicates significance at 10%; ** at 5%; *** at 1%

In the trend specifications listed above (cases 4 and 5), the long-term relationship estimation in Table 49 showed that REM had a significant negative effect (-0.557) on MAN. This means that a 1 unit increase in remittances causes the manufacturing sector in Morocco to shrink by 0.557 unit in the long run. The findings support the research hypothesis that an increase in remittances causes a contraction in the tradeable sector through resource movement effects, which is considered to be one of the main symptoms of the Dutch Disease. On the other hand, TOT has a positive and statistically significant impact on the manufacturing sector (0.048). This suggests that a 1 unit improvement in TOT leads to a 0.048 unit increase in the manufacturing sector in the long run.

b) The Impact on the Agricultural Sector

This study examines the influence of remittances on Morocco's agricultural sector. The ARDL model associates the AGR with REM, along with TOT.

Table 50: ARDL Regression Test

a) Trend Specification: Case 2/ Case 3

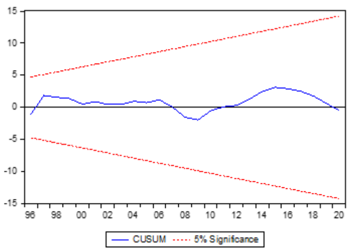
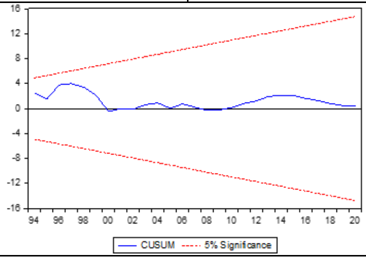
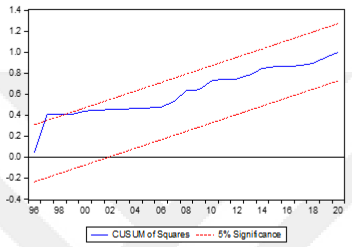
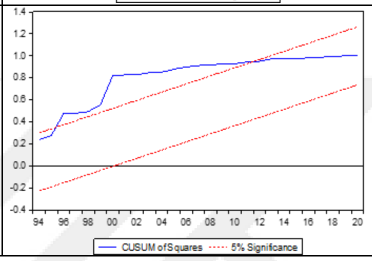
Variable	Coefficient	Std. Error	t-Statistic	P-value
AGR (-1)	-0.339466	0.176289	-1.925629	0.0656
REM	-0.779810	0.264490	-2.948358	0.0068
TOT	-0.041614	0.035314	-1.178391	0.2497
TOT (-1)	-0.004704	0.045326	-0.103784	0.9182
TOT (-2)	-0.079368	0.036697	-2.162769	0.0403
C	35.91407	5.123722	7.009372	0.0000
Selected Model: ARDL (1, 0, 2)				

b) Trend Specification: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
AGR (-1)	-0.354701	0.180086	-1.969621	0.0592
REM	-0.777791	0.285984	-2.719698	0.0113
TOT	-0.014126	0.019061	-0.741106	0.4650
C	26.76781	4.723575	5.666853	0.0000
@TREND	-0.125989	0.033155	-3.799946	0.0007
Selected Model: ARDL (1, 0, 0)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis.

Table 51: Diagnostic Test of Residuals

Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.931268	0.931268	0.619297	0.619297	Residuals are normally distributed
Serial Correlation LM Test	0.9629	0.9629	0.6257	0.6257	No serial correlation is detected
Heteroskedasticity Test	0.4788	0.4788	0.0149	0.0149	Heteroscedasticity in cases 4 and 5
CUSUM Test					The model indicates stability
CUSUM of Squares Test					The model indicates structural instability in cases 4 and 5

The Breusch-Pagan-Godfrey test for heteroskedasticity showed a p-value lower than 5%, indicating that residuals suffer from heteroskedasticity in cases 4 and 5, therefore, the HAC (Newey-West) estimator is employed to account for potential heteroskedasticity in the ARDL model.

Table 52: The Bounds Test

Significance level	Critical Value							
	Case 2		Case 3		Case 4		Case 5	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	4.13	5	5.15	6.36	4.99	5.85	6.34	7.52
5%	3.1	3.87	3.79	4.85	3.88	4.61	4.87	5.85
10%	2.63	3.35	3.17	4.14	3.38	4.02	4.19	5.06
F-Statistic	14.63417		19.47359		14.61954		19.46552	

The Bounds test results presented in Table 52, show that the F-statistic values for cases 2, 3, 4 and 5 are (14.63417), (19.47359), (14.61954), (19.46552) all exceed the critical upper bound I (1) at a 5% significance level. This outcome allows for the rejection of the null hypothesis, which posits the absence of a cointegration relationship in the model. This suggests that a long-run relationship exists within the model for these trend specifications, indicating a long-term equilibrium relationship between the variables under consideration.

Based on the results presented above, cases 4 and 5 are considered the most suitable, since these cases exhibited a significant trend coefficient at the 1% significance level in the ARDL regression test in Table 50. Given these outcomes and the Bounds test's indication of a cointegrating long-term relationship within the model for cases 4 and 5, it is deemed appropriate to further investigate the long-term relationship under these specifications.

Table 53: The Long-Run Relationship Estimation

	Variable	Coefficient	Std. Error	t-Statistic	P-value
Case 4	REM	-0.574142***	0.145536	-3.945031	0.0005
	TOT	-0.010427	0.014319	-0.728220	0.4727
	@TREND	-0.093001	0.018647	-4.987407	0.0000
	EC = AGR - (-0.5741*REM -0.0104*TOT -0.0930*@TREND)				
Case 5	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
	REM	-0.574142***	0.145536	-3.945031	0.0005
	TOT	-0.010427	0.014319	-0.728220	0.4727
	EC = AGR - (-0.5741*REM -0.0104*TOT)				

* Indicates significance at 10%; ** at 5%; *** at 1%

In the trend specifications listed above (cases 4 and 5), the long-term relationship estimation in Table 53 showed a significant negative effect (-0.574) of REM on AGR, which means that an increase in remittances by 1 unit causes a decrease of about -0.574 unit in the agricultural sector in the long run in Morocco. These findings support the research hypothesis, which states that an increase in remittances causes a decline in the agriculture value-added share of GDP in Morocco (de-agriculturalisation), which means that remittances are causing Dutch Disease in Morocco in the long run. TOT, on the other hand, has an insignificant long-term impact on AGR in Morocco.

c) The Impact on the Services sector

This part examines the influence of remittances on Morocco's services sector. The ARDL model associates the SERV with REM, along with TOT.

Table 54: ARDL Regression Test

a) **Trend Specification:** Case 2/ Case 3

Variable	Coefficient	Std. Error	t-Statistic	P-value
SERV (-1)	0.375669	0.204650	1.835662	0.0779
SERV (-2)	0.326070	0.182202	1.789604	0.0852
REM	0.323995	0.336350	0.963267	0.3443
TOT	0.025951	0.035451	0.732046	0.4707
C	10.23457	5.533126	1.849690	0.0758
Selected Model: ARDL (2, 0, 0)				

b) **Trend Specification**: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
SERV (-1)	0.357078	0.211369	1.689358	0.1036
SERV (-2)	0.290217	0.199610	1.453918	0.1584
REM	0.365223	0.352190	1.037005	0.3097
TOT	0.017296	0.040291	0.429263	0.6714
C	13.10368	8.222618	1.593614	0.1236
@TREND	0.026291	0.055025	0.477791	0.6370
Selected Model: ARDL (2, 0, 0)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis.

Table 55: Diagnostic Test of Residuals

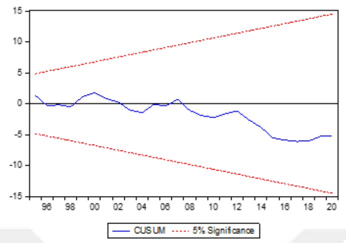
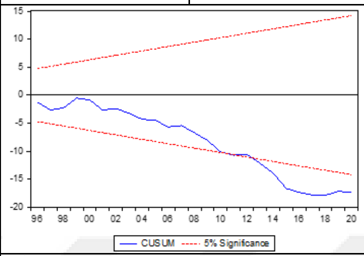
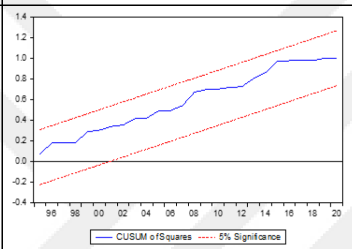
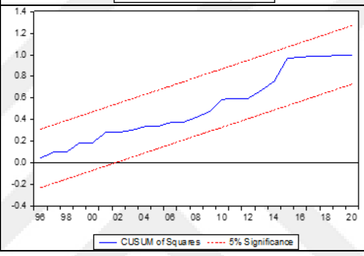
Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.626142	0.626142	0.678772	0.678772	Residuals are normally distributed
Serial Correlation LM Test	0.2752	0.2752	0.3339	0.3339	No serial correlation is detected
Heteroskedasticity Test	0.8178	0.8178	0.8129	0.8129	Residuals don't show heteroscedasticity
CUSUM Test					The model indicates instability in cases 4 and 5
CUSUM of Squares Test					The model indicates structural stability

Table 56: The Bounds Test

Significance level	Critical Value							
	Case 2		Case 3		Case 4		Case 5	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	4.13	5	5.15	6.36	4.99	5.85	6.34	7.52
5%	3.1	3.87	3.79	4.85	3.88	4.61	4.87	5.85
10%	2.63	3.35	3.17	4.14	3.38	4.02	4.19	5.06
F-Statistic	1.167096		1.125449		0.876104		0.825570	

The F-statistic values obtained upon conducting the Bounds test in Table 56 (1.167096), (1.125449), (0.876104), and (0.825570) are all lower than the critical value for the lower bound, I (0), at the 10% significance level. This leads to the conclusion that there is no evidence of a cointegrating long-run relationship in the model across all cases (2, 3, 4, and 5). This suggests that the variables under consideration do not move together in the long run. Given these results, there is no need to estimate the coefficients of the long-run relationship for all of the trend specifications.

The Bounds test results rejected the existence of a long-term cointegration between remittances and the services sector in Morocco across all cases (2, 3, 4, and 5). This implies that remittances do not have a significant impact on the services sector in the long run, contrary to the hypothesis that the large foreign inflows lead to an expansion of the services sector at the expense of other tradeable sectors. In other words, the remittances do not induce the Dutch Disease in Morocco in the long run.

4.3.2.2. Tunisia

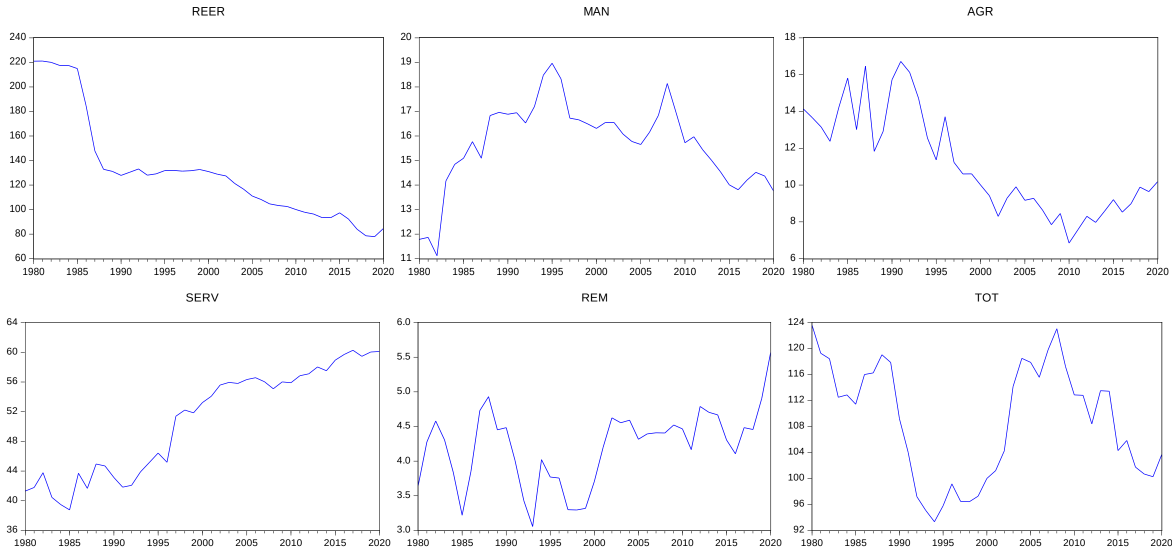
This part of the study explores the presence of Dutch Disease in Tunisia, focusing on the potential presence of the spending and resource allocation effects caused by remittances. In this regard, the analysis employs remittances and TOT as the explanatory variables.

Table 57: Unit Root Test

	Augmented Dickey-Fuller Test					
	Level			First Differences		
Variables	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)
REER	-1.839182	-2.150282	-3.089604	-2.663525***	-2.876905*	-2.876905*
MAN	0.137612	-2.502052	-2.580806	-4.313710***	-4.295188***	-4.295188***
AGR	-0.848146	-1.895067	-2.826338	-8.803500***	-8.739205***	-8.739205***
SER	1.623314	-0.760165	-2.557490	-7.230366***	-7.833587***	-7.833587***
REM	0.507568	-2.008038	-2.440469	-5.179423***	-5.141429***	-5.141429***
TOT	-0.925985	-2.049679	-1.993747	-4.852866***	-4.806058***	-4.806058***
	Phillips-Perron Test					
	Level			First Differences		
Variables	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)
REER	-2.753408**	-2.150282	-1.537456	-2.555689**	-2.635550*	-2.664026
MAN	0.119139	-2.307354	-2.303880	-5.608421***	-5.546962***	-6.434712***
AGR	-0.959406	-1.677775	-2.815283	-9.606720***	-9.813827***	-9.764487***
SER	2.297805**	-0.589147	-2.471510	-7.226163***	-8.021979***	-7.905725***
REM	1.577131	-1.887790	-2.167752	-5.408590***	-5.489896***	-7.468671***
TOT	-0.829869	-2.145223	-2.057848	-4.846529***	-4.801461***	-4.756696***

* Indicates significance at 10%; ** at 5%; *** at 1%

Figure 20: Time-Series Graphs of the Variables



The outcomes of the stationarity tests in Table 57 revealed that all the variables REER, MAN, AGR, SER, REM, and TOT are non-stationary at their levels, but become stationary after taking their first differences. This implies that these variables are integrated of order one I (1). The plots of the variables, as shown in Figure 20, also support these findings. REER, MAN, AGR, SER, REM, and TOT exhibit a clear trend, either upward or downward, and a varying variance over time, indicating that they are non-stationary at their levels.

4.3.2.2.1. The Spending Effects of Remittances

This part of the study aims to investigate the impact of remittances on the real effective exchange rate in Tunisia.

Table 58: ARDL Regression Test

a) **Trend Specification:** Case 2/ Case 3

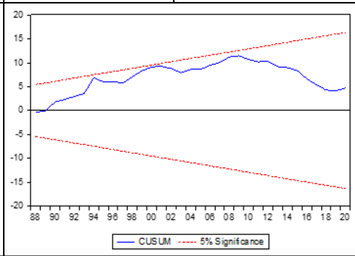
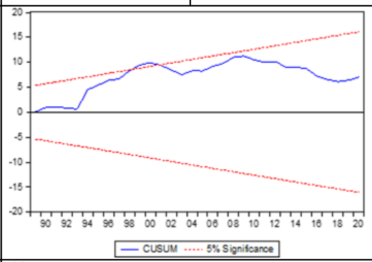
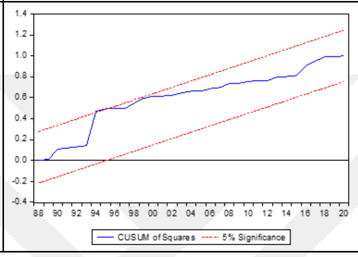
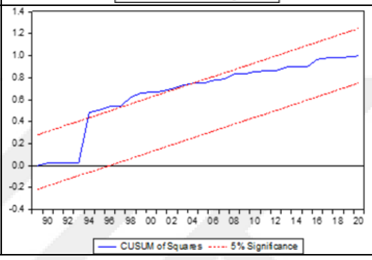
Variable	Coefficient	Std. Error	t-Statistic	P-value
REER (-1)	1.482559	0.126384	11.73060	0.0000
REER (-2)	-0.501603	0.113596	-4.415689	0.0001
REM	-2.635785	3.590909	-0.734016	0.4681
REM (-1)	10.00999	5.923375	1.689913	0.1005
TOT	-0.387467	0.176407	-2.196434	0.0352
C	11.90459	12.83489	0.927518	0.3604
Selected Model: ARDL (2, 1, 0)				

b) **Trend Specification**: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
REER (-1)	1.531360	0.117946	12.98356	0.0000
REER (-2)	-0.638143	0.127901	-4.989356	0.0000
REM	-0.376106	3.773836	-0.099661	0.9212
REM (-1)	8.956762	5.651431	1.584866	0.1228
TOT	-0.326801	0.156783	-2.084409	0.0452
C	20.00889	12.90143	1.550906	0.1308
@TREND	-0.376460	0.202234	-1.861507	0.0719
Selected Model: ARDL (2, 1, 0)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis.

Table 59: Diagnostic Test of Residuals

Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.119354	0.119354	0.197478	0.197478	Residuals are normally distributed
Serial Correlation LM Test	0.3063	0.2386	0.1880	0.1880	No serial correlation is detected
Heteroskedasticity Test	0.0009	0.0009	0.0013	0.0013	Heteroscedasticity in cases 2, 3, 4 and 5
CUSUM Test					The model indicates stability
CUSUM of Squares Test					The model indicates structural stability

The Breusch-Pagan-Godfrey test for heteroskedasticity showed a p-value lower than 5%, indicating that residuals suffer from heteroskedasticity in all cases 2, 3, 4, and 5. Therefore, the HAC (Newey-West) estimator is employed to account for potential heteroskedasticity in the ARDL model.

Table 60: The Bounds Test

Significance level	Critical Value							
	Case 2		Case 3		Case 4		Case 5	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	4.13	5	5.15	6.36	4.99	5.85	6.34	7.52
5%	3.1	3.87	3.79	4.85	3.88	4.61	4.87	5.85
10%	2.63	3.35	3.17	4.14	3.38	4.02	4.19	5.06
F-Statistic	5.157624		6.186505		6.137173		6.672357	

After performing the Bounds test in Table 60, the F-statistic values (5.157624), (6.186505), (6.137173), and (6.672357) are greater than the critical upper bound I (1) at a 5% level in all of the four cases, which allows the rejection of the null hypothesis stating that there is no cointegration relationship in the model. This suggests that a long-run relationship exists within the model, indicating a long-term equilibrium relationship between the variables under consideration.

Based on the results presented above, cases 4 and 5 are considered the most suitable, since these cases exhibited a significant trend coefficient at the 10% significance level in the ARDL regression test in Table 58. Given these outcomes and the Bounds test's indication of a cointegrating long-term relationship within the model for cases 4 and 5, it is deemed appropriate to further investigate the long-term relationship under these specifications.

Table 61: The Long Run Relationship Estimation

	Variable	Coefficient	Std. Error	t-Statistic	P-value
Case 4	REM	80.35590	52.51219	1.530233	0.1358
	TOT	-3.060414	2.406449	-1.271755	0.2126
	@TREND	-3.525465	1.015985	-3.469999	0.0015
	EC = REER - (80.3559*REM -3.0604*TOT -3.5255*@TREND)				
Case 5	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
	REM	80.35590	52.51219	1.530233	0.1358
	TOT	-3.060414	2.406449	-1.271755	0.2126
	EC = REER - (80.3559*REM -3.0604*TOT)				

* Indicates significance at 10%; ** at 5%; *** at 1%

The Bounds test confirmed that the model had a long-term cointegration relationship. However, the long-run results in Table 61 showed that both explanatory variables, that is, remittances and TOT, had no significant effect on Tunisia's REER. This outcome contradicts the study's hypothesis, which posits a positive impact of remittances on the REER, thereby triggering the Spending Effect, a key mechanism in the propagation of Dutch Disease. In a nutshell, these findings confirm that remittances do not pose a risk of Dutch Disease in Tunisia.

4.3.2.2.2. The Resource Movement Effects of Remittances

a) The Impact on the Manufacturing Sector

This part of the study aims to investigate the impact of remittances on the manufacturing sector in Tunisia.

Table 62: ARDL Regression Test

a) Trend Specification: Case 2/ Case 3

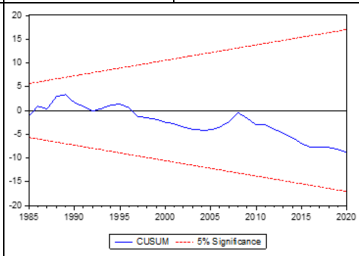
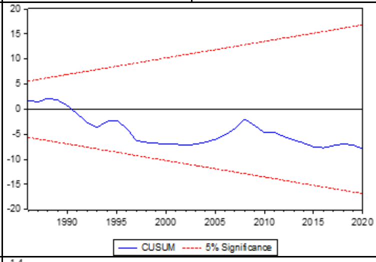
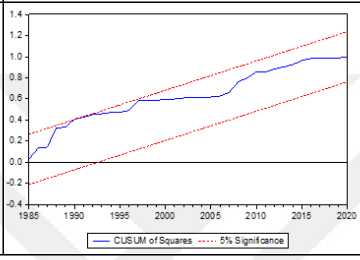
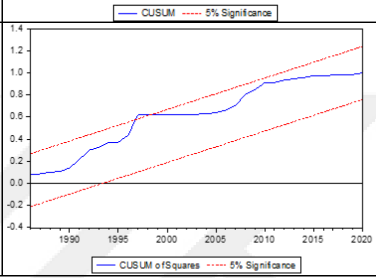
Variable	Coefficient	Std. Error	t-Statistic	P-value
MAN (-1)	0.814893	0.080178	10.16361	0.0000
REM	-0.317267	0.276357	-1.148035	0.2585
TOT	0.008615	0.017338	0.496864	0.6223
C	3.367793	2.487250	1.354022	0.1842
Selected Model: ARDL (1, 0, 0)				

b) Trend Specification: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
MAN (-1)	0.837096	0.073872	11.33169	0.0000
REM	-0.028417	0.286207	-0.099289	0.9215
TOT	-0.002182	0.023125	-0.094378	0.9253
C	3.380199	2.398076	1.409546	0.1675
@TREND	-0.020063	0.013319	-1.506308	0.1410
Selected Model: ARDL (1, 0, 0)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis.

Table 63: Diagnostic Test of Residuals

Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.080005	0.080005	0.392222	0.392222	Residuals are normally distributed
Serial Correlation LM Test	0.4708	0.4708	0.3203	0.3203	No serial correlation is detected
Heteroskedasticity Test	0.2512	0.2512	0.0392	0.0392	Heteroscedasticity in cases 4 and 5
CUSUM Test					The model indicates stability
CUSUM of Squares Test					The model indicates structural stability

The Breusch-Pagan-Godfrey test for heteroskedasticity showed a p-value lower than 5%, indicating that residuals suffer from heteroskedasticity in cases 4 and 5. Therefore, the HAC (Newey-West) estimator is employed to account for potential heteroskedasticity in the ARDL model.

Table 64: The Bounds Test

Significance level	Critical Value							
	Case 2		Case 3		Case 4		Case 5	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	4.13	5	5.15	6.36	4.99	5.85	6.34	7.52
5%	3.1	3.87	3.79	4.85	3.88	4.61	4.87	5.85
10%	2.63	3.35	3.17	4.14	3.38	4.02	4.19	5.06
F-Statistic	1.641291		2.137918		2.227062		1.530003	

The F-statistic values obtained upon conducting the Bounds test in Table 64 (1.641291), (2.137918), (2.227062), and (1.530003) are all lower than the critical value for the lower bound, I (0), at the 10% significance level. This leads to the conclusion that there is no evidence of a cointegrating long-run relationship in the model across all cases (2, 3, 4, and 5). This suggests that the variables under consideration do not move together in the long run. Given these results, there is no need to estimate the coefficients of the long-run relationship for all of the trend specifications.

The results imply that remittances do not have a significant impact on the manufacturing sector in the long run, which denies the hypothesis of the study indicating that the huge foreign inflows coming from the workers' remittances cause a shift and a movement of the resources from the tradeable sector to the non-tradeable sector (services) through the resources allocation effect, which in turn causes a decrease in the manufacturing value-added share to GDP. In a nutshell, the remittances are not causing the Dutch Disease in Tunisia.

b) The Impact on the Agricultural Sector

This part of the study aims to investigate the impact of remittances on the agricultural sector in Tunisia.

Table 65: ARDL Regression Test

a) Trend Specification: Case 2/ Case 3

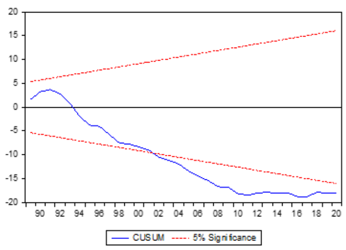
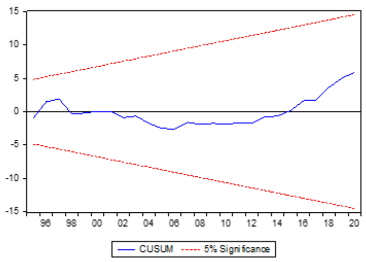
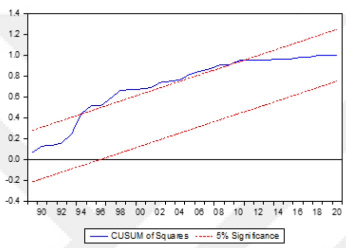
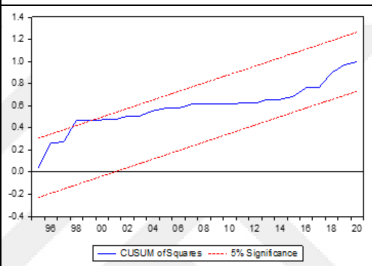
Variable	Coefficient	Std. Error	t-Statistic	P-value
AGR (-1)	0.546791	0.159255	3.433434	0.0017
AGR (-2)	0.408381	0.163258	2.501452	0.0177
REM	0.050735	0.672496	0.075443	0.9403
REM (-1)	-0.121703	0.900395	-0.135166	0.8933
REM (-2)	1.307635	0.692240	1.888992	0.0680
TOT	-0.011615	0.033041	-0.351533	0.7275
C	-3.523436	3.887018	-0.906463	0.3715
Selected Model: ARDL (2, 2, 0)				

b) Trend Specification: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
AGR (-1)	-0.015438	0.202294	-0.076314	0.9398
REM	1.197565	0.639930	1.871400	0.0726
REM (-1)	1.373094	0.742991	1.848063	0.0760
REM (-2)	1.122144	1.260273	0.890398	0.3814
REM (-3)	1.339648	0.972913	1.376945	0.1803
REM (-4)	1.931153	0.759687	2.542037	0.0173
TOT	-0.157278	0.047150	-3.335715	0.0026
TOT (-1)	0.079875	0.070307	1.136087	0.2663
TOT (-2)	-0.170470	0.072961	-2.336453	0.0274
C	16.29551	3.771132	4.321119	0.0002
@TREND	-0.337887	0.082489	-4.096143	0.0004
Selected Model: ARDL (1, 4, 2)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis.

Table 66: Diagnostic Test of Residuals

Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.059696	0.059696	0.101579	0.101579	Residuals are normally distributed
Serial Correlation LM Test	0.1030	0.1030	0.6622	0.6622	No serial correlation is detected
Heteroskedasticity Test	0.1023	0.1023	0.0227	0.0227	Heteroscedasticity in cases 4 and 5
CUSUM Test					The model indicates instability in cases 2 and 3
CUSUM of Squares Test					The model indicates structural instability in cases 2 and 3

The Breusch-Pagan-Godfrey test for heteroskedasticity showed a p-value lower than 5%, indicating that residuals suffer from heteroskedasticity in cases 4 and 5. Therefore, the HAC (Newey-West) estimator is employed to account for potential heteroskedasticity in the ARDL model.

Table 67: The Bounds Test

	Critical Value							
Significance level	**Case 2**		**Case 3**		**Case 4**		**Case 5**	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	4.13	5	5.15	6.36	4.99	5.85	6.34	7.52
5%	3.1	3.87	3.79	4.85	3.88	4.61	4.87	5.85
10%	2.63	3.35	3.17	4.14	3.38	4.02	4.19	5.06
F-Statistic	1.435180		1.850193		10.17685		13.55880	

The Bounds test results presented in Table 67 show that the F-statistic values for cases 2 and 3 (1.435180) and (1.850193), respectively, are below the critical lower bound, I (0), at the 10% significance level. This outcome confirms that there is no cointegration relationship in the model for these cases. Given these findings, there is no requirement to estimate the coefficients of the long-run relationship for these trend specifications. On the other hand, the F-statistic values (10.17685) and (13.55880) from cases 4 and 5 are higher than the critical upper bound I (1) at a 5% significance level. This outcome allows for the rejection of the null hypothesis, which posits the absence of a cointegration relationship in the model. This suggests that a long-run relationship exists within the model, indicating a long-term equilibrium relationship between the variables under consideration.

According to the results presented above, cases 4 and 5 are considered the most suitable, since these cases exhibited a significant trend coefficient at the 1% significance level in the ARDL regression test in Table 65. Given these outcomes and the Bounds test's indication of a cointegrating long-term relationship within the model for cases 4 and 5, it is deemed appropriate to further investigate the long-term relationship under these specifications.

Table 68: The Long-Run Relationship Estimation

	Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
Case 4	REM	6.857736***	0.756038	9.070620	0.0000
	TOT	-0.244105***	0.034469	-7.081926	0.0000
	@TREND	-0.332750***	0.020700	-16.07497	0.0000
	EC = AGR - (6.8577*REM -0.2441*TOT -0.3327*@TREND)				
Case 5	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
	REM	6.857736***	0.756038	9.070620	0.0000
	TOT	-0.244105***	0.034469	-7.081926	0.0000
	EC = AGR - (6.8577*REM -0.2441*TOT)				

* Indicates significance at 10%; ** at 5%; *** at 1%

In the trend specifications listed above (cases 4 and 5), the long-term relationship estimation in Table 68 showed a significant positive impact (6.8577) of REM on the AGR, which means that an increase in remittances by 1 unit causes an increase of about 6.857 unit in the agricultural sector in the long run in Tunisia. These findings contradict the research hypothesis, which states that an increase in remittances causes a decline in the agriculture value-added share of GDP in Tunisia, causing de-agriculturalisation, which means that remittances do not cause Dutch Disease in Tunisia in the long run. TOT, on the other hand, has a significant negative (-0.2441) long-term impact on the AGR, since a 1 unit increase in the terms of trade causes a decrease in the AGR by 0.2441 unit in the long run in Tunisia.

c) The Impact on the Services Sector

This part of the study aims to investigate the impact of remittances on the services sector in Tunisia.

Table 69: ARDL Regression Test

a) Trend Specification: Case 2/ Case 3

Variable	Coefficient	Std. Error	t-Statistic	P-value
SERV (-1)	0.620591	0.164900	3.763438	0.0007
SERV (-2)	0.405317	0.167235	2.423640	0.0212
REM	0.099815	0.816546	0.122240	0.9035
REM (-1)	-0.884191	1.038468	-0.851438	0.4009
REM (-2)	-1.051766	0.800605	-1.313714	0.1983
TOT	0.003203	0.039760	0.080559	0.9363
C	6.657510	3.850886	1.728825	0.0935
Selected Model: ARDL (2, 2, 0)				

b) Trend Specification: Case 4/ Case 5

Variable	Coefficient	Std. Error	t-Statistic	P-value
SERV (-1)	0.458957	0.167277	2.743698	0.0100
SERV (-2)	0.226650	0.172142	1.316644	0.1976
REM	-0.360072	0.783342	-0.459661	0.6490
REM (-1)	-0.545208	0.976790	-0.558163	0.5807
REM (-2)	-1.640357	0.783630	-2.093281	0.0446
TOT	0.063873	0.044632	1.431109	0.1624
C	15.46276	5.094131	3.035407	0.0048
@TREND	0.228585	0.093949	2.433080	0.0209
Selected Model: ARDL (2, 2, 0)				

After the ARDL estimation, it is crucial to conduct a comprehensive residuals diagnosis.

Table 70: Diagnostic Test of Residuals

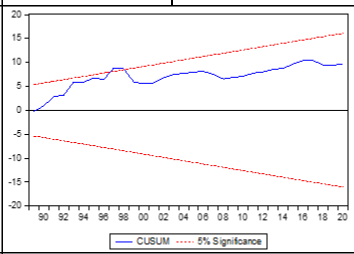
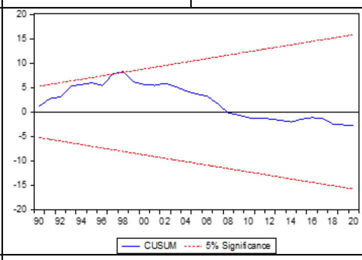
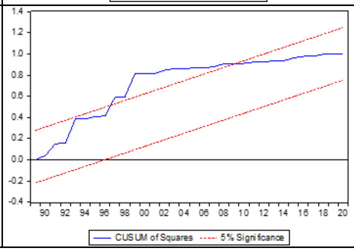
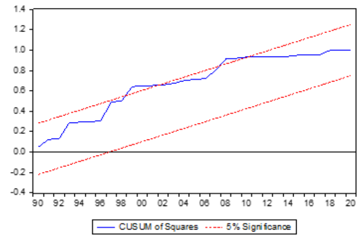
Test	Case 2	Case 3	Case 4	Case 5	Observations
Normality Test	0.147484	0.147484	0.346906	0.346906	Residuals are normally distributed
Serial Correlation LM Test	0.0636	0.0636	0.2438	0.2438	No serial correlation is detected
Heteroskedasticity Test	0.1654	0.1654	0.4263	0.4263	Residuals don't show heteroscedasticity
CUSUM Test					The model indicates stability
CUSUM of Squares Test					The model indicates structural instability in cases 2, 3, 4 and 5

Table 71: The Bounds Test

Significance level	Critical Value							
	Case 2		**Case 3**		**Case 4**		**Case 5**	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
1%	4.13	5	5.15	6.36	4.99	5.85	6.34	7.52
5%	3.1	3.87	3.79	4.85	3.88	4.61	4.87	5.85
10%	2.63	3.35	3.17	4.14	3.38	4.02	4.19	5.06
F-Statistic	2.597933		2.139181		3.331023		4.120881	

The F-statistic values obtained upon conducting the Bounds test in Table 71 (2.597933), (2.139181), (3.331023), and (4.120881) are all lower than the critical value for the lower bound, I (0), at the 10% significance level. This leads to the conclusion that there is no evidence of a cointegrating long-run relationship in the model across all cases (2, 3, 4, and 5). This suggests that the variables under consideration do not move together in the long run. These results eliminate the need to estimate long-run relationship coefficients for all trend specifications.

The Bounds test results rejected the existence of a long-term cointegration between remittances and the services sector in Tunisia across all cases (2, 3, 4, and 5). This suggests that remittances do not significantly influence the services sector over the long term, refuting the study’s hypothesis that the large foreign inflows from workers’ remittances shift resources from the tradeable sector to the non-tradeable sector (services) due to the Resource Allocation Effect. This, in turn, leads to an increase in the services value-added share of GDP. In a nutshell, it is concluded that the remittances are not causing the Dutch Disease in Tunisia.

Table 72: Results' Summary[4]

Dependent Variable	Trend Specification	Independent Variable	Long-Run Coefficient	P-value	Result
ALGERIA					
REER	Case 4 Case 5	OILRENTS TOT RIR	-4.100290 1.432259*** 3.200784	0.2205 0.0000 0.1633	No Dutch Disease Dutch Disease No Dutch Disease
MAN	Case 2 Case 3	OILRENTS TOT RIR	2.070110*** -0.063828 0.866540**	0.0005 0.2367 0.0104	No Dutch Disease (Inconclusive Bounds results)
AGR	Case 2 Case 3	OILRENTS TOT RIR	-0.353188*** 0.010699 0.069908	0.0002 0.1216 0.1236	Dutch Disease No Dutch Disease No Dutch Disease
SER	Case 2 Case 3	OILRENTS TOT RIR	-0.496430 0.049912** 0.334331	0.1570 0.0308 0.1233	No Dutch Disease Dutch Disease No Dutch Disease
SAUDI ARABIA					
Dependent Variable	**Trend Specification**	**Independent Variable**	**Long-Run Coefficient**	**P-value**	**Result**
REER	Case 2 Case 3	OILRENTS TOP	-3.006618*** -541.2965***	0.0000 0.0000	No Dutch Disease No Dutch Disease
MAN	Case 4 Case 5	OILRENTS TOP	-0.049727*** 6.224276**	0.0043 0.0244	Dutch Disease No Dutch Disease
AGR	Case 4 Case 5	OILRENTS TOP	0.031597 23.97873	0.0644 0.0000	No Dutch Disease No Dutch Disease
SER	Case 4 Case 5	OILRENTS TOP	-0.972211*** -58.08295**	0.0000 0.0266	No Dutch Disease No Dutch Disease
MOROCCO					
Dependent Variable	**Trend Specification**	**Independent Variable**	**Long-Run Coefficient**	**P-value**	**Result**
REER	Case 4 Case 5	REM TOT	- -	- -	No Dutch Disease (No cointegration)
MAN	Case 4 Case 5	REM TOT	-0.557354*** 0.048668*	0.0001 0.0541	Dutch Disease No Dutch Disease
AGR	Case 4 Case 5	REM TOT	-0.574142*** -0.010427	0.0005 0.4727	Dutch Disease No Dutch Disease
SER	Case 2 Case 3	REM TOT	- -	- -	No Dutch Disease (No cointegration)
TUNISIA					
Dependent Variable	**Trend Specification**	**Independent Variable**	**Long-Run Coefficient**	**P-value**	**Result**
REER	Case 4 Case 5	REM TOT	80.35590 -3.060414	0.1358 0.2126	No Dutch Disease No Dutch Disease
MAN	Case 2 Case 3	REM TOT	- -	- -	No Dutch Disease (No cointegration)
AGR	Case 4 Case 5	REM TOT	6.857736*** -0.244105***	0.0000 0.0000	No Dutch Disease Dutch Disease
SER	Case 4 Case 5	REM TOT	- -	- -	No Dutch Disease (No cointegration)

* Indicates significance at 10%; ** at 5%; *** at 1%

[4] The Error Correction Term (ECT) coefficients of the models were all found negative, less than 1, and statistically significant as expected.

4.4. Discussion of the Results

4.4.1. Algeria-Saudi Arabia

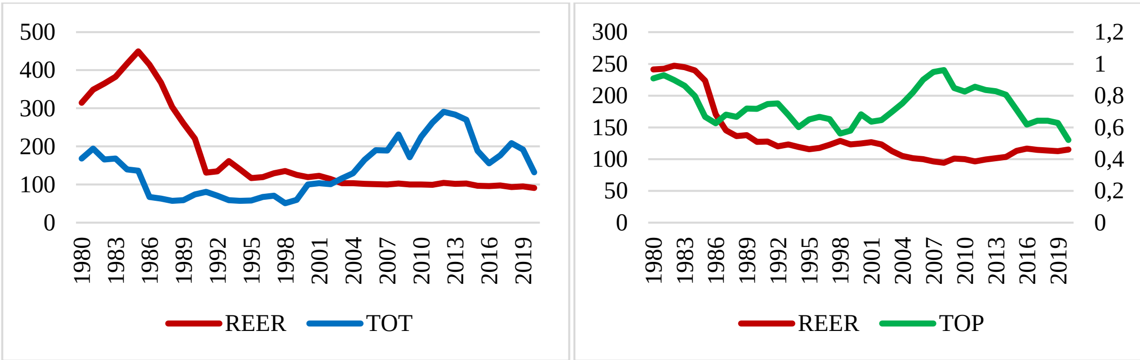
The findings of this study indicate that there is no long-run relationship between the explanatory variables, OILRENTS, RIR, and REER in Algeria. However, the study found a significant impact from TOT. These results partially contradict the initial hypothesis of the study, which posited that oil revenues, terms of trade, and real interest rates would positively affect the real effective exchange rate, ultimately triggering the Spending Effect associated with Dutch Disease. While this divergence from the hypothesis is unexpected, the results align with previous research in the field.

Gasmi and Laourari (2017) conducted an analysis using data from 1960 to 2016 to explore the impact of real oil prices on Algeria's REER. Their findings similarly showed no long-term cointegrating relationship between oil prices and the REER, suggesting that Algeria is not at significant risk of experiencing Dutch Disease. The absence of this long-term relationship implies that fluctuations in oil rents do not exert a persistent influence on the REER in the country, thereby mitigating fears that increased oil revenues would lead to a loss of competitiveness in non-oil sectors via the appreciation of the currency.

The noteworthy importance of TOT as a variable arises from its ability to reflect the relative prices of a country's exports compared to its imports. However, the impact of price volatility in specific product categories on a country's TOT is largely determined by their proportion or weight within the nation's overall trade (Central Bank of Iceland, 2010: 1). In Algeria's case, hydrocarbons, mainly oil, dominate the country's export profile, accounting for approximately 80% of total exports. Therefore, oil prices have a significant influence on the country's TOT (IMF, 2016). This reliance on oil renders Algeria's TOT highly sensitive to shifts in global oil prices, which may explain the significant relationship between TOT and REER observed in the analysis.

This strong dependence on oil revenues also makes Algeria particularly vulnerable to external shocks in the global oil market. When oil prices rise, the terms of trade improve, leading to an inflow of foreign currency and a potential appreciation of the REER. This could have implications for other sectors, potentially distorting the allocation of resources. Conversely, when oil prices fall, terms of trade deteriorate, weakening Algeria's trade balance and potentially causing the REER to depreciate. These fluctuations make the REER more responsive to external market conditions than to domestic factors such as interest rates.

Figure 21: Real Effective Exchange Rate and Terms of Trade in Algeria 1980-2020, and Trade Openness and Real effective Exchange Rate in Saudi Arabia, 1980-2021



a- Algeria **b- Saudi Arabia**

In Algeria, the relationship between TOT and REER is evident from 1980 to 1999, as shown in Figure 21, Panel a. However, after 2002, this correlation seems to dissipate, which can be attributed to a series of significant economic events and policy shifts. The fluctuations in the TOT and REER prior to 2002 were largely influenced by external shocks in the global oil market, but the disconnection after this period points to structural changes in both the domestic and global context.

The oil price boom of the 1970s, triggered by the energy crises, the 1973 oil embargo, the 1979 second oil shock, and the Iraq-Iran War in 1980, had a profound impact on Algeria's economy, heavily reliant on oil exports. The surge in oil prices during these years fuelled substantial inflows of revenue, leading to an improvement in Algeria's TOT and an appreciation of the REER. However, from the early 1980s onwards, global oil prices entered a prolonged period of decline, driven by reduced demand and increased production from emerging oil exporters like Mexico, Venezuela, and Nigeria. This drop culminated in a staggering 60% decrease in oil prices throughout the 1990s.

In Algeria, this sharp decline in oil prices had severe economic consequences. The share of oil rents in GDP plummeted from 31% in 1980 to a mere 6.8% by 1986. Similarly, Saudi Arabia, another oil-dependent economy, saw its oil rents fall from 71% to 22.6% during the same period. This erosion of oil revenues led to a weakening of the TOT, which was mirrored by a depreciation in the REER as Algeria's external economic position deteriorated (World Bank Database, 2023).

From 1980 to 1984, and as a result of a combination of a tight monetary policy and an expansionary fiscal policy in the US, a high long-term interest rate attracted huge capital inflow, the thing that caused a significant appreciation of the US dollar, often referred to as the "Exchange Rate Weapon" (Frankel, 2015: 3). In Algeria, the exchange rate has been pegged to a basket of currencies since 1974, with the US dollar given the largest weight due to its importance in oil exports. The significant appreciation of the US dollar caused a considerable increase in the real value of the Algerian Dinar (DZD) with nearly 50% of its value between 1980 and 1985, which hampered the export and stimulated the imports. In 1986, the Algerian government, faced with a significant decrease in oil rents (which dropped from 31% in 1980 to 6.8% as a share of GDP in 1986), was forced to implement protectionist policies to reduce import bills. The government also heavily relied on external borrowing, with the external debt increasing from 30% in 1984 to a peak of 83.5% of GNI in 1995 (World Bank Database, 2022). In addition to that, in the same year (1986), the Central Bank of Algeria implemented an active exchange rate policy. Following these measures, the Algerian Dinar depreciated by 31% between 1986 and 1988. The Bank of Algeria allowed another depreciation of the Algerian Dinar by 200% between 1989 and 1991. In 1991, the Algerian Dinar was devalued again by 100%.

Between 1991 and 1994, the Algerian Dinar depreciated by an average of 4% annually to reach 24 DZD for 1 USD. In 1995, the managed floated exchange regime was adopted in an attempt to preserve stability in the Algerian Dinar, and in 1996, an interbank foreign exchange market was implemented in order to freely determine the exchange rate. Between 1995 and 1998, the exchange rate appreciated by nearly 20%, to be followed by a depreciation of 13% between 1998 and 2001. As a result, the government reintervened to realign the REER at the 2002 level at an average of 78.7058 DZD for 1 USD (IMF, 2005: 77-78).

However, post-2002, the relationship between TOT and REER in Algeria seems to decouple, in which several factors explain this shift. First, the global oil market experienced a recovery after 2000, but Algeria’s economic policy landscape also changed. The government implemented structural reforms to diversify the economy and diminish reliance on oil revenues. This period also coincided with increased public investment and the implementation of economic stabilisation policies, which could have mitigated the direct impact of TOT changes on the REER in this period. Moreover, Algeria’s growing integration into global trade networks and financial markets may have contributed to insulating the REER from the direct influence of oil price volatility. As the country diversified its trade partners and increased its engagement in international financial markets, other factors such as capital flows and exchange rate management policies likely played a larger role in determining the REER.

Despite the persistent decrease in the value of the Algerian Dinar and the steps undertaken to offset the Spending Effect in Algeria, the rise in oil prices and the improvement in TOT apparently had a significant impact on the REER. Consequentially, TOT is found to be significantly affecting the REER and causing an appreciation of REER and thus a Dutch Disease by the Spending Effect channel.

In the case of Saudi Arabia, the exchange rate policy has played a pivotal role in shaping its economic dynamics, particularly in relation to the REER. The IMF Special Drawing Rights (SDR) have been the peg for the Saudi Riyal (SAR) since 1973. Initially, this policy allowed for some flexibility, pegging the Riyal to a basket of the IMF's currencies with a 7.5% fluctuation margin until mid-1981. However, from 1981 to 1986, the exchange rate policy shifted toward a stricter peg to the US dollar at 3.65 SAR/USD (Alkhareif *et al.*, 2017: 146). This change marked a critical juncture in Saudi Arabia's monetary policy.

In 1986, an important adjustment was made, setting the exchange rate at 3.75 SAR/USD, a rate that has remained unchanged to this day. This decision came in response to the appreciation of the US Dollar during the 1980s, influenced by the "Exchange Rate Weapon" policy of the US government. The strength of the Dollar during that period led to a real appreciation of the Riyal, a situation similar to that faced by Algeria, and in order to mitigate the adverse effects of the Dollar's strength, the Saudi Arabian Monetary Agency (SAMA) moved to a full peg to the US Dollar. Following the correction in the value of the US Dollar in 1986, combined with Saudi Arabia's relatively low domestic inflation, SAMA succeeded in preventing the REER from becoming excessively overvalued (Al-Jasser & Banafe, 1999: 205).

Moreover, the role of trade openness is also found to have a negative impact on the REER in Saudi Arabia. Figure 22, Panel b confirms this finding, illustrating a reverse relationship between trade openness and the REER since 1986. As trade openness increased, the REER depreciated, reflecting the growing integration of Saudi Arabia into global trade networks. This increase in trade openness likely contributed to higher imports, which, along with the diversification of trade partners, weakened the upward pressure on the exchange rate.

These results are particularly significant in that they confirm the absence of Dutch Disease risks, often associated with oil rents and trade openness, on the appreciation of the REER in Saudi Arabia. Instead, both variables have contributed to a more balanced exchange rate, preventing overvaluation. This is a notable divergence from the typical narrative of resource-rich economies experiencing currency appreciation due to natural resource inflows. Saudi Arabia's effective exchange rate management, coupled with prudent monetary policy, have helped stabilise the REER despite its heavy reliance on oil exports.

The impact of oil rents on Algeria's manufacturing sector has been found to be insignificant, a result that challenges the traditional Dutch Disease theory. According to this theory, a boom in natural resources, such as oil rents, typically leads to a contraction in the manufacturing sector. This occurs as increased revenues from the resource sector cause an appreciation in the real exchange rate, making non-resource tradeable goods, including manufactured products, less competitive internationally. However, Algeria's experience contradicts this expectation, suggesting that its economy has unique characteristics that prevent the typical Dutch Disease effects from fully materialising.

Several explanations can account for this discrepancy. Shakeri (2009) and Sierra and Manrique (2014) argue that the severity of Dutch Disease depends significantly on the level of trade openness and the exposure of local industries to foreign competition. In economies with restricted trade, domestic firms often face little competition from abroad, allowing them to dominate the market. This is particularly relevant in Algeria, where the economy has historically been closed to international trade and heavily dominated by the state. Domestic producers can, therefore, set higher prices and benefit from increased demand driven by the resource boom without being undercut by more competitive foreign firms. This protectionist environment insulates the manufacturing sector from the adverse effects typically associated with natural resource booms in more open economies.

Another factor to consider is the structure of consumer preferences in Algeria. The Dutch Disease model assumes that consumers, with increased income from resource wealth, will shift demand toward non-tradeable goods, such as services, at the expense of tradeable goods like manufactured products. However, in Algeria, consumer preferences may not entirely follow this pattern. The Algerian population might still demand domestic manufactured goods, which would help sustain the sector despite the oil boom. This suggests that specific economic and social dynamics within Algeria, such as government subsidies, domestic demand patterns, and limited access to foreign goods, have helped maintain the manufacturing sector's relevance.

In Saudi Arabia, the economic landscape is significantly shaped by the dynamics of oil rents. The substantial annuities provided by the state to its citizens, funded by these oil rents, have led to a unique economic scenario: High prices and diminished work incentives as the state's wealth from oil revenues reduces the necessity for labour income among households. Moreover, the heavy reliance on oil revenues has resulted in a lack of investment in other sectors, such as technology and innovation, which are crucial for long-term economic growth, even, the government's focus on oil has also led to a neglect of education and workforce development, further exacerbating the issue of low labour force participation rates (Lopesciolo *et al.*, 2021). Additionally, the fully pegged currency at a fixed exchange rate makes the relative price of domestic goods extremely high, making them less attractive on the international market. This leads to a decline in the manufacturing sector, or what is called de-industrialisation in Saudi Arabia, in the long run.

Algeria faced de-agriculturalisation as a result of the increase in oil rents from 1980 to 2020. The de-agriculturalisation can be attributed to several factors, with the Resource Movement Effect being the most significant. As oil rents increased, capital and labour were reallocated from the agricultural sector to the booming oil sector, leading to a decline in the agricultural sector's contribution to GDP. This shift of resources can have significant long-term impacts on food security and rural livelihoods. The decline in the agricultural sector was exacerbated by several other factors. First, the lack of investment in agricultural infrastructure and technology led to decreased productivity and competitiveness. Second, climate change has had a significant impact on agricultural production in Algeria. Rising temperatures and changing precipitation patterns have made it more difficult to maintain consistent crop yields. Finally, the government's focus on oil revenues often came at the expense of other sectors, including agriculture (Bouznit *et al.*, 2022).

Despite these challenges, Algeria has made some efforts to address the decline in its agricultural sector. The government has implemented policies aimed at promoting agricultural development and improving food security. These policies include subsidies for farmers, investments in irrigation systems, and programs to encourage the use of modern farming techniques. In 2021, as part of the initiative to strengthen the resilience and sustainability of the agricultural sector in the Arab region, the United Nations Economic and Social Commission for Western Asia [ESCWA] held a national roundtable discussion in Algeria on "Enhancing the Resilience and Sustainability of the Agricultural Sector in Algeria." The discussion focused on identifying strategies to bolster the sector's resilience and sustainability in response to challenges such as climate change, unsustainable resource use, and the impacts of the COVID-19 pandemic (ESCWA, 2021). However, these efforts have been limited in scope and have not been sufficient to reverse the trend of de-agriculturalisation.

In contrast to the commonly observed trend of declining agricultural sectors in resource-rich economies, Saudi Arabia has managed to sustain, and even enhance, its agricultural sector amid increasing oil rents. This finding aligns with Rodriguez (2006), who similarly observed that rising oil rents, rather than diverting resources away from agriculture, contributed to its growth in Saudi Arabia. This phenomenon is mostly attributed to the inclusion of effective government policies aimed at diversifying the economy and reducing its dependence on oil. The Saudi government has implemented strategic investments in agriculture to ensure food security and reduce reliance on food imports. These policies are part of the broader Vision 2030 plan, which aims to diversify the economy and promote sustainable development (Alhumaid, 2023). Additionally, Saudi Arabia has used oil rents to support the agricultural sector through subsidies and investments in modern farming techniques. This approach has helped maintain the viability of the agricultural sector and mitigate the negative effects of resource reallocation.

The analysis of the services sector in both Algeria and Saudi Arabia offers valuable insights into the resource allocation effects of oil rents. Contrary to the expectations of Dutch Disease theory, neither country has experienced an overexpansion of the services sector at the expense of sectors like manufacturing or agriculture. Dutch Disease typically suggests that an influx of resource wealth, such as oil rents, prompts significant growth in non-tradeable sectors (like services), while tradeable sectors (such as manufacturing) contract due to real currency appreciation and resource misallocation. However, this pattern does not fully manifest in Algeria or Saudi Arabia.

These empirical findings align with the descriptive analysis presented in Chapter Two, Figure 14, which shows no clear relationship between oil prices and the services share of GDP in either country. The empirical analysis further reveals that classic Dutch Disease dynamics are largely absent in the MENA region over the period from 1980 to 2020. Specifically, oil rents in Algeria and Saudi Arabia did not significantly impact the services sector during this period. This absence of Dutch Disease symptoms may be attributed to the historical maturity of the services sector in these economies, which had already reached a substantial share of GDP by 1980, potentially mitigating the effects of later oil-based revenue inflows.

However, the role of TOT introduces a different dynamic in Algeria. The fluctuations in TOT, especially due to changes in global oil prices, have impacted the services sector. Specifically, improvements in TOT, which occur when the prices of a country's export (mainly oil in these cases) rise relative to its imports, have contributed to the expansion of the services sector. This occurs through the Resource Movement Effect, where resources are drawn away from tradeable sectors like manufacturing toward the booming resource sector and services. This is more in line with the Dutch Disease theory, though it appears that the effect is less pronounced in these cases, likely due to the aforementioned factors, such as state intervention and economic structure. Moreover, in Saudi Arabia, trade openness is also found to have a significant negative impact on the services sector.

4.4.2. Morocco-Tunisia

Understanding the effectiveness of large inflows of worker remittances is particularly important for countries like Morocco and Tunisia, where remittances play a significant role in their economies. Both countries rely heavily on remittances from citizens working abroad, which have the potential to influence domestic consumption, investment, and economic growth. However, the economic effects of remittances remain a subject of debate, with conflicting views on whether they contribute to poverty reduction or trigger Dutch Disease, a situation where large inflows of foreign currency led to an appreciation of REER, ultimately harming export competitiveness.

Research like Adams (1991) and Adams and Page (2005) propose that remittances can play a critical role in poverty reduction in recipient countries by boosting household income, which in turn supports higher levels of consumption and facilitates investments in education and healthcare. These inflows are often viewed as a buffer against economic shocks, offering a reliable income source that can raise living standards and promote human development.

Conversely, other studies contend that remittances may contribute to Dutch Disease, where an increase in foreign currency inflows strengthens the REER, making a country's exports more expensive and less competitive in global markets. From this perspective, remittances can induce inflation in the non-tradeable goods sector (such as services and real estate) as recipients boost their consumption of domestically produced goods and services, exerting upward pressure on prices. Over time, this dynamic can erode competitiveness in the tradeable goods sector, negatively impacting the country's long-term growth prospects.

However, Barajas *et al.* (2011) offer a more nuanced perspective, arguing that the effects of remittances are contingent on several factors, including the degree of economic openness, resource mobility across sectors, and whether remittances are primarily allocated to the consumption of tradeable or non-tradeable goods. If remittances are directed toward purchasing tradeable goods, this could mitigate the potential adverse effects on the REER, as increased demand for imports may help sustain a balance between domestic and external markets.

In the specific cases of Morocco and Tunisia, the findings regarding the impact of remittances on REER are somewhat surprising and contradict the Dutch Disease hypothesis. In both countries, international remittances were found to have no significant long-term effect on the REER. This suggests that a sustained increase in remittances does not lead to an appreciation of the REER, nor does it undermine the competitiveness of Moroccan and Tunisian exports in the global market.

This result aligns with studies such as those conducted by Brahim *et al.* (2017), which indicate that remittances in the MENA region can actually contribute to a depreciation of the REER rather than an appreciation. Several factors may explain why remittances do not cause an overvaluation of the REER in these two countries. One possible explanation is the policy stance of their governments, particularly regarding exchange rate management. If the authorities maintain an overvalued exchange rate policy, as has been suggested in some studies, this could limit the potential for remittances to appreciate the REER. In such cases, the central bank might intervene in the foreign exchange market to prevent excessive currency appreciation, thereby maintaining export competitiveness.

Another explanation is the pattern of remittance use, if a significant portion of remittances is spent on tradeable goods, such as imported consumer goods, this could mitigate upward pressure on the prices of non-tradeable goods. By boosting demand for imports rather than domestically produced services or real estate, remittances can help maintain balance in the economy and avoid Dutch Disease effects. Moreover, contra-cyclical remittances, where remittances increase during economic downturns, may help to stabilise the economy by compensating for reduced public spending. During periods of economic contraction, remittances can serve as a crucial source of foreign currency that helps to stabilise the balance of payments and supports household consumption. In such cases, remittances could even contribute to a depreciation of the REER, as suggested by Brahim *et al.* (2017), particularly if they are used to sustain consumption of tradeable goods during times of reduced domestic production.

The findings of Addison and Baliamoune-Lutz (2013) further support these conclusions, showing that remittances have a significant negative impact on the REER in Tunisia while having no significant effect in Morocco. Several factors, including differences in their degree of economic openness, contribute to the divergence in outcomes between the two countries. Tunisia, being more open to global markets, might experience greater exchange rate flexibility and resource mobility, allowing remittances to exert a more pronounced influence on the REER. In contrast, Morocco's relatively more controlled economic environment could limit the responsiveness of the REER to changes in remittance inflows.

This study examines whether substantial remittance inflows might induce Dutch Disease, a phenomenon in which large foreign inflows can lead to a decline in tradeable sectors such as manufacturing and agriculture. However, the evidence from Tunisia does not support this concern. Long-term analysis of the relationship between remittances and the manufacturing sector's value-added contribution to GDP shows no significant impact, suggesting that remittances are not causing the resource shifts typically associated with de-industrialisation.

This finding aligns with earlier results regarding the REER, indicating that remittances have no significant effect on Tunisia's REER. The lack of pressure on the REER supports the conclusion that remittances are not undermining the competitiveness of the manufacturing sector.

A key factor contributing to this outcome is the spending patterns of remittance-receiving households. According to Brahim *et al.* (2017), remittances in Tunisia are predominantly directed toward the purchase of tradeable goods, which helps mitigate the risk of resource reallocation toward the non-tradeable sector. This spending behaviour reduces the likelihood of the imbalances typically associated with Dutch Disease. Therefore, the economic impact of remittances in Tunisia appears to depend heavily on how these funds are allocated, with the evidence suggesting that remittances are being directed in ways that support rather than hinder tradeable sectors.

In contrast, Morocco exhibits a clearer instance of Dutch Disease effects attributable to remittances. Over time, the increased flow of remittances has had a detrimental impact on the manufacturing sector's value-added share of GDP, indicating a shift of resources from manufacturing to non-tradeable sectors, leading to de-industrialisation. This pattern aligns with traditional Dutch Disease theory, where foreign currency inflows undermine competitive sectors by drawing resources away from them.

The agricultural sector in Morocco has also experienced significant negative effects from both remittances and migration. According to Rudel *et al.* (2005), as rural workers migrate abroad or to urban areas in search of higher-paying jobs, the agricultural workforce shrinks, leading to rising wages for the remaining workers and making agricultural production less profitable, and forcing farmers to abandon these less productive businesses. This pattern of labour migration away from farming is specifically common in Morocco. Historical data further supports this claim, since between 1960 and 1974, 85% of Moroccan migrants came from rural areas (Bencherifa, 1991), and by 2020, about one-tenth of Morocco's 33 million population was living abroad (Berriane *et al.,* 2021). This mass migration has drained the agricultural sector of its primary labour force, weakening its economic contribution.

Moreover, remittances sent back to Morocco have not been reinvested to strengthen agriculture or enhance productivity. Instead, remittance-receiving households tend to allocate these funds toward non-productive areas, such as real estate or consumer goods. McMurray (1992) found that returning Moroccan migrants often prefer to invest in small businesses like cafés and restaurants rather than in agriculture. This pattern of "non-productive" investment sheds light on why remittances have not spurred long-term growth in Morocco's agricultural sector. Even when investments are made in agriculture, they are often sentimental rather than profit-driven, resulting in "hobby farming," which is typically less productive and profitable.

Tunisia, while sharing some economic characteristics with Morocco, has experienced a markedly different outcome in the agricultural sector. Although remittances can reduce the labour supply by providing income that substitutes for work, as Habib (2023) notes, agriculture remains a key focus of investment for Tunisian expatriates. Zuccotti (2018) has found that one-third of Tunisian expatriates' own businesses in Tunisia, and remarkably, two-thirds of these ventures are in agriculture. Many Tunisian expatriates express a strong desire to invest in agriculture upon their return, with 39% of those in Italy reporting plans to reinvest in farming when they come back to their homeland. This preference for agricultural investment has significantly contributed to the sector's resilience in Tunisia.

Empirical evidence supports this observation as shown in Table 72. These findings directly challenge the Dutch Disease hypothesis, which suggests that large foreign inflows lead to a reallocation of resources from tradeable sectors like agriculture and manufacturing to non-tradeable sectors, such as services. In Tunisia's case, remittances have not caused a decline in agricultural activity or value-added, but rather have bolstered agricultural investments, enhancing the sector's contribution to the economy.

The contrasting experiences of Tunisia and Morocco highlight how remittances can have varying effects on different sectors, depending on how they are spent and the broader economic context. In Tunisia, remittances have not only avoided triggering Dutch Disease, but have also played a key role in sustaining the agricultural sector. The case of Tunisia suggests that when remittances are invested productively, they can stimulate economic growth and enhance the value-added contributions of critical sectors like agriculture.

The broader implications of these findings underscore the importance of remittance utilisation in shaping economic outcomes. In many countries, remittances are allocated to a range of needs, from household consumption and education to construction and investment in small businesses. The allocation of these funds can either support or undermine various sectors, influencing the overall economic structure. Perez-Saiz *et al.* (2019) emphasise that changes in one sector can have significant spillover effects on others. In Tunisia's case, the stable inflow of remittances has not led to an increased demand for non-tradeable goods, allowing the country's economic structure to remain balanced and the impact on the services sector to remain minimal.

Remittances were found to have no significant impact on the services sector in both Morocco and Tunisia. This result contrasts with the classical Dutch Disease hypothesis, which suggests that large inflows of foreign currency, such as remittances, typically lead to an expansion in the non-tradeable sector (like services) at the expense of tradeable sectors (manufacturing and agriculture). In this case, however, the services sector in both countries remained largely unaffected by remittances, and this finding offers critical insights into the broader economic dynamics in these nations. To understand this outcome, it is important to consider the earlier results regarding the impact of remittances on the REER, manufacturing, and agriculture. In Tunisia, the absence of a significant effect of remittances on the REER, combined with the absence of de-industrialisation, and absence of de-agriculturalisation, suggests that remittances have not caused the typical exchange rate pressures that could lead to a shift in resources toward non-tradeable sectors like services. As the real exchange rate remained relatively stable, remittances did not create the economic conditions (higher demand for non-tradeable goods and services and higher prices for domestic goods) that would trigger an expansion in the services sector.

Furthermore, the stability of the services sector can also be linked to the relatively low impact of remittances on agriculture. In Tunisia, remittances were directed toward agriculture in productive ways, boosting the sector’s value-added contribution to GDP. As a result, there was no substantial resource shift from agriculture to services. Instead, remittances bolstered agricultural investments, especially among expatriates, and this kept the structure of the economy balanced without significant shifts toward the services sector.

The same pattern is observed in Morocco, where remittances negatively affected the manufacturing and agricultural sectors, leading to de-industrialisation and de-agculturalisation, but still had no impact on the services sector. This can be explained by the nature of remittance spending in Morocco. Instead of significantly boosting demand for services, remittances were primarily used for non-productive investments such as real estate or small businesses like cafés and restaurants. McMurray (1992) has highlighted that majority of Moroccan migrants preferred to invest in less productive, small-scale ventures upon their return, such as real estate or small retail businesses, which did not generate the level of demand or employment typically associated with a thriving services sector. These investments did not generate the kind of broad economic demand that would lead to substantial growth in the services sector.

CONCLUSION and RECOMMENDATIONS

The Dutch Disease is a well-documented economic phenomenon that arises from a sudden surge in resource revenues, such as oil windfalls, leading to adverse effects on a country's tradeable goods sector. This phenomenon typically manifests through two key mechanisms: The appreciation of the real exchange rate, which reduces the competitiveness of the tradeable sector (Spending Effect), and the shift of resources away from productive industries like manufacturing and agriculture (Resource Movement Effect). The consequences are often seen in de-industrialisation, de-agriculturalisation, and reduced long-term economic diversification. The aim of this study is to examine the extent to which Dutch Disease affects countries in the MENA region, focusing on both oil-rich and oil-poor economies, and to analyse the channels through which these effects occur via the ARDL approach for the period of 1980-2020.

The findings of this study confirm the presence of some of the Dutch Disease symptoms in oil-rich MENA countries, with varying degrees of impact across sectors. The ARDL results reveal that oil rents did not significantly impact the real effective exchange rate in the long term for both Algeria and Saudi Arabia. This suggests that exchange rate appreciation due to oil windfalls is not a major issue in these countries.

Algeria's manufacturing sector demonstrated resilience, remaining relatively unaffected by the negative effects of oil rents. This could be attributed to factors such as diversification efforts, consumer behaviour, or other structural conditions. However, the agricultural sector in Algeria was significantly impacted, with oil revenues driving labour away from agriculture, leading to de-agriculturalisation. This outcome highlights the vulnerability of the agricultural sector to shifts in labour allocation due to resource windfalls, which threatens food security and rural livelihoods. In contrast, Saudi Arabia experienced more pronounced symptoms of Dutch Disease, particularly in its manufacturing sector. The results indicate that oil rents contributed to a decline in manufacturing activity, signalling de-industrialisation. Despite these effects, Saudi Arabia's agricultural sector not only remained immune to oil windfalls, but also oil rents contributed to the expansion of the sector over time, a divergence from Algeria's experience. This resilience could be attributed to specific government policies, subsidies, and the unique nature of Saudi Arabia's agricultural sector.

Regarding the services sector, both Algeria and Saudi Arabia witnessed limited effects from oil rents. Despite the inflow of oil revenues, and the shrink of some tradeable sectors in both countries, the services sector did not disproportionately expand or absorb labour at the expense of other sectors, suggesting that the services sector remained isolated from the broader dynamics of rent-driven structural shifts.

Concerning the oil-poor countries, the findings for Morocco and Tunisia suggest that while these nations did not suffer from real effective exchange rate appreciation due to remittance inflows, the impact on their economic sectors varied. In Morocco, remittances led to both de-industrialisation and de-agriculturalisation, indicating that foreign inflows biased labour and investment from the sectors, thus weakening the industrial and agricultural bases. Tunisia, on the other hand, showed more resilience, with remittances having a neutral effect on both the manufacturing and agricultural sectors in the long term. In both countries, the services sector did not disproportionately expand, further underscoring the complex dynamics of resource and remittance inflows in shaping sectoral outcomes.

These results highlight the multifaceted nature of Dutch Disease in the MENA region, with its effects contingent on each country's specific economic structure, policy environment, and external factors. While oil-rich countries like Algeria and Saudi Arabia exhibit symptoms of the disease, oil-poor countries like Morocco and Tunisia face similar sectoral challenges due to remittances, though the magnitude and channels of impact differ. In this regard, given the significant impact of Dutch Disease on MENA economies, particularly on the tradeable goods sectors, it is imperative that these nations pursue diversification strategies to reduce their dependence on oil revenues or remittances. Over-reliance on a single revenue source, whether natural resources or remittances, makes these economies vulnerable to external shocks and limits sustainable growth prospects.

For oil-rich countries like Algeria and Saudi Arabia, promoting industrial competitiveness and enhancing agricultural productivity should be prioritised. Policies aimed at supporting sustainable agriculture, fostering innovation in manufacturing, and investing in human capital will help buffer these sectors from the negative effects of resource windfalls. Structural reforms that encourage private sector investment and reduce the economy's dependence on government spending from resource revenues are also crucial.

In the case of oil-poor countries such as Morocco and Tunisia, remittances play a critical role in economic stability, but they also bring unintended consequences. Policymakers should channel remittance inflows toward productive investments in the industrial and agricultural sectors to prevent further sectoral declines. Furthermore, targeted policies that address labour market inefficiencies and promote entrepreneurship can help mitigate the potential adverse effects of remittances on sectoral reallocation.

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CURRICULUM VITAE

He completed his undergraduate studies in 2010 at the University of Constantine, Abd El Hamid Mehri, Faculty of Economic and Management Sciences, Department of Management Sciences. In 2018, he earned his Master’s Degree in International Trade and Policy at Ajou University, Graduate School of International Studies in South Korea, supported by the Korea International Cooperation Agency Scholarship. He began his doctorate program in Economics at Karadeniz Technical University, Institute of Social Sciences, Department of Economics, in 2019, as a recipient of the prestigious Türkiye Scholarships.

AIMAR is single and speaks Arabic, English, Turkish, and French.