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Thesis: Rentier states in the MENA region and the impact of energy transition

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Catalog

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Abbreviations

AREP = Algeria's Renewable Energy Program

AAU = Assigned Amount Units

BTI = Bertelsmann Stiftung's Transformation Index

CH4 = Methane

COP = Conference of the Parties

CO2 = Carbon Dioxide

COVID = Coronavirus Disease

ETEM = Energy Technology Environment Model

ERU = Emission Reduction Units

EU = European Union

FIFA = International Federation of Association Football

GCAM-PR = Global Change Assessment Model

GDP = Gross Domestic Product

GEMINI-E3 = General Equilibrium Model of International-National Interactions between Economy, Energy and the Environment

GHG = GreenHouse Gas

GW = Gigawatt

HFCs = Hydrofluorocarbons

IAM = Integration Assessment Models

IEA = International Energy Agency

IMF = International Monetary Fund

INDC = Intended National Determined Contribution

IPE = International Political Economy

IRENA = International Renewable Energy Agency

IRT = International Relations Theory

LCOE= Levelized Cost of Energy

LEDS = Low-Emissions Development Strategies

LT-LEDS = Long-Term Low Greenhouse Gas Emissions

MENA = Middle East and North Africa

MUSE = ModUlar energy systems Simulation Environment

MW = Megawatt

NDC = National Determined Contribution

NDC_LTT= National Determined Contribution Long Terma Target

N2O = Nitrous oxide

OECD = Organisation for Economic Cooperation and Development

OPEC = Organisation of the Petroleum Exportin Countries

PFCs = Perfluorocarbon

PV =Photovoltaic

RES = Renewable Energy Resource

RST = Rentier State Theory

Tiam-Grantham = Times Integrated Assessment Model (of the Grantham Institute)

TJ = TeraJoule

Toe = Tone of oil equivalent

SFCs = Sulphur hexafluoride

UAE = United Arab Emirates

UNFCCC = United Nations Framework Convention on Climate Change

USA = United States of America

Chapter 1: Introduction

1.1 Introduction

The Rentier State Theory (RST) has long captivated analysts and scholars in the field of International Political Economy (IPE). This theory, which primarily examines countries in the Middle East and North Africa (MENA), addresses the pressing question of why these states, despite their abundant energy resources, do not exhibit significant economic growth. As I will explore in the theoretical section, these countries tend to focus on exporting energy resources and the income generated from these exports, rather than on fostering and diversifying various economic sectors. This raises critical questions about how these states will adapt to the new challenges posed by energy transition.

1.2 Aim, Methodology, Structure and Contribution of the Thesis

The aim of this thesis is to examine how these states will either embrace or resist the energy transition and the low-carbon policies that reflect emerging global trends.

In this analysis, I aim to address the following questions

1) Are Qatar and Algeria classified as rentier states, and what factors contribute to this classification?
2) How are these countries adapting to the energy transition?

To achieve this goal, the thesis will draw upon literature from scientific journals, articles and data from international economic organizations, to provide a comprehensive macroeconomic analysis, along with an exploration of the Rentier State Theory (RST) and energy transition. This analysis will highlight how these concepts can be implemented in the selected states. This thesis aims to foster a new dialogue regarding the economies of MENA countries, particularly in relation to their responses to energy transition and the measures imposed by the international community to address issues like the climate change. Additionally, this thesis will encompass both theoretical and quantitative analyses, providing an in-depth examination of the core themes.

The structure of the thesis is the following:

In the first chapter, I will outline the rationale behind writing this thesis, detailing its objectives, methodology, structure, and its contribution to the literature on Rentier State Theory.

In the second chapter, I will delve into the theoretical framework of International Political Economy and Rentier State Theory, providing a foundational understanding what will inform the subsequent case study analyses.

In the third chapter, I will explain the macroeconomic theory that will be used in this discussion.

In the fourth chapter, I will explore the pathways and perceptions of energy transition. This section will present key concepts and objectives associated with energy transition, serving as the second essential theoretical background for the case study analysis.

In the fifth chapter, I will give a brief description of the cultural, geographical, economical and energy profile of MENA region, as a basis to the examination of Qatar's and Algeria's case studies.

The sixth chapter will focus on Qatar. Here, I will provide an in-depth analysis of Qatar's economy, emphasizing macroeconomic data. I will examine the country's energy profile, including its energy mix, production, consumption, trade, and energy poverty. Additionally, I will assess whether Qatar qualifies as a rentier state, by calculating its rent as a percentage of government revenues. I will also investigate whether it adheres to the 'rules' of Rentier State Theory through an examination of energy subsidies, the labor market, and the political landscape. Finally, I will evaluate the country's efforts to adapt to energy transition.

In the seventh chapter, I will shift the focus on Algeria. Similar to the previous chapter, I will analyze the Algerian economy with an emphasis on macroeconomic data. The energy profile of Algeria will be explored, including its energy mix, production, consumption, trade, and energy poverty. I will determine if Algeria constitutes a rentier state, by calculating its rent as a percentage of government revenues, and I will assess its compliance with the principles of Rentier State Theory through an analysis of energy subsidies, the labor force, and the political situation. Finally, I will evaluate Algeria's initiatives toward adapting to energy transition.

In the eighth chapter, I will compare the two states to identify similarities and differences in their characteristics as rentier states and in their approaches to adapting to energy transition.

In the ninth chapter, I will conclude the thesis by summarizing the analyses presented in previous chapters and proposing questions for further study.

Chapter 2: Rentier State Theory, under the prism of International Political Economy

2.1 Introduction

The MENA region is a region with important energy interests, because the countries that make it up are important oil producers. Despite the significant power that these countries have in the energy sector, they present slow economic growth. This phenomenon is described through the theory of International Political Economy (IPE) and, more specifically, the Rentier State Theory (RST). In this chapter I will analyze these two theories, expounding the most important aspects that have been made.

2.2 International Political Economy

2.2.1 Introduction

The field of International Political Economy is a field that combines two opposite sciences, economics and politics. It examines how economic systems can influence the politics of regimes and vice versa. This science gives a multifaceted and interdisciplinary interpretation of the ways by which states operate.

2.2.2 The theoretical context of International Political Economy

In order to analyze the Rentier State Theory (RST), it is vital to mention that RST is a theoretical construct within the wider context of International Political Economy. As Oatley (2019, pp.25) has stressed *‘’International political economy (IPE) is the study of how politics shapes the global economy and how the global economy’’ shapes politics’’.* So, via IPE studies, it has emerged that policy and economy are two sciences that impact each other. The truth is that the economic power and stability of a state can determine its political stability and the opposite. Thus, there is a prominent interdependence between policy and economy. According to another definition, given by John Ravenhill (2018, pp.20) *‘’ International political economy is a field of enquiry a subject matter whose central focus is the interrelationship between public and private power in the allocation of scarce resources’’.* In order to understand this definition, it is important to clarify that, on the one hand, the ‘’allocation of scarce resources’’ is the biggest problem that the economic science try to solve (Giannelis et al., 2014). On the other hand, I should explain the essence of the word ‘’power’’. Hence, power is considered the ability to change someone’s behavior, and to set agendas and rules in the international political system (Hancock et al., 2014). Therefore, the role of ‘’power’’, both public and private, in the distribution of resources is crucial and

expresses the interference of policy in the field of economy. Undrerhill (2001, p.3) tried to conceptualize the field of International Political Economy by setting three assumptions:

a) *the political and economic domains cannot be separated in any real sense, and even doing so for analytical purposes has its perils,*
b) *political interaction is one of the principal means through which the economic structures of the market are established and in turn transformed and*
c) *there is an intimate connection between the domestic and international levels of analysis, and the two cannot meaningfully be separated off from one another.*

Via this conceptualization, Underhill highlights the connection between policy and economy and the linkage between two of the levels of international relations analysis: the national and the international. This means that whatever happens on the one can influence the other.

The theory of International Political Economy was born in the 1970s, and there were two circumstances which led to its creation. The first is the end of fixed exchange rates. On 1971, Richard Nixon, president of the USA, decided to devaluate the USA dollar and curtail the ‘’gold exchange standard’’ period which started from the establishment of Bretton Woods system. The second circumstance was the energy crisis, caused by the OPEC’s embargo imposed to the Western states, which supported Israel in the war of Yom Kippur in 1973 (Gray, 2011).

2.2.3 The school of thoughts of the IPE

In analyzing the International Political Economy, three important approaches are used. These approaches originate from International Relations Theory (IRT), on which International Political Economy is grounded in.

The first approach is realism. Realism is based on two assumptions: first one is that people are selfish and competitive, and these characteristics are involved in the human nature. Second one is that the transnational system operates in the context of international anarchy (Heywood, 2013). To fully comprehend realism, two more significant elements must be considered. First one is that because of anarchy, states try to survive on their own (self-help). Second one is that the acquisition of power from

some states creates security dilemmas (Platias, 2010). So, there is no superior authority beyond the sovereign state which can control the state's behavior. Realism has undergone an important evolution, which is divided into three forms. The first form is classical realism, which gives emphasis to human nature and behavior, which is inherently violent. Moreover, it attempts to find the connection between power and morality in the international system (Baylis et al., 2013). Thucydides was the first scholar who supported these ideas, through the description of the Peloponnesian War, between Sparta and Athens. The case of Thucydides is particularly significant because he does not only lay the groundwork for classical realism, but also for the structural realism or neo-realism. Machiavelli via his book ''The Prince'' and Morgenthau, via his book ''Politics Among Nations'', were also important supporters of this form (Baylis et al., 2013). The second form of realism is neo-realism or structural realism. This form does not focus on human nature but on the role of the state in the international system (Baylis et al., 2013). Neo-realists underline that the system is anarchical. They also define power as the concentration of resources within a state and its capability to coerce other states. Two of the schools of thoughts of neo-realism are the defensive realism of Kenneth Waltz and the offensive realism of John Mearsheimer (Baylis et al., 2013). According to the first type of realism, states are not aggressive, but they follow moderate policies to survive in the international system. Offensive realism presents states as competitive and expansionist because they want to gain strength (Baylis et al., 2013). The third form of realism is neoclassical realism, which constitutes a synthesis of the two previous forms. Zacaria tried to achieve this linkage through its book ''From Wealth to Power'' (Baylis et al., 2013)

As Roukanas (2007) points out, the contribution of realism to International Political Economy is crucial. On the one hand, the role of the state is important for understanding the formation of political economy and decision-making in this sector. On the other hand, security issues are linked with economic relations and prove that the latter are fragile.

In terms of the field of International Political Economy of Energy, realism underlines that states must use energy as means of power in order to achieve their goals. So, energy is regarded as a weapon. The example of Russia, which tries to exercise its power through Ukraine via its pipelines is indicative (Hancock et al., 2014).

The second approach of International Relations Theory is liberalism. Liberalism promotes the cooperation between states and is based on the ideas of the period of the Enlightenment and, to be more specific, the theory of Kant for a ‘’perpetual peace’’ in the world (Heywood, 2013; Mershaimer, 2001). So, the theory of liberalism supports the harmonization of conflicting interests between the states. The study of liberalism is divided in three theories, the first of which is the ‘’democratic peace’’. This theory underlines that states must be democratic, because democracies do not fight each other; instead, they cooperate. The second theory is that of ‘economic interdependence’. Thus, if states trade with each other, then they will understand that it is more profitable to cooperate with other states and more costly to fight with them. The third theory is ‘’institutionalism’’, according to which global institutions will play a crucial role in controlling the international system so as to bring stability (Heywood, 2013). Three are the periods of the history of liberalism. The first is the period of Enlightenment, during which Kant became the leading proponent of the theory. The second is the interwar period (1919-1939), during which Woodrow Wilson, president of the USA, supported the cooperation between states, through its ‘’14 points’’ (Baylis et al., 2013). In this period liberalism was defined as ‘’idealism’’. The span from 1945 to the present is the third phase, during which neo-liberalism emerged. The theories of democratic peace and economic interdependence had already rose in the two first periods. However, they were developed importantly in the third period, on which the institutionalism appeared.

According to Roukanas (2007), liberalism has significantly contributed to the IPE. As he supports, liberalism has focused on the role of technology as a way of addressing economic inequalities. He also argues that liberalism promotes the establishment of the market mechanism and the economic exchanges between states. Finally, he stresses that, like realism, liberalism highlights the importance of capitalism as the most suitable economic system for the development of states.

In the field of International Political Economy of Energy, liberalism emphasizes that states must allow the market to operate freely, and, on the other hand, private companies must participate dynamically in the market. Neo-liberalism underlines the role of organizations in international politics of energy, such as OPEC (Hancock et al., 2014).

The third approach is the critical theories. As Heywood (2013, pp. 137-151) describes, these theories are:

a) *Marxism, the neo-Marxism and the critical theory, which focus on the economic, ideologic and cultural dimension of oppression,*
b) *Social constructivism, which is based on the belief that there is no objective social political reality independent of our own perception of it,*
c) *Poststructuralism, which emphasizes that all ideas and concepts are expressed through language embedded in complex power relations,*
d) *Feminism, which promotes equality between the two genders,*
e) *Green politics, which prioritizes ecological politics and the notion that there is an inherent connection between humanity and nature and*
f) *Postcolonialism, which attempts to reveal the cultural dimension of colonial power mainly through the legitimization of non-western and -sometimes- contradictory ideas of cultures and traditions*

Special mention should be made of another theory within the context of critical theory, namely historical structuralism, which is related to the theory of marxism, the theory of global systems, the theory of interdependence and Gramsian analysis (Roukanas, 2007). This theory propounds the historical evolution of the changes that have occurred in the economic and political system (Roukanas, 2007).

The theories I mentioned so far, resent some common points. Firstly, most of them accept the existence of post-positivism, which supports the connection of object and subject. So, the theory services some goals, as Robert Cox (1981) has underlined. The second common point among these theories is that they try to question the values and the rules of the world order. Finally, they are committed to the liberation of the individual from oppression, and they defend the interests of the weaker groups (Heywood, 2013).

According to Roukanas (2007), historical structuralism has developed three ideas about the International Political Economy. The first idea is the implementation of the capitalist economic system, which is responsible for the current conditions prevailing in the international political scene. The second idea is that these conditions are greatly influenced by the way in which the social classes are structured. The third idea supports that, while capitalism as a system has several negative aspects, it also promotes the

creation of a world where the majority of society will have the power and will manage to express its demands.

In the field of International Political Economy of Energy, historical structuralism focuses on ideas such as the value of energy, and the most effective energy forms, among other considerations.

2.2.4 Conclusion

The field of International Political Economy has been interpreted in many and different ways by many analysts. As it was observed, each school of thought examined from its own point of view the dependence between the two fields. Thus, through the different conclusions, the multifaceted nature of international political economy emerged.

2.3 Rentier State Theory

2.3.1 Introduction

Rentier State Theory is a theory that combines politics and economy. This will be understood through the analysis, as I will examine both the economy of these countries and more specifically, I will talk about not only the energy subsidies and the labor market, but also the political situation of these states. But, first of all, I will mention the theoretical framework of the theory and in the final, I will cite the criticism that has been made about the theory.

2.3.2 Theoretical analysis and terminology of the Rentier State Theory

Before analyzing the content of the Rentier State Theory, it is important to expand on the concept of ‘rent’, since numerous definitions have been provided by economists so far. According to Riccardo (1817), rent is the reward given to a state, because of the ownership of natural resources, which Marshall (1920) refers as ‘’gift of nature’’. So, the possession of resources from a state is beneficial for it. According to Smith (1960), rent does not constitute the same type of income as wages and profits. As he supports, rent plays a significant role in the determination of the price of the commodities. This pursuit of rent (which lead to a rent-seeking attitude) is the basic characteristic of the category of states that I am going to analyze: the rentier states.

As regard RST, Madhavy was the first analyst and founder of this theory. According to Madhavy (1970), rentier states are defined as countries which receive a significant amount of external rent from other countries. So, Madhavy makes an important observation according to which this rent doesn’t arise from domestic production, but

comes from foreign governments. This dependence from the external rent is the essential point of the theory.

Beblawi (1987), who is one of the basic key proponents and analysts of this theory has expanded upon Madhavy's theory and has used four elements to define rentier states. The first one is the dominance of the rent in the economy, which means that these states focus on the pursuit of rent for their existence. The second element is that this rent is external, which is exactly what Madhavy wished to stress through his definition of rent. Domestic production is not reinforced and, thus, the states do not generate much internal revenues, and, instead, rely on external rent. The third element is that the government is the direct recipient of the rent, which means that the rent is controlled and therein allocated by the elite of the state. These characteristics, according to Beblawi, compose the way the rentier states think and act. This behavior is called as ''rentier mentality''. The reliance of rentier states on external rent led to another way of rent generations, which is called as ''second order rent''. Two specific areas are involved in this category: real estate and stock market or financial speculation.

As it is clear, there is an important paradox, which is called as ''paradox of plenty''. This term has been used by many economists to explain that despite their expectations that countries with abundant natural resources are wealthy, they observe that their economies present a really slow growth (Özyavuz et al., 2015).

Rentierism is often confused with the natural resource dependency. Herb mentions the difference between the two theories. According to Herb (2005 pp.298), *''Natural resource dependency is measured as the share of natural resource exports as a percentage of GDP. Rentierism, by contrast, is measured by the percentage of rents in government revenues''.* So, the difference between the terms is based on the way they are measured. Moreover, according Luciani (1987), if rent percentage is more than 40%, the state is rentier.

Özyavuz et al. (2015) stress that many analysts used a sociological theory in order to examine the Rentier State Theory. This was the theory of neopatrimonialism. According to this theory *''Neopatrimonialism is the vertical distribution of resources that gave rise to patron-client networks based around a powerful individual or party''* (Moti, 2019, pp.11). It is true that this theory shares many common elements with both

the clientelist and the patrimonial categories of rentier states, which will be analysed later.

2.3.3 Emergence of the Rentier State Theory

The theory of rentier state emerged as a theory in the 1970s. This decade is an important one for the energy security history, because of the outburst of two significant oil crises The first ‘’oil boom’’ was caused by the oil embargo that Iran and other Arab countries imposed on the USA and other countries which supported Israel in the Arab-Israeli War of 1973. The second crisis is linked with the war between Iran and Iraq, between 1980-88, because of the 1978-79 Iranian revolution. These two events played a crucial role in the creation and development of the Rentier State Theory, focusing economists’ attention on the examination of oil-states (Gray, 2011).

2.3.4 Rentier State Theory, Resource Curse Theory, Dutch Disease Theory: Similarities and Differences

Rentier State Theory is an important theory of the political economy of energy which examines states possessing energy resources. However, it is not the only theory. In the field of International Political Economy studies, there are two other significant theories, which follow more or less the same logic with rentierism: the resource curse theory and the Dutch Disease. Hence, it is necessary to examine the similarities and the differences of these theories, as well.

According to Roukanas (2015, pp. 50) resource curse is a phenomenon which refers to *‘’a national economy with plentiful resources — e.g., oil and gas in the case of Russia — that has lower GDP growth and longterm low development in relation to a national economy with fewer resources’’*. This paradox has been characterized by Ross (2013) as ‘’perverse effects’’ of the resource curse. So, although a country may own an abundance of resources, its economy will move on slowly. The term ‘’resource curse’’ was coined by Richard Auty in 1993 in his article ‘’ Sustaining Development in Mineral Economies: The Resource Curse Thesis’’. The debate for the causes of the resource curse started in the 1950s. However, efforts of analyzing this phenomenon were hard because of a lack of data (Roukanas, 2015). The economists, who supported the structuralist school of thought and tried to examine the resource curse, focused on those countries, where the majority of exports consists of natural resources, which seems to decline in terms of trade (Ross, 1999). The researchers also concluded that countries dependent on natural resources exports were also vulnerable to the fluctuation of the

prices. Three are the reasons why this occured: *a) restriction of private investments, b) limitation of government revenues, and c) limitation of foreign exchange* (Ross, 1999, pp. 301). Finally, economists stressed that the dominant role of multinational companies in resource extraction and repatriation of the revenues impeded the strengthening of the national economy from natural resources. Since 1970, the effort to find a linkage between exploitation of natural resources and economic growth has become very difficult. Hence, the resource curse concept is the ‘’shorthand’’, via which analysts can manage to address the political and economic problems that exist in countries with abundant resources (Barma, 2014).

The second theory is the Dutch Disease. The term was first used in the Journal ‘’The Economist’’ in 1977, and described a phenomenon that was observed in the Netherlands. It was in the 1960s when the Netherlands discovered gas reserves in the North Sea. Since then, the country has faced numerous problems, such as unemployment, which increased around 4% between 1970 and 1977 from 1.1% to 5.1%, whereas private investment in the country decreased. This unfortunate event took place, because the Netherlands received some capital from the export of gas to other countries. In this way foreign currency entered the country. This foreign currency was converted into local currency, but it was not spent on goods tradable with other countries; instead, this extra foreign currency created domestic demand. As a result, the local currency was appreciated and became more expensive, while the domestic prices rose, thus decreasing the competitiveness of the economy (The Economist, 2014). To conclude with the Dutch Disease, there were two effects that resulted this phenomenon. The first one is the spending effect, according to which the augmenting domestic income, which induced higher demand, increased spending from both the private and the public sector. The demand became high particularly for the non-tradable goods and the prices of these goods rose by leading to the increase of wages and the decrease of profits for the non-tradable sectors. The second effect is the resource movement effect, according to which labor and capital moved to the natural resource sector, by creating serious problems in the whole domestic production (Brahmbhatt et al., 2010)

The common point between the three theories is that the possession of natural resources from a country does not necessarily cause significant economic growth. But each theory focuses on different consequences. The Rentier State Theory gives emphasis to the

external rent on which the natural resources export-oriented countries are dependent, whereas they do not diversify their economies into other sectors. The Dutch Disease theory focuses on the effects of foreign capital influx from natural resource exports, which lead to a more expensive currency. Finally, the resource curse theory claims that despite the possession of plentiful resources, a country may present slow economic growth.

2.3.5 Categorization of rentier states

Barma (2014) developed an important typology, as it is shown in the Figure 1 in order to categorize Rentier states according to two dimensions: credibility of intertemporal commitment and political inclusiveness. The credible intertemporal commitment refers to the enforcement of political stability and the imposition of sanction on anyone who violates this stability.

Figure 1: The categorization of rentier states

	Less intertemporal commitment	**More intertemporal commitment**
Less political inclusiveness	**Patrimonial rentier state** Rent generation low; rent distribution dominated by concentrated elites	**Hegemonic rentier state** Productive rent generation; Rent distributed among small elite
More political inclusiveness	**Clientlist rentier state** Rent generation relatively low; rent distribution benefits client networks	**Pluralist rentier state** Rent generation and distribution provide sustainably collective goods and services

Source: Barma, N. H. (2014). The Rentier State at Work: Comparative Experiences of the Resource Curse in East Asia and the Pacific.

Political inclusiveness refers to the state's commitment to respecting each and every population group and their incorporation in the decision-making processes. So, Barma created a 2x2 matrix table, with the use of these two dimensions. As it is observable from this table, if a rentier state presents less credible intertemporal commitment and less political inclusiveness, then it is considered a patrimonial rentier state. In these states, the rent generation is low, which means that they are dependent on the external

rent they receive from other countries. Moreover, the external rent allocation is concentrated in the hands of elite groups. The next category is that of the clientlist rentier states. These states have less political stability, but stronger political inclusiveness. Therefore, while the rent production is low, as in the patrimonial states, the external rent benefits the client networks, rather than the elites. The third category contains the hegemonic rentier states. In this category, the states present important political stability, but less political inclusiveness. In other words, the hegemonic states do not rely on the external rent, because they produce their own rent. Nevertheless, the rent is allocated among the elites. The last category is that of the pluralist rentier states. These states are both politically stable and inclusive. In fact, these countries produce their own rent and allocate it in a way that benefits everyone. The last category should serve as a role model for all the rentier states, as it will secure not only rapid economic growth, but also equitable distribution of the profits from this growth to all citizens.

2.3.6 Contemporary analysis of the Rentier State Theory: the ‘’Late Rentierism’’

The ‘’late rentierism’’ theory is the latest stage of the evolution of the Rentier State Theory. This theory has been developed within the context of the politics of the Arab Gulf States. Gray (2011) examined the four elements that led to the situation that this theory describes. The first element is globalization. Globalization has impelled many states to liberalize their economies in many ways: reinforcement of trade activity, increase of flows of investments and capital, enhancement of transport and communication among states. The second element is the employment pressure. Globalization, in connection with the population growth, has created new employment opportunities in areas that are favorable to the employers. The third element is conservative Islamism. For Islamism, the consequences of globalization pose a significant threat to the values and the ideas that this religion advocates. So, any effort of liberalization of the economy of these states is challenging. The fourth element is the state’s reassessment of its economic approach as regards rent and survival. States become more mature and, as a result, they redefine the way they manage their natural resources and explore the possibility of diversifying their economy.

According to ‘’late rentierism’’, rentier states have seven specific features. First of all, they aren’t only responsive, but also undemocratic states. So, although they are governed by autocratic regimes, they try to respond to social needs. This does not mean that the states have undergone substantial reform or democratization, but there have

been steps towards establishing a more liberal government. Secondly, these states are open to the globalization, but remaining protectionist. As mentioned earlier, globalization is an important threat for the Arab states. Nevertheless, they make significant efforts to adapt to the new values and ideas it brings, but rather cautiously. Saudi Arabia is an indicative example, as it has been characterized as ‘’an open economy but a closed society’’. Thirdly, rentier states are economically active. This feature challenges Luciani's theory (1987), which claims that rentier states are autonomous and do not need to pursue active economic policies. As a result, these states want to develop their policy, in order to become more powerful and align with current trends. Fourthly, contemporary rentier states are ‘’energy-driven’’ and not ‘’energy-centric’’. They are less dependent on external rent, but they attempt, via the use of energy, to strengthen many sectors of their economy, like the industrial sector. Another crucial characteristic of the late rentier states is the ‘’entrepreneurial capitalist’’ structure. According to this characteristic, states do not prioritize merely managing and controlling their economy, but aim to advance it through innovative visions. The sixth feature is long-term thinking. Late rentier states try to organize and plan their next steps in order to achieve long-terms profits and be prepared for any danger that would emerge. Finally, late rentierism support an open and active foreign policy. In this way, the states endeavor to exercise their ‘soft power’’, in order to upgrade their role in the international politics and reinforce their economy.

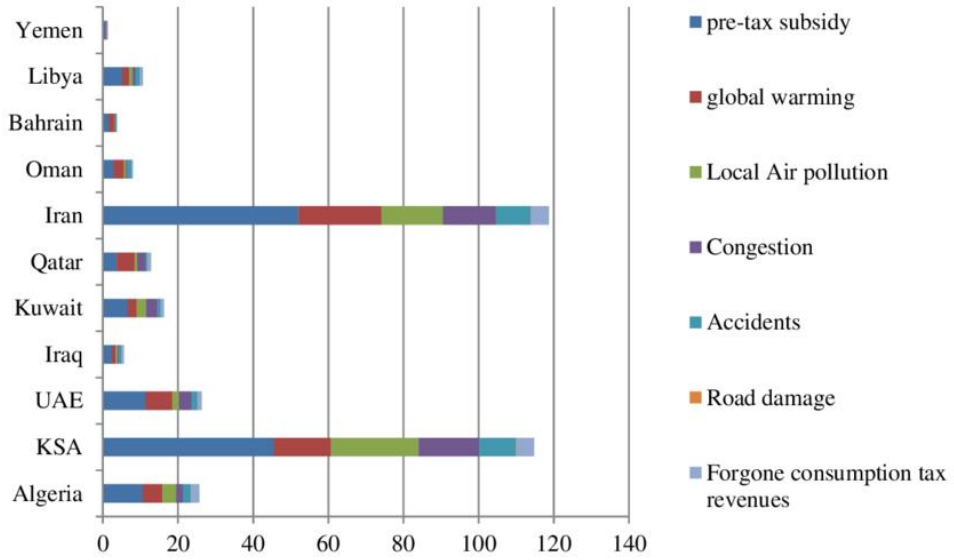
2.3.7 Energy subsidies and rentier states

Energy subsidies is an important characteristic of the rentier states. According to David Coady (2013), there are two types of energy subsidies: the consumer and the producer ones. In the case of the consumer subsidies, these increase when the prices paid by the consumers are below the supply cost. Conversely, producer subsidies increase when the prices are above the cost. Three are the reasons that can lead to this rise in prices: deliberate interventions by governments, unintended consequences of policy decisions, or market failures (IRENA, 2020).

For rentier states, energy subsidies play a crucial role in their economy. Tagliapetra (2017), highlights that high energy subsidies can lead to economic losses. This occurs because the resources sold to the domestic consumers represent only a fraction of the oil’s international market value. Moreover, energy subsidies can alter the economy of the state, as well as the competitiveness of RES. They can also hinder other competitors

from entering the market. Except from competitiveness, energy subsidies can prevent a country from exporting and participating in the international trade (Krane, 2019). Luciani and Beblawi (1987) have supported that the energy subsidies are regarded as a ''right of citizenship'' that are granted by the state in order to secure political acquiescence from the citizens. So, energy subsidies are, in some cases, connected with autocratic regimes. In Figure 2, Boudekhdekh (2022) presents the average post-tax subsidies component in MENA oil exporting countries. Iran and Saudi Arabia have the highest averages, which means that these two countries implement a significant subsidy policy in the energy sector.

Figure 2: Energy Subsidies in the MENA region



Source: Boudekhdekh, K. (2022). *A comparative analysis of energy subsidy in the MENA region.*

2.3.8 Rentier State and labor markets

Another important element to consider when analysing rentier states is the labor market. A worth mentioning aspect of this sector is that more than half of the national population is employed in the public sector. This sector is very attractive, because the wages, working hours and conditions are more favorable compared to the private sector (Hertog, 2020).

This trend started in MENA countries during the 1980s, when these states decided to import cheap foreign labor and integrate it into the private sector, allowing more

nationals to participate in the public sector (Tagliapetra, 2017). As a result, there is a shortage of skilled and professional national labor capable of contributing to the generation of the domestic rent. In this way, it is difficult for rentiers states to diversify their economies, leaving them on external rent.

Herb (2019) created a 2X2 matrix table, as it is shown in the Figure 3, in order to categorize the labor market in rentier states, taking into account the prevailing situation in the Gulf Cooperation Council (GCC) countries, which are indicative examples of rentier countries. The two components that Hertog uses are the labor market segmentation and the foreign labor.

Figure 3: Categorization of labor market in rentier states

Labor market segmentation	Foreign labor		
		More	Less
	More	Embrace foreign labor	Limit role of foreign labor only
	Less	Merge labor markets	Rely on citizens labor only

Source: Herb, M. (2019). Labor markets and economic diversification in the Gulf rentiers.

The first conclusion of the matrix table is the need to' 'embrace foreign labor''. This conclusion results from the combination of increased market segmentation and the use of more foreign labor case applies to sectors, such as tourism, where inexpensive, unskilled labor is needed. In this economy, the state imposes taxes and produces revenue, which it allocates to citizens via the public sector jobs. This model could be implemented only in countries with high per capita oil income and a small population. Hence, the UAE is an indicative example of a state where this model could be implemented. The second conclusion is to 'merge the role of foreign labor'', which results from the combination of decreased market segmentation and the use of more

foreign labor. This strategy involves three key elements: adopting a low-cost labor strategy, integrating both citizen and foreign labor market into one (leading to a less segmented and more unified market) and increasing the presence of non-citizen labor market in the state's economy. The basic problem with this strategy is the competition that will arise between the unskilled non-citizens laborers and unskilled citizen laborers, who will have to adapt to the new working conditions. The third conclusion is to ''rely on citizen labor only''. This strategy arises from the combination of decreased labor market segmentation with the use of less foreign labor. However, this approach presents several challenges. First, the economic activity in the sectors which employed non-citizens will decline. Second, both wage rates and the cost of domestically produced services will rise, making them more expensive. Third, the labor cost for the production of tradable goods will be higher. However, as Herb (2019) underlines, many nationals will enter the private sector. The final strategy is the ''limit role of foreign labor'', which results from combining increased market segmentation with the use of less foreign labor. This strategy is considered the most advantageous and requires a strong administrative mechanism, which will maintain a balance between the sectors where locals can work and those open to non-citizens labor. By reducing the number of foreign workers more nationals can be employed in private sector and generate the rent that can lead to economic growth.

2.3.9 Rentier states and political situation

When I analyzed the theory of International Political Economy, I concluded that policy and economy are two elements which are linked, as each impacts the other. Therefore, it is really important to also examine the political situation in rentier states. This examination will be divided into three sectors: regime, institutions, conflicts.

The phrase that characterizes the regime of rentier states is the following: ''taxation without representation''. In order to explain it, Hachemaoui (2012) identifies three causal mechanisms. According to the first, the state becomes autonomous without its citizens' because it relies solely on external rent and does not diversify its economy. The second mechanism refers to the state's distribution of wealth and its consequences. Through rentier wealth, the state can ensure favorable budgets that allows it to allocate profits to citizens, effectively securing domestic trust and peace. The third mechanism highlights the distribution of the wealth to society inhibits the creation of any

independent social class. These three elements illustrate that the political system in rentier states is authoritarian. By definition, an authoritarian regime is not democratic, and attempts to maintain its control via three ways: army, clientelism and the media (Hague et al., 2001). In this system, the government is autonomous from the society and present predatory behavior.

In terms of the second sector, Mehlum et al. (2006) argue that if a state's institutions are stable and friendly to the citizens, then natural resources could enhance its economic growth and development. However, this does not reflect the current situation in rentier states, in which the institutional system is eroded and hostile against society. The limited role of the bureaucratic institutional system in tax collection and the restricted information about the prevailing conditions make it difficult for the state to manage its economic system. Yamada (2019) tried to analyze the institutional system of rentier states, by examining institutional upgrading dynamics. The conclusion that emerged from his analysis was that the transitioning from authoritarianism and clientelism to an institutional system that fosters economic growth and mercatoric bureaucracy is challenging.

Civil wars play also an important role in the political situation of a state. Moore (1998) mentions two mechanisms linking the presence of minerals to the outbreak of conflicts. The first one is the ‘’looting mechanism’’, which suggests that rebel organizations try to generate revenue, to extract and sale the resources, in order to fund civil war conflicts. The generation of rent from sectors such as the manufacturing is difficult, due to their inherent mobility. The second mechanism concerns the distribution of resources. The competition and grievances of the citizens aiming to take control of the mineral resources may potentially trigger a civil war.

2.3.10 Criticism to the Rentier State Theory

After having analyzed the basic points of Rentier State Theory, it is important to examine the most important criticism that has been raised against it.

According to Hertog et al. (2020), Luciani tried to self-critique the article he co-authored with Beblawi on Rentier State Theory. He concluded that this theory is not the sole framework that can interpret the situation in oil-producing countries. He also claimed that factors such as history and civilization can play a crucial role in shaping the policies of these states.

Hertog (2020) analyzed Rentier State Theory by examining the political and economic systems of the Gulf states. His findings reveal that citizens have the willingness to sacrifice for the interest of the state. In other words, Hertog concluded that in spite of the authoritarian nature of the regime, citizens' engagement in political life remained high. Hertog also highlighted the role of political regime in the rentier states, noting that in GCC countries, the states neither act as a 'provider' nor embrace competition. As a result, state's behavior does not align with the principles of Rentier State Theory.

In his article 'Does rent really hinder democracy', Mohammed Hachemaoui (2012) delivered a substantial critique of Rentier State Theory, in relation to the political system of rentier states. In fact, he argued that oil dependency does not necessarily lead to authoritarianism, pointing out cases when the exact opposite occurred. The case of Iran and Mohammed Réza Pahlavi is indicative. Pahlavi came to power in 1941, when Iran was not as important a petrostate as it became after the oil crises of 1970's. Secondly, he argued that the ''no representation without taxation'' logic is deterministic and absolute, with exception that contradict this logic. Thirdly, he underlined that oil rent isn't incompatible with democracy, citing Venezuela as an example where rent and democracy are linked. Fourthly, he explained why rent cannot buy citizens' support, by using three arguments: 1) in many countries, such as Algeria, there is the perception that ''oil belongs to everyone'', 2) citizens compare their incomes with those of the rulers', stressing a lack of legitimacy and 3) corruption in these countries leads to inequalities and underdevelopment causing dissatisfaction among those citizens who are mostly marginalized and excluded.

2.3.11 Conclusion

To summarize, International Political Economy is a field of studies which presents the linkage between economy and politics. Rentier State Theory is a sub-theory of IPE theory. RST examines the when a major oil-producing country presents slow economic growth. In order to pinpoint the causes of the situation, the theory analyses the energy subsidies and the labor market and relates them to the energy resources these countries use, as well as the prevailing political system that may also hinder economic growth. Furthermore, the presentation of the most current versions of this theory led to a better understanding of the fact that efforts made by rentier states to significantly restructure their economies failed. Finally, the criticism discussed indicates that this theory presents significant shortcomings and needs further improvements.

Chapter 3: Macroeconomic analysis

3.1 Introduction

In this chapter, I will explore the science of macroeconomics, providing a clear definition and examining key indicators. In fact, these indicators will be later used to analyze the case studies in detail

3.2 The theoretical context of macroeconomic

According to Giannelis et al. (2014), macroeconomic theory focuses on the economy as a whole rather than the behavior of individual consumers and businesses. So, it examines aggregates such as consumption, investment, and saving, typically in relation to a single measure - national product. The theory seeks to address several key issues, including the following:

- Inflation
- Unemployment
- Economic growth
- Deficit or floating in the trade balance

In this thesis, I will examine six macroeconomic indicators:

- GDP: a measure of the monetary value of both final goods and services produced in a country;
- GDP growth: an indicator that reflects the change in the value of goods and services produced during a period of time;
- GDP per capita: a measure that differs from GDP, as it divides the total GDP by the population, providing insight into a country's living standards;
- Inflation: a phenomenon where the purchasing power of money decreases as prices rise;
- Current Account Balance: the difference between a country's inflows and outflows of goods, (services and financial transfers) and

- Unemployment: the percentage of people who are actively seeking work but do not have paid employment.

3.3 Conclusion

In conclusion, macroeconomic analysis is a valuable tool for examining a country's economic condition and overall economic landscape. It provides insight into the decisions made by the state, particularly those related to its economic policies

Chapter 4: Energy transition

4.1 Introduction

Energy transition has become a prominent trend in recent years, due to the increasingly sever impacts of climate change and the growing need to transition from fossil fuels to more environmentally friendly energy sources such as renewables. However, its implementation is challenging, because many states, particularly the oil-producing ones, have strong interest in oil and carbon. While study of all aspects of the energy transition is quite a complex affair, I will try to give a fairly clear picture of the term and I will delve into the international commitments that paved the way of energy transition, the driving forces, the implications and the feasible concerns.

4.2 Theoretical analysis of energy transition

To start the analysis, it is essential to examine the theoretical context of energy transition. Through a thorough literature review, I concluded that there is no universally accepted definition of energy transition. Each analyst offers its own interpretation of the term, ranging from general to more specific ones. To begin with, according to Araújo (2014, pp.112) energy transition is considered *''a shift in the nature or pattern of how energy is utilized within a system''*. In this context, energy transition is described as a ''shift'', or a ''change'', in the way energy is used in the nature. However, this definition seems to be rather general, stressing the perpetual nature of this shift, rather that referring to the actual forms of energy transition, as can be seen in other more concrete definitions.

For example, Miller et al. (2014, pp.31) support that energy transition involves in the *''shifts in the fuel source for energy production and the technologies used to exploit that fuel''*, which means that the goal of energy transition is to minimise reliance on fossil fuels and promote the adoption of alternative forms of energy, such as the renewables.

Furthermore, The Sustainable Energy Hub of the United Nations Development Program defines energy transition as *''a continuing process requiring long-term energy strategies and planning, with a country-tailored focus on applying appropriated energy*

technologies to reach net-zero emissions''. The additional element in this definition is the effort to achieve net-zero emissions, with a view to balancing greenhouse gas (GHG) emissions produced with those removed from the atmosphere.

The final definition that will be discussed in order to complete the theoretical framework of the energy transition is this of International Renewable Energy Agency (IRENA, 2023), according to which energy transition is ''*a transformation of the global energy sector from fossil-based to zero-carbon sources by the second half of this century, reducing energy-related CO2 emissions to mitigate climate change and limit global temperature to within 1.5° of pre-industrial levels''*. So, not only is it significant to bring off net-zero emissions, but also to reach the specific temperature.

Hailes et al. (2023) identify three key dimensions of energy transition. The first dimension is the technological one, which encompasses the technologies required to achieve the transition to renewable sources of energy, while it also proposes the amelioration of both the energy system and the energy storage. The second dimension is the socio-economic one, which highlights the social and economic impact of energy transition on a state and the acceptance of this transition by its citizens. The final dimension is the normative one, which addresses the socio-economic problems that emerge from the energy transition.

4.3 International Commitment and Energy Transitions

Two of the most important treaties that played a crucial role in the implementation of energy transition are the ''Kyoto Protocol'' and the ''Paris Agreement''.

The Kyoto Protocol, adopted on 11 December 1997 and effective from 16 February 2005, has been ratified by 192 countries. The main goal of the protocol is to reduce six specific greenhouse gases: Carbon dioxide (CO2); Methane (CH4); Nitrous oxide (N2O); Hydrofluorocarbons (HFCs); Perfluorocarbons (PFCs); and Sulphur hexafluoride (SF6). Kyoto Protocol also pertains to energy, including fuel combustion from energy industries, manufacturing and construction industries, transport and other sectors, as well as solid fuels, oil and natural gas. As it is predicted in the treaty, 37 industrialized countries and the EU members have to reduce their emissions by an average of 5% below 1990 levels.

Two key issues emerge from the analysis of Kyoto Protocol. The first issue is the Emission Trading System referenced in Article 17, according to which carbon will be traded, as a commodity on a specialised market, known as the 'carbon market'. The second issue concerns the three mechanisms for reducing GHG emissions. The first mechanism is the Clean Development Mechanism, which, is referred in Article 12. This mechanism allows a state to implement projects in developing countries, which contribute to the mitigation of global emissions (United Nations). The second mechanism is the Joint Implementation, which enables states to earn an Emissions Reduction Units (ERU) through the application of ''energy removal'' projects (United Nations). The final mechanism is the International Emission Trading, which allows the trade of Assigned Amount Units (AAUs), among industrialized countries (United Nations).

The Kyoto Protocol was amended in 2012, in Doha, introducing new emissions reduction targets, in a new commitment period between 2012-2020. However, this amendment was not successful and, thus, in 2015 a new treaty was signed: the Paris Agreement.

The Paris Agreement, adopted on 12 December 2015, consists now of 196 members. Article 2 of this agreements outline three key goals:

(a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;

(b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and

(c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

So, the first goal focuses on limiting the global temperature increase to well below 2°C and reach the ideal 1,5°C above industrial levels. But, to achieve this, the GHG emissions: a) mustn't peak after 2025 and b) have to decline by approximately 43% by 2030 (United Nations). The second goal concerns the policies the leaders of the world

have to implement, in order to help countries better adapt to the changes posed by climate change. The third goal stressed the need to align economic activities with efforts to mitigate climate change.

The Paris Agreement operates through Nationally Determined Contributions (NDCs), which are national climate action plans submitted by states to the United Nations Framework Convention on Climate Change (UNFCCC) secretariat every five years. These plans outline each state's proposal for the amelioration of climate conditions and the reduction of atmospheric emissions. Apart from the NDCs, states have the opportunity to develop Long-term Low Greenhouse Gas Emission Development Strategies (LT-LEDS). These strategies constitute a long-term vision of NDCs, but, unlike NDCs are not binding (United Nations).

It is worth underlining that countries support each other in achieving the goals of the Paris Agreement in three ways. The first one is through financing, where developed countries provide substantial financial assistance to more vulnerable countries, so that the latter can strengthen their mitigation and adaption efforts against climate change. The second way is technological support, with the Paris Agreement fostering the creation of a robust technological framework that can confront all challenges posed by climate change. The third way is capacity-building, where the Paris Agreement gives emphasis to the implementation of capacity building mechanisms in developing countries to enhance their safety and their stability (United Nations).

4.4 Driving Forces of Energy Transition

In this unit, I am going to discuss the drivers of the energy transitions, namely the factors that play a crucial role in the implementation of this mechanism.

The first driver is technological innovation. The development of technologies such as solar panels, turbines and smart grids contributes to the promotion of energy transition (Burhans et al., 2024). Moreover, technological innovation enhances both the productive sector and the energy systems and increases the efficiency in matters such as competitiveness within the energy industry. In addition, consumer-producer relations are changing to a great extent, while countries can elevate their roles in the new energy sector and actively participate in new energy developments (Yang, et al., 2019).

The second driver is market mechanism, which can decisively influence the energy sector in three ways: a) from the perspective of supply and demand, energy demand combined with the promotion of sustainable development will create a market aligned with the goals of energy transition, b) the establishment of a carbon market will be conducive to reducing emissions and improving climate conditions and c) the investment market will support the development of diversified energy sources, such as renewable sources, giving even greater impetus to the implementation of energy transition (Yang et al., 2019). Thus, through the promotion of energy transition, Renewable Energy Sources (RES) are becoming more cost-competitive than fossil fuel (Burhans et al., 2024).

The third driver is policy arrangement, according to which regulatory and institutional reinforcement, as well as the adoption of appropriate policies, will be crucial in achieving energy transition and integrating renewable energy resources in state energy planning (Yang et al., 2019).

The fourth involves the culture, the habits and the way of life of a region, which will significantly influence whether a unilateral or a multilateral energy policy is adopted, and whether this policy will give impetus to the energy transition (Burhans et al. 2024).

The fifth driver, presented from IRENA in the World Energy Transition Outlook of 2021, is energy poverty. The European Commission defines energy poverty occurring ‘’*when a household must reduce its energy consumption to a degree that negatively impacts the inhabitants' health and wellbeing’’*. Energy poverty is caused by a) high proportion of household expenditure on energy, b) low income and c) low energy performance of buildings and appliances (European Commission). So, in order to meet the needs for energy resources, states, must diversify their energy sources in order to maximise household energy access.

The final driver is energy security. According to Sovacool (2019), energy security comprises four dimensions: availability of energy resources, affordability of energy accessibility to energy resources and acceptability of resources from the society. All four dimensions must be present for a state to be regarded as energy secure. According to World Energy Outlook 2022, energy transition is directly linked with energy security

and the implementation of the first, ten guidelines outlined in the Outlook can help ensure the latter.

4.5 Implications of Energy Transition

Having outlined the key drivers of the energy transition, it is important to examine its further implications. In the following section, I am going to focus on three types of effects: the social, the socio-economic and the ecological.

Regarding the first category of effects, Yang et al. (2024) identify that there are two school of thoughts that address these impacts, by focusing on the phenomenon of ‘’energy poverty’’. The first school of thought claims that energy transition exacerbates energy poverty, due to rising costs of energy and fuel consumption, thereby increasing the financial burden on households and eventually leading them to energy poverty. Conversely, the second school of thought argues that energy transition alleviates energy poverty, by promoting the distribution and decentralisation of Renewable Energy Sources, which will become accessible to all. Moreover, according to Õunmaa (2021) and Casals et al. (2019), human and global welfare will be significantly improved, with the welfare index projected to rise from 5% in 2030 to 15% in 2050, leading to advancements in healthcare, education, material consumption and energy access across many states.

Concerning the economic effect, there are two different perspectives. From a positive standpoint, energy transition can enhance the diversification of the energy supply, stabilize fossil fuel prices and bolster the sustainability of the economy (Yang et al., 2019). Moreover, as Õunmaa (2021) has underlined, increased investments on Renewable Energy Sources will not only stimulate demand and supply within the economic sector, but also lead to GDP growth. Additionally, the diversification of supply chains will elevate the demand for labor and wages over time. On the one hand, employees can be engaged in ‘’green jobs’’ that set out to protect the environment. As Õunmaa (2021) supports, the creation of new jobs, related to energy transition, such as those in manufacturing and electricity supply, is expected to increase significantly by 2030, with some growth continuing into 2050. Casals et al. (2019) argue that the long-term job growth is due to increased consumer expenditure, while short-term growth is influenced by tax rate changes. On the other hand, because energy transition is an

evolving phenomenon, there is no certainty that the jobs it creates will continue to thrive (Yang et al., 2019).

The final effect is the ecological, which, as the two previous effects, is also debatable. Many scientists support that energy transition will benefit the climate, by reducing carbon dioxide emissions. However, this optimistic view is no without its limitations. First, the success of energy transition relies heavily on the growth of the economy and the level of income inequality. Second, it can cause environmental hazards, such as damages to areas designated for the development of Renewable Energy Sources. (Yang et al., 2019).

4.6 Energy Transition and Feasible Concerns

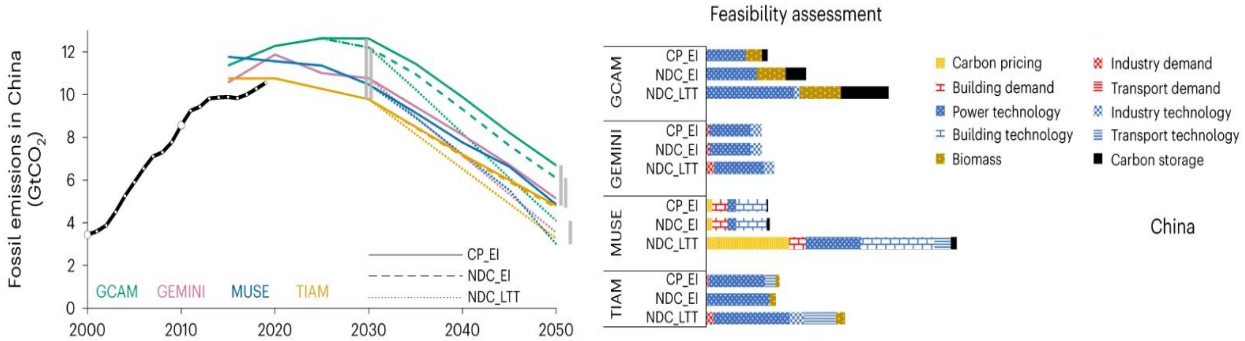
To conclude this chapter, I will examine the feasible concerns regarding the implementation of energy transition. I will draw on four models which apply mathematical models to evaluate the feasibility of this application. According to Ju et al. (2023), feasibility is defined as*' 'an assessment of the extent to which a socially important goal (e.g., the net-zero goal) is achievable under various constraints in a particular spatiotemporal context, conditional upon attempts and efforts by actors, and can be expressed probabilistically''*.

The first study is by Doukas et al. (2022). The writers use four Integration Assessment Models (IAM), GCAM-PR, GEMINI-E3, MUSE and TIAM-Grantham, in order to examine the feasibility of energy transition application among six countries (EU, India, USA, China, Japan and Russia Federation), according to three specific scenarios:

- *The first scenario (Current Policy extrapolated with EI, CP_EI) is based on the current portfolio of actual emissions reduction policies as well as credible policy targets until 2030 in G20 countries including the entire EU*
- *The second scenario (NDCs extrapolated with EI, NDC_EI) is based on stated 2030 emission targets captured in NDCs submitted or announced by June 2022, capturing all mitigation ambition updates related to the COP26 in Glasgow*
- *The third and most ambitious scenario (NDCs with LTTs, NDC_LTT) is built on the NDC_EI until 2030 but, for regions that expressed an LTT, such as net-zero commitments or other targets for 2050 or later*

These models aim, according to United Nations, ‘’ *to provide policy-relevant insights into global environmental change and sustainable development issues by providing a quantitative description of key processes in the human and earth systems and their interactions’’*. Each model has distinct particularities and characteristics, resulting in various outcomes. Delving into the study’s conclusions, it is important to outline the three types of feasibility concerns identified by the authors : a) the socioeconomic feasibility concerns, which relate to the cost burden of the implementation of the mitigation policies, b) the technology scale-up feasibility concerns, which stress the replacement of certain technologies with others and c) the physical feasibility concerns, which focuses on physical potentials for both production of bioenergy and carbon storage. Regarding the conclusion of the study, the authors acknowledge that their findings are not entirely valid, due to the absence of additional factors or indexes that could have been incorporated into the study. Nevertheless, using these models, the authors observe that the feasibility of implementing energy transition varies among different countries. For instance, in the Figure 4, they present the case of China and the application of the four models in this state. In the case of the NDC_LTT goal, the MUSE model suggests that the feasibility of energy transition is more successful that the GCAM model claims.

Figure 4: Implementation of IAM models in the case of China



Source: Doukas et al. (2023). A multimodel analysis of post-Glasgow climate targets and feasibility challenges.

To conclude, it is evident that the feasibility of energy transition remains debatable, and certainty regarding its implementation cannot be assured.

The second study conducted by Dupont et al. (2021) uses two models to examine feasibility on a global level. The first is a macroeconomic input-output model that includes both the energy and the non-energy sector. The second is an energy model, designed to calculate the potential of solar and wind energy. The conclusions that emerge from this study are the following: first, energy transition to a 100% renewable energy system is not feasibly before 2100. Second, technological innovation which can drive energy transition is attainable within a finite timeframe, requiring a significant reduction in energy intensity by about 50% by 2070. Finally, limiting the cumulative quantities of CO2 emissions to maintain global temperature rise seems to be a challenge.

The third study, conducted by Bernie et al. (2017), provides a brief analysis of historical energy transitions, to determine whether insights from past transitions can be applied to future ones. Moreover, as shown in figure 5, the authors use six tests, generated from the TIAM-GRANTHAM model, to evaluate the feasibility of energy transition.

Figure 5: Tests used for the assessment of the feasibility of energy transition

Area of Assessment	Description of Test	Previous Uses of Test
How rapidly are low-carbon technologies deployed?	Test 1: Comparison of future low-carbon technology growth rates to highest historically observed energy technology growth rates (around 20% per annum)	Iyer et al. [17]
	Test 2: Comparison of the average annual additional capacity (GW/year) to historical values for different technologies (>50 GW/year for coal, 10–20 GW/year for gas, nuclear and wind, <5 GW/year for solar over the period 2000–2010, as shown in Section 5.2.2)	Van der Zwaan et al. [14]
	Test 3: Analysis of duration of deployment for a given level of installed capacity over the full technology lifecycle (as discussed in Section 5.2.3)	Wilson et al. [23]
What is the pattern of low-carbon technology deployment?	Test 4: Assessment of how technology growth rates compare to a logistic growth profile (See Section 5.3.1)	Wilson et al. [23]
	Test 5: Consideration of change in rate of growth of primary energy resources once they reach a material (~1%) share of primary energy (See Section 5.3.2)	Kramer and Haigh [21]
What is the rate of transition between primary energy resources?	Test 6: Analysis of the overall energy transition in terms of primary energy shares using a multiple logistic substitution model. This type of model, described in Appendix C, describes the growth, saturation and decline of technologies over time as new technologies compete with existing technologies to take away their market share. (See Section 5.4)	Gruebler [20], Smil [11]

Source: Bernie D., Gambhir A., Hawkes A., Lowe J., Napp T., Thomas R., (2017). Exploring the Feasibility of Low-Carbon Scenarios Using Historical Energy Transitions Analysis.

Based on these tests, the authors identified on two low-carbon scenarios:

a) *the first with key energy supply technology growth rates constrained to 20% per annum, reflecting the higher end of previous energy and pollution control technology growth rates and*
b) *the second with additional growth constraints to wind and solar, as well as the specification of a minimum usage level of unabated coal generation plants, according to which with these constraints the energy systems model used to produce the low-carbon scenarios can no longer solve.*

It seems that the two scenarios present significant challenges. However, if I compared the two, I would argue that the second one appears to be less feasible due to the greater number of constraints that impede its implementation.

4.7 Conclusion

In summary, I have explored the theoretical framework of energy transition, by examining the key definitions provided so far. Additionally, I have highlighted the international legal instruments governing this transition, namely the Kyoto Protocol and the Paris Agreement. In addition, I also discussed the driving forces behind this transition, its potential implications as well its concerns regarding its feasibility. Through this analysis, it is construed that energy transition is an evolving subject which requires further study. In any case, it is imperative that states fully understand the essence of energy transition, which will ensure that its implementation will not encounter any significant obstacles in the future.

Chapter 5: MENA region

5.1 Introduction

In this chapter, I will examine the MENA region, which includes Algeria and Qatar. The aim of this analysis is to understand the economic environment in which these countries operate. Specifically, I will present key fact about the region and conduct a macroeconomic analysis using four indicators: GDP, Current Account Balance, Overall Fiscal Balance and Inflation.

5.2 The identity of MENA region

MENA region comprises states from the Middle East and North Africa, stretching from Morocco and to Iran. It is also referred to as the 'Greater Middel East' or the 'Arab World'. The countries in this region share several common characteristics, including:

- the use of The Arabic language
- the Muslim religion and
- the geographical proximity

  (Istizada, 2024)

Regarding the first characteristic, it is important to note that all countries in the region, with the exception of Iran, primarily speak Arabic. As for the second characteristic, most countries adhere to Islam, with Israel being the notable exception. Additionally, the third characteristic - geographic proximity - divides the region into three subregions:

- The GCC region, which includes the Gulf countries,
- The Levant region, which consists of Israel, Palestine, Syria, Turkey, Cyprus and Israel and
- North Africa, which includes Tunisia, Morocco, Libya, Egypt, Sudan and Algeria

  (Istizada 2024)

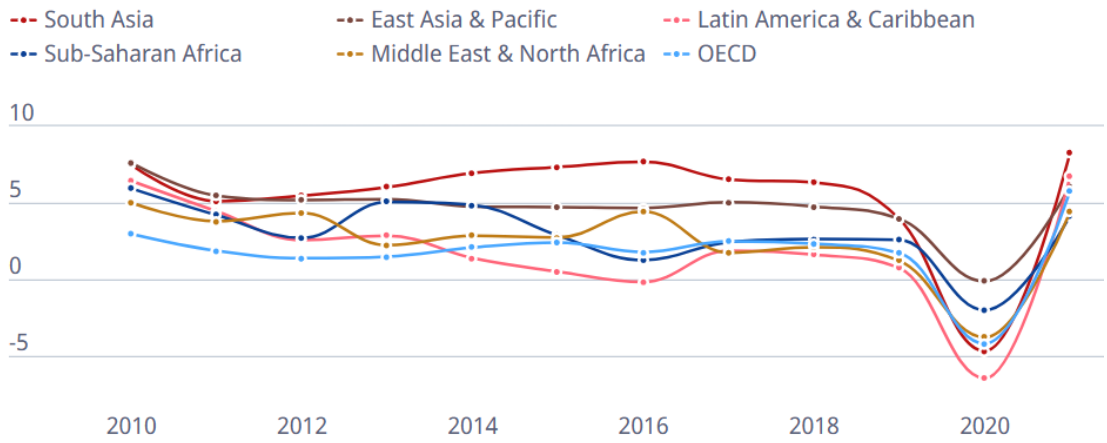
The term ''MENA region'' was coined by the World Bank and the United Nations, to define this entire area and to establish corresponding institutions to address its specific needs. It is also worth mentioning that countries such as Turkey, Afghanistan and

Pakistan, Cyprus and Sudan are not included in this classification, either due to their geographical location or because of differing linguistic and religious characteristics (Istizada, 2024)

5.3 Economic situation and macroeconomic analysis of the MENA region

In 2023, the MENA's region GDP reached $7 trillion, accounting for 5% of the global GDP (Istizada, 2024). The region experiences significant economic growth in the years leading up to COVID-19, with its peak occurring in 2016, as shown in Figure 6. However, rising food prices, inflation, and increasingly difficult financial conditions have created a complex set of challenges for the region (OECD, 2021).

Figure 6: MENA economies grew at a stronger rate than most regions of the world over the past year



Source: Organisation for Economic Cooperation and Development (2021)

Moreover, according to the IMF's Outlook for the Middle East and Central Asia (2024), two additional factors have further hindered the region's economic growth: the ongoing conflict between Israel and Palestine, and recent oil production cuts. These issues have contributed to the slowdown of the MENA economies, adding to the existing difficulties.

In Figure 10, I present MENA's macroeconomic indicators, which provide insight into the economic situation of the area

Figure 7: MENA: Selected Economic Indicators, 2000-25

	Average				Projections	
MENA	2000-20	2021	2022	2023	2024	2025
Real GDP (percent change year-over year)	3.9	4.1	5.6	2.0	2.9	4.2
Real GDP (percent change year-over year) of which non-oil growth	4.8	4.4	4.5	3.2	3.5	3.8
Current Account Balance	6.3	4.2	10.3	5.3	3.9	3.5
Overall Fiscal Balance	1.2	-1.7	3.6	0.1	-1.3	-1.1
Inflation (percent change, year-over-year)	7.4	14.0	14.4	16.5	14.4	11.6

Source: International Monetary Fund (2024)

Starting with GDP, the average percentage change for the period from 2000 to 2020 was 3.9%, indication a consistent upward trend, as there were no negative fluctuations during these years. There is also a significant increase in the GDP of MENA countries in 2021 and 2022, while in 2023 the percentage change dropped to approximately

3.6%. Looking ahead, forecasts for 2024 and 2025 suggest that GDP will continue to increase significantly

Regarding the account balance, the average for the period from 2000 to 2020 is 6.3, indicating that the exports of MENA countries surpassed imports over these 20 years. However, the balance has exhibited significant volatility, between 2021 and 2023, recording values of 4.2, 10.3, and 5.3 for each respective year. Furthermore, forecasts for 2024 and 2025 suggest a downward trend in the current account balance

Analyzing the overall fiscal balance, the average price for the first twenty years of the 21st century is around 1.2, indicating that government revenues significantly exceeded expenses. In 2021, however, this situation changed, as the balance fell into negative territory. By 2022, it returned to positive levels reaching 3.6. In 2023, government revenues were nearly equal to expenses, resulting in a balance of 0.1. Unfortunately, predictions for 2024 and 2025 are not encouraging, as government expenses are expected to exceed revenues once again, leading to negative levels.

Finally, as mentioned above, inflation is one of the most significant challenges facing MENA countries, as illustrated in the table above. From 2000 to 2020, the average percentage change in inflation reached 7.4%, while in the subsequent years, this rate doubled. Forecasts for 2024 and 2025 indicate a decrease in the inflation rate; nevertheless, it is expected to remain above 10%.

5.4 Energy situation and energy transition of the MENA region

The MENA region is notable for providing 60% of the world's oil and 45% of its natural gas reserves, establishing it as a major player in the global energy market. OPEC, an intergovernmental organization, which includes founding members from the MENA organization, remains a powerful entity that significantly influences energy-related issues. This organization has expanded its reach and now includes 60 members from other continents (OPEC).

This region presents some important characteristics, which, according to Bonometti et al. (2023) are the following:

- Some countries in the region, particularly the GCC countries, are major hydrocarbon producers.
- There is a division among countries based on the fossil fuels they produce

- Electricity consumption has increased significantly over the last thirty years
- The energy mix of the MENA region primarily consists of oil and natural gas

Even though these countries rely heavily on oil and natural gas, as discussed, they are making significant efforts in order to adapt to the changing landscape of the energy transition. As demonstrated in the analysis of Algeria and Qatar, countries in the MENA region are actively taking initiatives and developing plans to facilitate this transition

According to Francesco La Camera (2024), Director General of the International Renewable Energy Agency MENA countries can achieve energy transition by following three steps

a) through the construction of facilities
b) through the implementation of policies and initiatives and
c) thirdly, through the enhancement of institutional capability

5.5 Conclusion

In conclusion, the MENA region is vitally important for the global energy market. While it experiences significant economic instability in certain indicators, like the current account balance, it remains an area that can play a crucial role in both economic and energy developments.

Chapter 6: The case of Qatar

6.1 Introduction

In this chapter, I will attempt to accomplish two distinct objectives. On the one hand, I will demonstrate that Qatar is a rentier state, by analyzing its economy using macroeconomic indexes. Moreover, I will highlight the most important aspects of the country's energy profile. To conclude, I will illustrate Qatar’s rentier mentality by examining four factors: dependence on resource rents, energy subsidies, labor force, political regime. On the other hand, I will explore Qatar's efforts to adapt to the changes that the energy transition will bring.

6.2 Macroeconomic analysis

6.2.1 Introduction

In figure 6, I have complied six macroeconomic indicators, in order to analyze Qatar’s macroeconomic situation, from 2016 to 2023 As a general observation, it is obvious that these indicators exhibit significant volatility, which means that the economy of Qatar isn’t stable. To better understand Qatar’s economic landscape during this period, I will focus on two key events: the COVID pandemic in 2020 and the hosting of FIFA World Cup in 2022.

Figure 8: Macroeconomic indicators of Qatar

Qatar	2016	2017	2018	2019	2020	2021	2022	2023
GDP (current US billion $)	151,73	161,09	183,33	176,37	144,41	179,73	335,77	-
GDP growth (annual %)	3.1	-1.5	1.2	0.7	-3.6	1.6	4.2	-
GDP per capita (current US$)	58,467	59,408	66.264	62,827	52,316	66,859	87,480	-
Inflation, consumer prices (annual %)	2.7	0.4	0.3	-0.7	-2.5	2.3	5.0	3.0
Current account balance (% of GDP)	-5.5	4.0	9.1	2.4	-2.1	14.6	26.8	-
Unemployment, total (% of total labor force) (modeled ILO estimated0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Source: World Bank data (2023)

6.2.2 Qatar's GDP

To begin with, in 2020 Qatar's GDP, hit a low of $ 144,41 billion reflecting the negative impact of the COVID-19 pandemic. This marked a decrease of $131,96 billion from 2019. However, in 2022, GDP surged by approximately 53.5% from 2021, reaching $335,77 billion. Thus, this significant growth highlights the economic benefits Qatar gained from hosting the FIFA World Cup.

6.2.3 Qatar's GDP growth

In terms of GDP growth, Qatar experienced a decline of approximately 4.3% in 2020, dropping from 0,7% to -3.6%, signaling a shift into negative territory due to the impact of COVID-19. However, in 2022, GDP growth rebounded from 1.6% to 4.2%, reflecting the positive economic effects of hosting the FIFA World Cup. As a general comment, Qatar's GDP growth has been slow and unstable, indicating challenges in managing consistent development.

6.2.4 Qatar's GDP per capita

In 2020, Qatar had the lowest GDP per capita at $52.316 billion; however, in 2022, Qatar experienced the highest growth, with GDP per capita increasing from $66.859 billion to $87.480 billion. As regard GDP per capita, it is important to clarify that it is influenced not only by GDP but also by population size. So, while Qatar's GDP increased during the pandemic, its population decreased. As a result, this led to a significant rise in GDP per capita, which peaked in 2022.

6.2.5 Qatar's inflation

As far as the inflation rate in concerned, the COVID-19 pandemic initially reduced inflation in Qatar due to the economic crisis, and decreased prices of goods. However, in 2021 and 2022 inflation rates increased to 2.3% and 5.0% respectively, driven by rising prices. In 2023, inflation started to be better managed resulting in a decrease to 3.0%.

6.2.6 Qatar's current account balance

The current account balance mirrors the trends seen in GDP. Hence, in 2020, it decreased by approximately 2.5%, dropping 2.4% to -2.1%. However, a notable turnaround occurred between 2020 and 2021, with the balance surging from 2.1% to 14.6%. which proves that Qatar addressed the problems of the COVID-19 and strengthened its economy. This rise also suggests that exports substantially exceeded imports. In 2022, the current account balance continued to increase, reaching 28.6%.

6.2.7 Qatar's unemployment

In conclusion, the unemployment rate has remained stable over the years. However, as it will be analysed in another section, employment conditions are notably poor.

6.2.8 Conclusion

In conclusion, the analysis of Qatar's economy revealed that the country had to navigate the negative consequences of the pandemic. However, with the hosting of the World Cup and subsequent events, Qatar gained a significant economic advantage. Moreover, the unemployment rate is the only macroeconomic indicator which present a stability.

6.3 Energy profile

4.3.1 Introduction

In order to understand Qatar's behavior as a rentier state, it is important to analyze the energy profile of the country. More specifically, I will examine Qatar's energy mix, energy production, energy consumption, energy trade and energy poverty.

6.3.2 Energy mix

According to IEA (2021), Qatar's energy mix is dominated by natural gas, which accounts for 92.1%, while the remaining 7.9% comes from oil and additives. Between 2000 and 2021, natural gas energy supply has notably increased from 396.512 TJ (Terajoule) in 2000, to 1.655.089 in 2021. In contrast, oil supply remained stable, during this period and biofuels are almost entirely absent from Qatar's energy mix.

6.3.3 Energy production

It is worth mentioning that between 2000 and 2021, the production of crude oil, natural gas and electricity increased by 84%, 587% and 465% respectively. The remarkable growth in natural gas and electricity generation highlights Qatar's efforts to achieve energy independence, enhance energy security, and solidify its position as a global energy power.

6.3.4 Energy consumption

According to Enerdata (2023), Qatar's total energy consumption is around 18 toes (tone of oil equivalent). Between 2000-2013, the total energy consumption grew significantly, from 13.873 toe to 38.921 toe, whereas from 2013 to 2021, consumption increased by about 1 toe annually. The majority of energy consumption is attributed to natural gas (81%), with oil accounting for the remaining 19%. Most of the energy is used by industry (36%,) followed by transport (18.4%) and residential sectors (9%) (IEA, 2021).

6.3.5 Energy Trade

In 2022, Qatar's total exports amounted to $119 billion, with energy products making up 86% of these exports. The key exports were petroleum gas (56%), crude oil (17,4%) and refined oil (12,5%). Qatar's largest trading partner is China, followed by Japan and South Korea (Observatory of Economic Complexity, 2022). From an international relations perspective, Qatar seeks to strengthen cooperation with China, which is emerging as a global power in the international system. Meanwhile, China aims to expand its influence in Asia through the implementation of 'One Belt, One Road' initiative, actively seeking new partnerships (Junhua Chen et al., 2023).

6.3.6 Energy Poverty

According to Kui Zhou et al. (2022), Qatar is the second most energy-rich country among the states involved in the ''One Belt, One Road' initiative. This highlights

Qatar's energy strength and its success in securing all four 'As' of energy security, as defined by Sovacool (2019): availability, affordability, accessibility, acceptability.

6.3.7 Conclusion

To conclude, Qatar is a significant energy player not only in the Middle-East, but globally. The country seeks to strengthen its energy sector by ensuring that energy supports various domestic industries while also leveraging energy as a strategic tool through international trade.

6.4 Is Qatar rentier state?

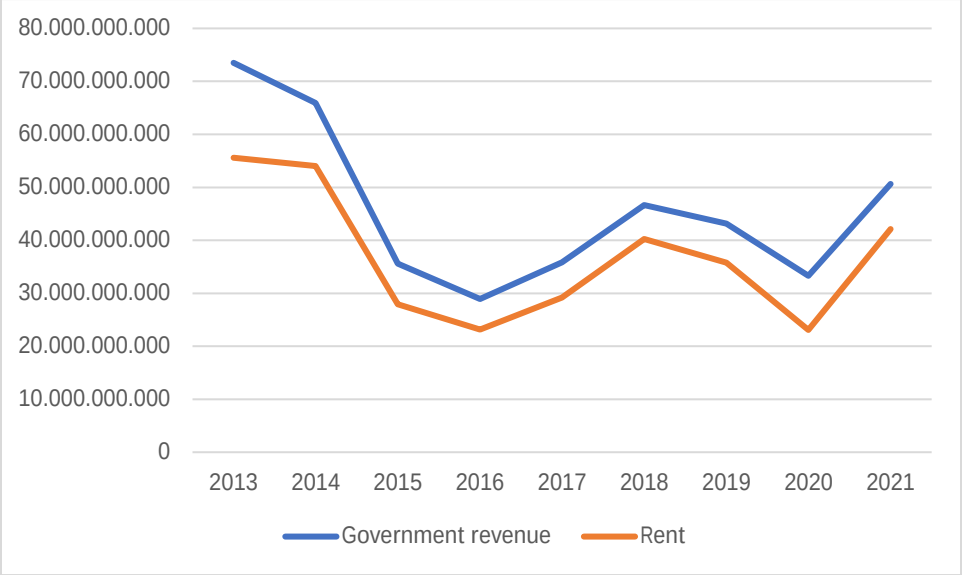
6.4.1 Introduction

In this section, I will examine whether Qatar qualifies as a rentier state based on its reliance on rent. Additionally, I will assess whether its characteristics align with those of a rentier state, in three specific areas, energy subsidies, labor market and political situation, as outlined and discussed in the theoretical framework in Chapter 2.

6.4.2 Reliance on rent

The examination of the first factor involves calculating rent as a percentage of government revenues. As mentioned in the Chapter 2, according to Luciani (1987), a state is considered rentier if this percentage exceeds 40%. So, I used data from ''Trading Economics'' and IMF for these two indicators for the period 2013-2021 and attempted to calculate the percentage for each year. The analysis shows that the percentage of rent consistently exceeded 40% each year. Specifically, the percentages ranged from a low of 69.3% to a high of 86,2%, with an average of 79.8%. This indicates that rent accounted for than half of the government revenues, classifying Qatar a rentier state. As shown in figure 7, the movement of the two indicators is almost parallel, further demonstrating the government's reliance on oil rents for revenue.

Figure 9: Qatar's rent as a % of government revenues



6.4.3 Energy subsidies

According to IMF data from 2022, Qatar had the highest fossil fuel subsidies per capita, with approximately $14,100 spent per person, primarily on natural gas. Despite these subsidies, Qatar remains the only Gulf state with a natural gas surplus. Additionally, Qatar leads in fossil fuel consumption per capita at 198,993 toe (Bp Statistical Review of World Energy, 2022), indicating that a significant portion of the population relies on these energy subsidies (Ginar Eskandar, 2023). In 2016, Qatar attempted to reduce energy subsidies, despite a 30% increase in gasoline prices. However, this move led to an anticipated budget deficit (Wil Crisp, 2016). According to the Middle East and Central Asia Department of Monetary Fund (2024), one of Qatar's strategies to enhance stability and accelerate economic transformation is the ongoing reform of energy subsidies. These reforms aim to promote energy efficiency, generate fiscal savings, and reduce government debt by 2030.

6.4.4 Labor force

In Qatar the labor force has increased significantly, reaching 2.035.269 people in 2023, or 75% of the population, according to the World Bank data. Of this workforce, only 0.1% of the population is unemployed, as mentioned in the first section of the chapter, which means that almost everyone in Qataris is employed. However, as will be discussed in the analysis of Qatar's political situation, working conditions are poor. Another important factor is that women make up 17.1% of the total labor force, whereas men account for 82.9%, indicating that the labor force is male dominated (World Bank,

2023). However, the key element relevant to the rentier state analysis is the distribution of Qataris working in the private versus the public sector. Although around 80% of the total labor force works in the private sector and 10% in the public sector, only 8% of Qataris are employed in the private sector, with nearly three-quarters working in government departments (Planning and Statistics Authority, 2020). Indeed, in 2020, around 47% of the labor force worked in the construction sector, whereas, 9% of the Qataris favored sectors, such as public administration, health and education (Planning and Statistics Authority, 2020).

6.4.5 Political situation

In this section, I will analyze Qatar's political situation, starting with the examination of its political regime. Qatar is a constitutional monarchy, with a political system grounded in the separation and collaboration of powers (Ministry of Foreign Affairs). The head of the state is the Amir, a figure who commands respect from citizens due to his dual role as both the nation's leader and the Commander-in-Chief of the armed forces. Moreover, the Amir represents the country in all external affairs. The executive power is vested in the Council of Ministers, the ministries and the government authorities, whereas the Advisory Council (Shura) is responsible for the legislative power (Ministry of Foreign Affairs). There are no political parties, which means that citizens cannot change leadership through elections (U.S Department of State). However, the Qataris have had the right to vote in municipal elections since 1999, provided they are at least 18 years old (John D. Anthony et al., 2024).

Continuing the analysis, I want to cite some elements, which result from the assessment of the political situation of Qatar from Freedom House in order to demonstrate the political situation in the country. According to their assessment, Qatar receives a score of 7 out of 40 for political rights and 18 out of 60 for civil liberties. This results in an overall score of 25 out of 100, categorising Qatar as a ''Not Free'' country. Regarding civilian liberties, documents from the U.S. Department of State highlight that the Qatari government has imposed restrictions, severely limiting the rights of its citizens (Freedom House, 2024). Moreover, according to Bertelsmann Stiftung's Transformation Index (2023), Qatar's political transformation is notably low, scoring approximately 3.85 on a scale of 1 to 10. This places Qatar 89th out of 139 countries, reflecting challenges in areas such as the rule of law, institutional systems and political participation (BTI, 2023).

In the past two years, corruption has emerged as a significant issue that Qatar needs to address. Specifically, Qatar's corruption index fell by about 5 points, from 63 in 2021 to 58 in 2022, ranking it 40th out of 180 countries. This decline is largely attributed to scandals surrounding the hosting of the 2022 World Cup. Reports indicate that Qatar exploited migrant workers during the construction of sports facilities for the event. According to *''The Guardian''*, since Qatar began preparations for the World Cup in 2010, approximately 6.500 workers have died due to poor working conditions (Ward, 2022).

In conclusion, the political situation in Qatar can be described as unstable. The government is reported to undermine citizens' rights and liberties, leading to significant restrictions and abuses. This situation suggests a pattern of manipulation and control that severely impacts the freedom and well-being of the population.

6.4.6 Conclusion

To conclude, Qatar qualifies as a rentier state, with rent accounting for over 40% of its government revenues. Although Qatar implemented some reductions in energy subsidies in 2016, it still maintains a subsidised energy sector. Moreover, in the labor market, the majority of the labor force is employed in the public sector. Finally, the political system is autocratic, severely restricting personal liberties and rights. In a nutshell, to foster rapid development, Qatar needs to revise its economic policies, diversify its economy, and adopt a more democratic approach

6.5 Qatar and energy Transition

6.5.1 Introduction

As concluded, Qatar is a rentier state, as it meets all those characteristics mentioned in the analysis of the RST. This raise the question of whether a state, which is so dependent on resource rents, will be able to adapt to the changes brought about by the energy transition. In this section, I will explore Qatar's strategies for energy transition, the initiatives it has undertaken to achieve this goal, and provide a brief literature review on the subject.

6.5.2 Energy Transition and Qatar's initiatives

Starting the analysis, I will focus on Qatar's plans for achieving sustainability and energy transition.

Qatar National Vision 2030, implemented during the reign of His Highness Sheikh Hamad bin Khalifa Al Thani, outlines ambitious goals for Qatar to address current and future challenges. Among these challenges, the most pertinent to energy transition is the achievement of ‘’economic growth, social development and environmental management’’. The Vision 2030 plan is structured around four pillars: human, social, economic and environmental. In this chapter, I will focus on the third and the fourth pillars.

As regards the economic pillar, Qatar can exploit its hydrocarbons by enhancing public services, strengthening the labor force and stimulating entrepreneurship and innovation. However, this goal faces two key challenges. The first challenge is encouraging the private sector to actively contribute to sustainable development. The second one is the creation of a pathway that will bring wealth and economic stability to Qatar. Additionally, the strategy includes goals for sound economic management, responsible exploitation of oil and gas and the effective economic diversification.

Regarding the environmental pillar, Qatar faces both local challenges, such as water scarcity, depletion of hydrocarbons, environmental degradation and pollution, as well as universal issues like global warming. Addressing these challenges requires a three-pronged approach: raising public awareness, and strengthening both the legal and institutional frameworks.

Qatar’s Renewable Energy Strategy outlines the country’s approach to implementing an environmentally friendly energy policy, while advancing its energy transition goals. The country has already concluded two National Development Strategies: the first covering the period from 2011 to 2016, and the second from 2018 to 2022, both aimed at supporting the objectives of the Renewable Energy Strategy. The goals of the strategy are the following:

- *Reduce CO2 emissions through sustainable policies and trends.*
- *Increase renewable energy penetration while maintaining grid reliability.*
- *Maximizing the socio-economic contribution from renewable energy sources program*

The first goal sees Qatar’s emissions reduction efforts as an opportunity to introduce a comprehensive plan for the development of renewable energy. To achieve this, Qatar

has launched the ’National Campaign for the Conservation and Efficient Use of Water and Electricity in Qatar’, a step-by-step initiative designed to support this transition

The first of the two goals focuses on the both electricity demand and production, which are central to Qatar’s strategy. To meet the anticipated future demand, it is crucial to develop facilities and infrastructure that support electricity generation. Qatar’s main goal is to increase the contribution of renewable energies to the power mix from 5% to 8%. Moreover, the strategy emphasises efforts to boost renewable energy penetration in the electricity sector, notably through the net-billing system that ‘’*enables prosumers to sell the surplus of electricity generated to the grid at a fixed price*’’.

The implementation of the third objective involves achieving two sub-objectives. The first one is related to the establishment of a local renewable energy market, specifically for large-scale solar PV projects. The second focuses on enhancing the capture of RES attributes, through the application of carbon offsets or renewable energy certificates, which aim to boost renewable energy usage and reduce carbon dioxide emissions in the atmosphere.

It is worth mentioning some of the key initiatives Qatar has undertaken to support its energy transition goals:

- Participation in COP26: In 2021, Qatar participated in COP26, in which His Excellency Sheikh Dr. Faleh bin Nasser bin Ahmed bin Ali Al Thani, Minister of Environment and Climate Change, stressed the need to address climate change challenges and set goals for the minimization of greenhouse gas emissions (Government Communication Office, 2021).
- Qatar Petroleum’s rebranding: Another initiative was Qatar Petroleum’s rebranding to Qatar Energy, signaling its commitment to the energy transition and its focus on promoting alternative forms of energy beyond oil (Kulovic, 2022).
- Siraj Energy project: In May 2022 it was announced that Siraj Energy would undertake the construction of 800MW photovoltaic (PV) power project in Qatar’s Al-Kharsaah area. This project aimed to reduce greenhouse gas emissions and lessen reliance on gas-based electricity generation. It featured dual panels, that enhance electricity output, as well as sun-tracking and robotic

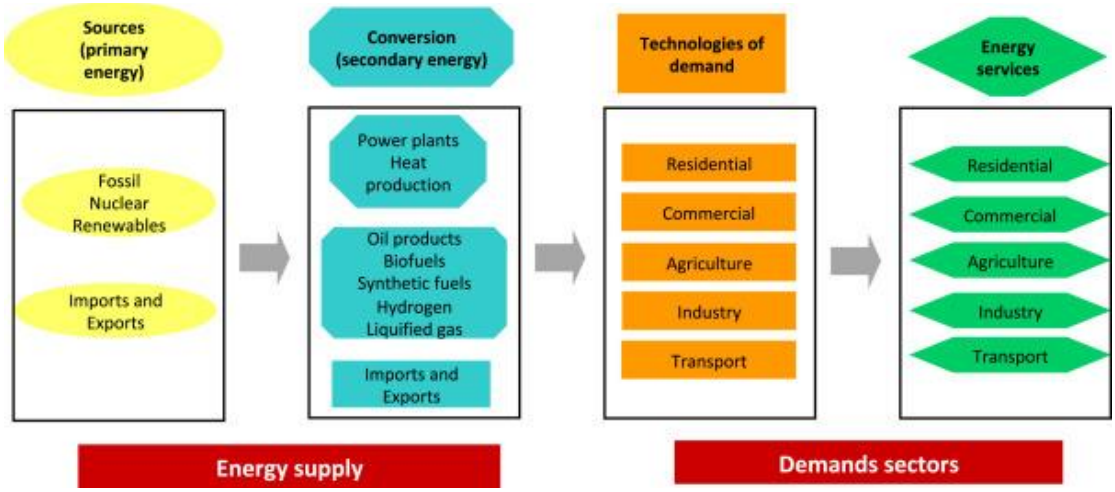
cleaning technologies that improve production efficiency. (Power Technology, 2023)

- Waste anagement center: Qatar has announced the creation of a new waste management center aimed at producing electricity through both recycling and waste processing. This initiative is important, as it will further the country's energy generation capacity, complementing existing efforts in the transition to more sustainable energy sources (Jones A. et al., 2023).

Finally, I want to cite the conclusions of some surveys, regarding Qatar's future energy transition and its efforts to adapt to emerging changes.

Babonneau et al. (2022) used the Energy Technology Environment Model (ETEM), a bottom-up model, to identify potential decisions Qatar could make concerning energy and technology based on its energy needs. The model is structured as shown in Figure 10, tracing the path from energy production to energy demand.

Figure 10: The path from energy production to energy demand.



Source: Babonneau F., Benlaherch M. Haurie A. (2022). Transition to zero-net emissions for Qatar: A policy based on Hydrogen and CO2 capture & storage development.

Thus, according to the results of this model, Qatar could achieve a net-zero strategy by 2070, through the following steps:

- Reinforce the integration of hybrid and electric cars and strengthen initiatives such as district cooling and solar energy production

- Achieve three goals after 2040: increase CO2 capture and storage capacity, particularly in the industrial sector, and boost the production of both ammonia and hydrogen

Al-Noaimi et al. (2023) analyze Qatar's economy, energy profile, consumption and production in comparison with other countries. Their conclusion highlights the need for Qatar to follow a long-term low-emission development strategy (LEDS). This strategy's strength lies in its focus on incremental short-term efforts and steps towards energy transition. It emphasises the importance of both mitigation and adaptation to emerging changes and explores new energy scenarios that could lead Qatar to decarbonization.

Finally, Abadli et al. (2022) offer three recommendations for Qatar to better adapt to energy transition, by examining energy demand, energy capacity and solar energy utilisation:

1. Transition from traditional methods: given the significant role on natural gas in electricity production, Qatar needs to overhaul its conventional methods of energy generation.
2. Reduce CO2 emissions: Qatar should focus on decreasing CO2 emissions, particularly through increased use of solar energy.
3. Enhance solar energy integration: incorporating solar energy into Qatar's energy profile is advantageous for the transition, since this approach, among other measures, will require generating subsidies to support its implementation

The findings from the three surveys suggest that Qatar is well-positioned to advance its energy transition and revamp its energy profile. In terms of the first survey, it is stressed that Qatar has to set a deadline by 2040, in order to achieve its 2050 and 2070 goals. These goals focus on developing new energy measures, which could introduce innovative energy types. The second survey supports the implementation of these goals through a Low-Emission Development Strategy (LEDS), which is considered the most feasible approach for Qatar. The third survey underlines the importance of using solar energy to reduce CO2 emissions CO2 emissions.

6.5.3 Conclusion

In conclusion, Qatar has undertaken numerous efforts to adapt to the new conditions brough about by the energy transition. Through both comprehensive plans and individual initiatives, the country aims to overhaul its energy policy, which has long been the foundation of its economy. Whether, through both comprehensive plans and individual initiatives, the country aims to overhaul its energy policy, which has long been the foundation of its economy be seen in the long term. Nevertheless, Qatar demonstrates a strong commitment to achieving its goals and advancing towards energy transition.

Chapter 7: The case of Algeria

7.1 Introduction

In this chapter, I will follow the same structure, as in the case of Qatar, aiming to achieve two distinct objectives. Firstly, I will demonstrate that Qatar is a rentier state, by analyzing its economy through macroeconomic indexes, and highlighting the most important aspects of the country's energy profile. Then, I will illustrate Qatar's rentier mentality by examining four factors: dependence on rent, energy subsidies, labor force, and its regime. Secondly, I will explore Qatar's efforts to adapt to the changes that the energy transition will bring

7.2 Macroeconomic analysis

7.2.1Introduction

In figure 9, I have compiled six macroeconomic indicators, in order to analyze Algeria's macroeconomic situation, from 2016 to 2023. As a general observation, these indicators display significant volatility, indicating that Algeria's economy lacks stability. To gain a deeper understanding of Algeria's economic landscape during this period, I will focus on one key event, namely the COVID pandemic in 2020, and I will explore other contributing factors that have shaped the country's macroeconomic indicators.

Figure 11: Macroeconomic indicators of Algeria

Algeria	2016	2017	2018	2019	2020	2021	2022	2023
GDP (current US billion $)	180,763	189,880	194,554	193,459	164,873	186,265	225,560	239,899
GDP growth (annual %)	3.9	1.5	1.4	0.9	-5.0	3.8	3.6	4.1
GDP per capita (current US$)	4,481	4,616	4,640	4,530	3.794	4.216	5,023	5,260
Inflation, consumer prices (annual %)	6.4	5.6	4.3	2.0	2.4	7.2	9.3	9.3
Current account balance (% of GDP)	-14.5	-11.6	-8.7	-8.8	-11.0	-12.4	8.6	2.3
Unemployment, total (% of total labor force) (modeled ILO estimated)	10.2	12.0	12.2	12.3	14.0	13.6	12.4	11.8

Source: World Bank data (2023)

7.2.1 GDP

Starting with GDP, from 2016 until 2019, Algeria's economy grew steadily, reaching $193.459 billion. However, the onset of the COVID-19 pandemic caused a sharp decline of approximately $30 billion, marking the lowest point during this period. From 2021 to 2023, the GDP rebounded significantly, driven not only by Algeria's ability to mitigate the pandemic impact but also by a strong recovery of hydrocarbon production. Additionally, the construction and service sectors experienced substantial growth during this time, further contributing to the economic recovery (African Development Bank Group, 2024).

7.2.2 GDP growth

Regarding GDP growth, the period from 2016 to 2019 shows a really slow increase. In 2020, However, there was a significant drop to -5%, reflecting the severe impact of COVID-19 on Algeria's economy. Nevertheless, over the next three years, GDP growth recovered, returning to positive levels. A notable surprise during this period was the shar increase in growth by 7.8%, which is closely linked to the rebound in hydrocarbon

production, as well as the recovery of other key economic sectors mentioned in the earlier GDP analysis.

7.2.3 GPD per capita

When discussing Qatar's GDP per capita, I stressed the significance of considering both the country's GDP and its population. Similarly, in the case of Algeria, it is crucial to note that the population has been increasing steadily. As a result, Algeria's GDP per capita has mirrored the overall movement of its GDP, reflecting the same trends in economic performance

7.2.4 Inflation

Regarding inflation, Algeria made significant progress in reducing the inflation rate during the 2016-2019 period. In 2020, there was a modest increase of 0,4%, reflecting the country's efforts to manage its economy, despite the challenges posed by pandemic. However, over the following three years, inflation surged dramatically, reaching 9.3% in 2023. This sharp rise can be attributed to several supply shocks Algeria faced, including those related to climate change, the pandemic and the global energy crisis (IMF, 2023)

7.2.5 Current account balance

Algeria's current account balance is of particular interest. From 2016 to 2021, it reached negative levels, with imports consistently exceeding exports. Notably, in 2016 it marked the lowest point in this period. However, in 2022 and 2023, exports surpassed imports, leading to a significant improvement in the current account balance. This recovery was largely driven by increased production and exports of hydrocarbons, which played a crucial role in boosting Algeria's trade balance.

7.2.6 Unemployment

The final indicator is unemployment, which spiked during the pandemic, reaching 14%. However, after 2020, the unemployment rate began to decline gradually. Despite this improvement, the fact that 1 in 10 people is still unable to find a job is not alarming, but does warrant attention for further economic development and job creation offers.

7.2.7 Conclusion

To conclude with, it is undeniable that COVID-19 had a significant impact on Algeria's economy. Moreover, inflation and unemployment have emerged as two of the country's

most pressing challenges. Inflation has been rising steadily, while unemployment remains persistently high, both of which require focused attention and strategic management to ensure long-term economic stability and growth.

7.3 Energy profile

7.3.1 Introduction

In order to understand Algeria's behavior as a rentier state, it is essential to analyze the country's energy profile. Specifically, I will examine several key aspects, including energy mix, energy production, energy consumption, energy trade and energy poverty in Algeria.

7.3.2 Energy mix

Natural gas is the predominant resource in Algeria's energy mix, accounting for 65.9%, followed by oil at 33.5%. Coal and renewable energies contribute only 0.4% and 0.1% respectively, highlighting Algeria's status as a natural gas dominated country. Moreover, from 2000 to 2021, There was a significant increase in the supply of both natural gas and oil, reaching 1.775.215 TJ and 902,997 TJ respectively, in 2021, whereas coal and renewable energies remained stable at low levels during this period (IEA, 2021).

7.3.3 Energy production

Regarding energy production, natural gas generation has experienced a significant increase of approximately 28% from 2000 to 2021, with an even more pronounced surge from 2020 to 2021, when production rose from 3.0202.010 TJ to 3.734.001 TJ. On the other hand, oil production declined by 10% in the same period. Notably, oil production surpassed that of natural gas in 2015 (IEA, 2021).

7.3.4 Energy consumption

According to Enerdata (2023), Algeria's energy consumption stands at 1.5 toe per capita, which is considered high. From 1990 to 2021, this consumption increases significantly by approximately 40,000 ktoe, rising from 21,127 ktoe to 61,827 ktoe. Natural gas and oil are the primary resources consumed, accounting for 41.3% and 40.9% of total consumption, respectively, while electricity also represents a substantial portion at 17%.

7.3.5 Energy trade

In Algeria's energy trade, petroleum gas is the most exported resource accounting for 46.7%, followed by crude petroleum at 27.4% and refined petroleum at 14.7%. The largest trading partners for Algeria's energy resources are Italy, France and Spain. This clearly indicates Algeria's intention to play an important role in the European energy market, a goal that it aims to achieve through liquefied natural gas (LNG) exports and its transformation via vessels (Observatory of Economic Complexity, 2022).

7.3.6 Energy poverty

Using the same survey referenced in the examination of Qatar's energy poverty, Algeria ranks 26th among 82 countries participating in China's 'One Belt, One Road' initiative, with an index of approximately 0.170. In comparison, Kuwait holds the top position with an index of around 0.480, while Cyprus, despite lacking significant energy resources, is actively seeking to exploit them. Interestingly, Algeria is more energy-rich than the Russian Federation, a country facing similar challenges in energy policy and economic growth as Algeria.

7.3.7 Conclusion

To conclude, Algeria is an important energy player not only in the Middle-East, but in the whole world. The country seeks to strengthen its energy sector by not only ensuring that energy supports the functioning of various domestic industries but also by leveraging energy as a strategic asset in international trade.

7.4 Is Algeria rentier state?

7.4.1 Introduction

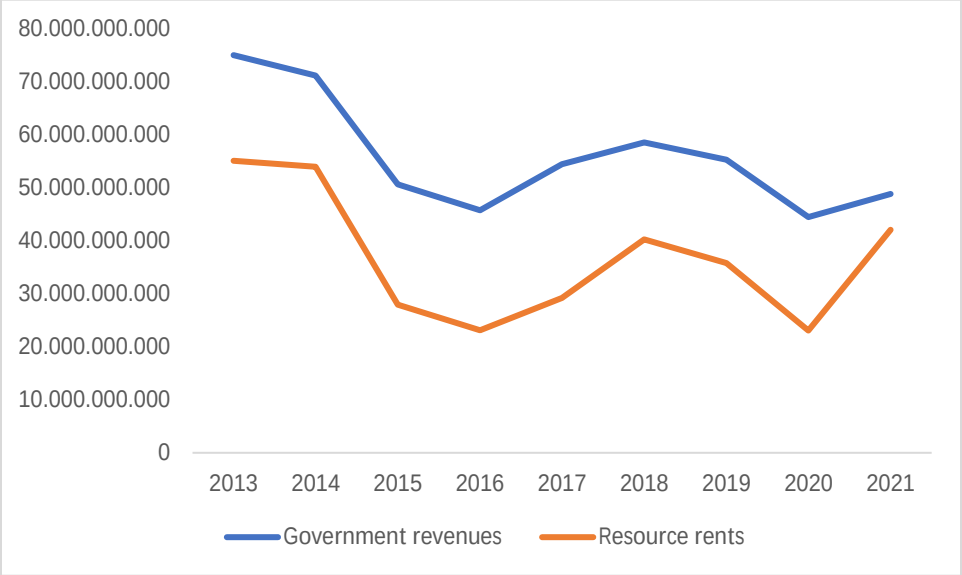
In this section of the chapter, I will assess whether Algeria qualifies as a rentier state based on its reliance on external rent. Moreover, I will discuss if its characteristics align with those of a rentier state, in the following areas: energy subsidies, labor market and the political situation.

7.4.2 Reliance on resource rents

In this unit, I will examine if the Algeria is a rentier state using the same method applied in the case of Qatar, specifically by calculating rent as a percentage of government revenues. The results, as they are shown in the figure 10 indicate that this percentage consistently exceeded the 50% threshold during the period from 2013 to 2021. The

highest percentage was 86.1%, while the lowest was 50.5%, resulting in an average of 64.4%. Thus, it is clear that Algeria qualifies as a rentier state, as rent as a percentage of government revenues surpassed the 40% threshold that Luciani (1987) established as a benchmark.

Figure 12: Algeria's rent as a % of government revenues



7.4.3 Energy subsidies

In Algeria, subsidiary policy is closely linked to two important elements: the '' welfare state'' and social justice (Arab Reform Initiative). However, the data indicates that this policy is quite intensive. According to IEA (2023), Algeria ranked as the 8th largest fossil fuel subsidizer in the world in 2021, with subsidies amounting to approximately $23 billion. The most heavily subsidized fuels include gas and electricity. However, as Boudaoud et al. (2023) have supported, the more the country adheres to a subsidiary policy, the more it undermines the generation of Renewable Energy Sources (RES). This is further illustrated by OECD data (2021) which indicates that in 2020, RES constituted only 0,129% of the total energy supply. Moreover, it seems that energy subsidies primarily benefit business owners and wealthier individuals (Boukhatem, 2024). Although Algeria could have reduced its subsidiary policy in 2020 following a significant decline in oil prices (Arab Reform Initiative), the reality is that oil subsidies still reached $5.8 billion, while electricity and gas subsidies amounted to $1.4 billion and $1.2 billion, respectively, according to Statista (2024). Implementing reforms to the subsidy system is challenging for two main reasons: first, the country's macroeconomic policy relies heavily on these subsidies, and, second, past attempts to

cut subsidies on foodstuffs in 2011 led to widespread protests among citizens against the government (Boudaoud, 2023).

7.4.4 Labor force

According to World Bank data, Algeria's labor force has grown significantly from 1991 to 2023, reaching 13.426.064 people, Or 29.4% of the population. Despite this growth, unemployment has remained high in recent years. Additionally, women make up 19.5% of the labor force, while men account for 81.5%, indicating a male-dominated labor market. In terms of Algeria's rentier state status, the country deviates from the typical pattern, as the private sector has been dominant since 1990, rather that the public sector, which is more common in rentier economies. Furthermore in 2011, the percentage of the labor force employed in the public sector decreased to 40%, while the private sector grew to encompass 60% of the labor force (European Trading Foundation, 2014). According to the International Monetary Fund (2024), public sector employment has increased in recent years, but still accounts for only 25% of the labor force, compared to 75% in the private sector. This sets Algeria apart from the typical rentier state model, as the country has actively sought to diversify its economy by strengthening the private sector, which is now a key generator of domestic revenue. Algeria's economic approach thus differs from what is expected from a rentier state.

7.4.5 Political situation

Algeria is a semi-president multiparty republic (U.S Department of State, 2018). The president, who serves as the head of the state, is elected every five years by the citizens (U.S Department of State, 2018). According to the constitution, the president has the authority to appoint or dismiss the cabinet and the prime minister, who serves as the head of the government (CIA). The Algerian government is bicameral, consisting of two chambers. The first is the National People's Assembly, whose chairman works with the president to make decisions, including appointing the chairman of the Council of Nations (the second chamber) and the prime minister. The Council of Nations is composed of two-thirds elected by municipal officials and one-third appointed by the president, consisting of prominent figures. Additionally, two key institutions play vital roles in governance: the Constitutional Council, which oversees the implementation of the constitution, and the Council of State, which has replaced the administrative chamber of the Supreme Court. Finally, Algeria has five advisory bodies: The High

Islamic Council, The Economic and Social National Council, The High Council of Amazighity, The Human Rights Observatory and The Higher Council of Arabic Language (Algerian Embassy in Malaysia).

Continuing the analysis, I will highlight key elements from Freedom House's (2024) assessment of Algeria, to illustrate the country's political situation. According to this assessment, Algeria scores 10 out of 40 for political rights and 22 out of 60 for civil liberties, giving it a total score of 32 out of 100, which classifies Algeria as a ''Not Free'' country. Moreover, The Bertelsmann Stiftung's Transformation Index (2023) ranks Algeria's political transformation at a low 4.60 on a scale of 1 to 10, placing the country 74th out of 137 sates. This assessment reflects Algeria's significant political challenges and limitations in terms of democratic governance.

One notable characteristic of Algeria's political situation is the restriction of freedom of expression, as illustrated by two incidents in 2022. First activist Faleh Hammoudi, head of the Algerian League for the Defense of Human Rights, was arrested and charged with ''offending public bodies'' and ''spreading fake news''. Second, Hakim Debbazi, an activist from the Hirak movement - a revolutionary movement in Algeria - died in custody after being arrested on similar charges. These cases highlight the Algerian government's use of its power to suppress dissent, imposing restrictions that curtail citizens' fundamental rights and freedoms (Human Rights Watch, 2023).

To conclude, it is obvious that, although the political regime of Algeria is semi-presidential, it operates as an autocracy that fails to fully respect the rights of its citizens.

7.4.6 Conclusion

In conclusion, Algeria qualifies as a rentier state because its resource rents consistently account for more than 40% of government revenues. Regarding energies subsidies, it is true that Algeria implements a subsidiary policy in the energy sector, and faces significant challenges in reforming this system for the reasons previously mentioned Moreover, the country operates under an autocratic political system, where citizens lack fundamental rights and liberties. However, the labor force is predominantly employed in the private sector, which contradicts the typical characteristics of a rentier state,

where the public sector usually dominates. In summary, while Algeria is a rentier state, it is making efforts to shift away from its rentier mentality.

7.5 Energy Transition

7.5.1 Introduction

As I have concluded, Qatar is a rentier state, as it meets all those characteristics outlined in the analysis of the RST. The key question that arises is whether a state so heavily reliant on resource rents can successfully adapt to the transformative changes that the global energy transition will bring. In this chapter, I will examine not only Algeria's strategies towards energy transition, the initiatives it has taken in order to achieve it and a brief literature review in terms of this issue

7.5.2 Algeria and energy transition

In this chapter, I will discuss Algeria's three main strategies aimed at facilitating its energy transition energy transition. The first strategy is the ''Renewable Energy and Energy Efficiency Development Plan 2011-2030'', initially adopted in 2011 and updated in 2015. The primary objective of this plan is to install 22.000MW of power production capacity, thereby increasing the share of renewable energy in Algeria's mix. According to the plan, electricity generation from RES is expected to reach 20% by 2030; additionally, the integration of renewables into the energy profile is projected to create new jobs. The plan also forecasts that by 2030, total national electricity generation will increase by approximately 37%. The implementation of this strategy is divided into three phases (Climate Change Laws of the World).

According to the second version of the Strategy of Algeria's ''Renewable Energy and Energy Efficiency Development Plan 2011-2030'', the country must prioritize renewable energies technologies, such as solar PV and wind, biomass, cogeneration and geothermal installations, in order to meet the target of 22,0000 MW by 2030. Thus, if this happens, renewable energy generation will make up 27% of total power production, significantly enhancing Algeria's energy diversification (IEA, 2017).

The second strategy is the ''Algeria Renewable Energy Program'', designed to reinforce the overarching goals of the ''Renewable Energy and Energy Efficiency Development Plan''. Its goals are the following:

1. Solar energy enhancement: This involves conducting technical specifications and studies, as well as establishing agreements to promote the deployment of solar energy at various sites across the country.
2. Provides advisory services: The program offers guidance on essential documents and agreements, including Power Purchase Agreements (PPAs).
3. Project management: This refers to the way the projects for the implementation of energy transition will be managed.

The first goal emphasizes the integration of solar energy into Algeria's energy mix, reinforcing the anticipated solar panel installations outlined in the previous strategy. The second goal addresses the legal and regulatory aspects of the energy transition, highlighting the need for Algeria to resolve various regulatory issues to facilitate this shift. The third goal focuses on ensuring coordination in the implementation of the targets. It is worth mentioning two other important foals of the ''Algeria Renewable Energy Program''. The first is to align Algeria's energy policy with ''Intended Nationally Determined Contributions'' (INDCs) submitted at COP21 in 2015, thereby committing to international climate goals. The goal is to establish a framework which will be attractive for investments in the private sector.

The third strategy is the ''Algerian Strategy on Green Hydrogen 2050'', which is still in its early stages, and detailed information on implementation is currently limited. This strategy aims to promote the integration of green hydrogen into Algeria's energy profile. The country is actively engaged in hydrogen research through institutions like the Research Center in Renewable Energies in Algeria. This initiative will drive Algeria to develop a comprehensive framework for effectively managing hydrogen production and utilization (Benmessaoud et al., 2024).

It is important to highlight some initiatives that Algeria has undertaken to facilitate its energy transition goals:

- Creation of the Ministry of Energy Transition and Renewable Energies: In 2020, the Algerian government established this ministry to effectively manage the country's adaptation to energy transition. This ministry is tasked with

implementing the necessary initiatives and ensuring the achievement of the targets outlined in the previous strategies (International Trade Administration).

- Strategic Partnerships: In 2021, Algeria established strategic partnerships with the USA, China, and Germany to advance renewable energy development. This collaboration focuses on developing technologies, storage systems, and installations, allowing Algeria to cooperate with major global powers and enhance it soft power (Energy Capital & Power, 2023).
- Solar Park Development: For the period 2023-2024, the Algerian government has initiated the establishment of a 30 MW solar park in Beni Ounif. This project aims to bolster solar energy production in the region (Energy Capital & Power, 2023).
- Solar Panel Manufacturing: Zergoun Green Energy and Militech Engineering have partnered to construct factories in the Quargi region for solar panel production. Thia initiative will serve as a driving force for the implementation of the ‘’Solar 100 MW’’ project, which aims to establish a total of 1,000 MW in solar energy production capacity (Energy Capital & Power, 2023, African Energy Portal, 2022).

Finally, I want to cite the conclusions of some surveys, regarding Algeria’s future energy transition and its efforts to adapt to emerging changes.

Himri et al. (2022), conducted a study on Algeria’s energy profile and concluded that the country has significant potential to contribute to energy transition. This potential is supported by its financial resources, technological capabilities, and storage capacity. Moreover, they recommend some measures that Algeria can follow in order to better adapt to energy transition, including:

- Construction of multipurpose damns;
- Water storage via hydropower;
- Use of nuclear energy to address the volatility associated with RES;
- Investment in clean energy technologies, particularly in coal usage and
- Development of shale gas resources

Hadjer et al. (2023), analyzed Algeria's cooperation with the European Union in the context of implementing energy transition and concluded that the European Union is an important partner of Algeria. Moreover, the authors made several proposals regarding the strengthening of cooperation between the two sides, including:

1. Enhancement of relations: Strengthening the dialogue between Algeria and the EU to align and achieve mutual interests;
2. Investment in renewable energy: Fostering investments in renewable energy sources in Algeria while maintaining collaboration in sectors like that of natural gas and
3. Participation in international energy markets: Implementing programs that facilitate Algeria's involvement in international energy markets, including the electricity market

Makhloufi et al. (2022), outline how Algeria can achieve 75% of renewable electricity in its energy mix by 2050, using two approaches: the levelized cost of electricity (LCOE) for various technologies that can generate electricity, and the EnergyPlan tool, which calculates the total cost of establishing renewable energies in a country. The results of this study are the following:

1. Renewable energies are not consistently available throughout the day, necessitating the continued operation of fossil fuel power plants by 2050;
2. Geothermal energy should be integrated into Algeria's energy mix, requiring investment in research and development for this resource.
3. To meet Algeria's goal of achieving a 27% share of renewable energy generation by 2030, the installation of 22 GW of renewable capacity is essential.
4. Achieving a 75% share of renewable energy sources by 2050 will necessitate a total installed renewable capacity of 238GW, while a 50% share will require 59 GW
5. The target of 75% renewable energy sources can be realized through advancements in technology, effective market design, and sustained economic growth

7.5.3 Conclusion

In conclusion, Algeria has made significant efforts to adapt to the new conditions brought about by the energy transition. Through both comprehensive plans and targeted initiatives, the country aims to revamp its energy policy, which has long been the foundation of its economy. The long-term impact of these changes remains to be seen. Nevertheless, Algeria is demonstrating a strong commitment to achieving its goals and advancing towards energy transition.

Chapter 8: Comparative analysis between Qatar and Algeria

8.1 Introduction

In this chapter I will compare the two countries in terms of both the rentier state characteristics and their approach to adapting to the energy transition. This comparison will highlight the profiles of two distinct types of rentier economies and their unique characteristics, while also examining whether, and to what extent, being rentier states prevents them from taking the necessary measures in order to adapt to the energy transition.

8.2 Comparison in terms of the rentier state characteristics

First, I will compare the two states, based on their characteristics as rentier states, focusing on their resource rents as a percentage of government revenues, their energy subsidies, labor market and political situation. Thus, the conclusions of the comparison are as follows:

1. It is evident that the average percentage of rent in government revenues for Qatar (78.9%) is higher than that of Algeria (64.4%). This indicates that Qatar is more reliant on external resource rents, making it more challenging for Qatar to diversify it compared to Algeria.
2. As previously examined, both countries follow a subsidiary policy. While the Qatari government attempted to reduce subsidies in 2016, this initiative proved ineffective. In contrast, the Algerian government has made no efforts to curtail subsidies due to the potential backlash from its citizens.
3. The labor market presents an intriguing contrast between the two countries. In Qatar, the majority of the labor force is employed in the public sector, which is typical of a rentier state, as outlined in Renter State Theory. Conversely, in Algeria, a larger percentage of the labor force is engaged in the private sector compared to the public sector.
4. In both cases, the political regimes are authoritarian, with citizens lacking liberties and rights, while issues such as corruption and the limitation of free expression are prevalent. It is important to clarify the following: Qatar operates under a monarchical regime, which inherently justifies the presence of these elements. Algeria, on the other hand, is a democratic state, but as the aforementioned issues suggest, it has become deeply eroded resembling an authoritarian regime.

8.3 Comparison in terms of adaptation to energy transition

Regarding their adaptation to energy transition, I will also compare the two countries in terms of the measures and the initiatives they have taken in order to shift their energy policies. Additionally, I will consider relevant literature that addresses their progress in this area. The conclusions from this comparison are the following:

1. Qatar through its *Qatar Vision 2030* and Qatar *Renewable Energy Strategy,* and Algeria, via *Renewable Energy and Energy Efficiency Development Plan 2011-2030, Algeria Renewable Energy Program* and *Algerian Strategy on Green Hydrogen 2050,* are both striving to adapt to climate change and diversify their energy mixes by integrating renewable energy solutions.
2. Both countries have taken significant initiatives to meet the targets outline in these plans, either through institutional reforms (like the creation of new ministries) or by launching new projects in renewable energy and sustainability.
3. The literature suggests both similarities and differences in the policies of these countries. In terms of similarities, both are encouraged to develop high-capacity renewable energy infrastructure and promote electricity generation. Regarding differences, Qatar is particularly focused on implementing a long-term low-emission development strategy and emphasizing solar energy promotion. In Algeria's case, there is a focus on developing technologies like Levelized Cost of Energy (LCOE) and strengthening cooperation with the European Union in the renewable energy sector.

8.4 Conclusion

In conclusion, the comparison between Qatar and Algeria clearly shows that Qatar exhibits the characteristics of a rentier state to a greater extent than Algeria, both in terms of resource rents as a percentage of government revenues and in aspects such as energy subsidies, the labor market, and the political landscape. It is evident that Qatar remains heavily dependent on external rent, making it difficult to achieve rapid development, independent of these revenues. On the other hand, Algeria, though also a rentier state, is actively working to transform its economic and energy profile, as demonstrated in the analysis so far. Moreover, both countries have tried to take the necessary measures to adapt to the energy transition. However, as highlighted in the

literature, there are additional changes each nation can still pursue to further advance their energy transition goals

Figure 13: Summary of Qatar's and Algeria's examination as rentier states and according to their adaptation in energy transition

	Qatar	Algeria
Rent as percentage of Government revenues	The average percentage of rent in government revenues for Qatar is 78.9%.	The average percentage of rent in government revenues Algeria is 64.4%.
Energy subsidies	It follows a subsidiary policy. Qatari government attempted to reduce subsidies in 2016.	It follows a subsidiary policy. Algerian government has made no efforts to curtail subsidies due to the potential backlash from its citizens.
Labor market	In Qatar, the majority of the labor force is employed in the public sector, which is typical of a rentier state, as outlined in Renter State Theory.	In Algeria, a larger percentage of the labor force is engaged in the private sector compared to the public sector.
Political situation	Qatar operates under a monarchical regime, which inherently justifies the presence of these elements.	Algeria, on the other hand, is a democratic state, but as the aforementioned issues suggest, it has become deeply eroded resembling an authoritarian regime.
Energy transition's plans	Qatar Vision 2030, Qatar Renewable Energy Strategy.	Renewable Energy and Energy Efficiency Development Plan 2011-2030, Algeria Renewable Energy Program and

		Algerian Strategy on Green Hydrogen 2050
Energy transition's initiatives	It has taken significant initiatives to meet the targets outline in these plans, either through institutional reforms or by launching new projects in renewable energy and sustainability.	It has taken significant initiatives to meet the targets outline in these plans, either through institutional reforms or by launching new projects in renewable energy and sustainability.
Literature review in energy transition	It is encouraged to develop high-capacity renewable energy infrastructure and promote electricity generation, while it is particularly focused on implementing a long-term low-emission development strategy and emphasizing solar energy promotion.	It is encouraged to develop high-capacity renewable energy infrastructure and promote electricity generation. Regarding differences, while there is a focus on developing technologies like Levelized Cost of Energy (LCOE) and strengthening cooperation with the European Union in the renewable energy sector.

Chapter 9: Conclusion

In this thesis, I examined the application of Rentier State Theory (RST) in two specific states, Qatar and Algeria, focusing on their efforts to adapt to energy transition. Through this analysis, I reached the following conclusion: Firstly, Rentier State Theory is a theory of International Political Economy which focuses on rentier states' reliance on external rent and their typically slow economic growth. According to the literature key factors in identifying a rentier state include energy subsidies, labor markets and political dynamics. However, RST has been criticized, particularly for its analysis of political factors. Secondly, Energy transition poses a significant challenge of the future as states must make considerable efforts to meet the goals set by the Paris Agreement. As analysed, most implications of energy transition are positive, which should motivate states to take the necessary measures for its implementation. However, the practical concerns remain somewhat ambiguous. Thirdly, the MENA region holds a critical geostrategic position, due to its vast oil and gas reserves. However, as demonstrated in the cases of Qatar and Algeria, the region's macroeconomic environment is marked by instability and volatility. Moreover, both Qatar and Algeria qualify as rentier states, with rent constituting over 40% of government revenues. However, the comparative analysis reveals a key distinction: Algeria deviates from traditional RST in its labor market, where most employees work in the private sector. Finally, both Qatar and Algeria are working to adapt to the energy transition by diversifying their energy mix and taking steps toward achieving this goal. Furthermore, the literature remains optimistic about the potential for both states to meet the objectives of the energy transition

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