CRANFIELD UNIVERSITY

RUBA ABDULLAH ALJARALLAH

# THE DILEMMA OF NATURAL RESOURCE DEPENDENCY IN GULF COUNTRIES

SCHOOL OF MANAGEMENT
PhD Programme

DOCTOR OF PHILOSOPHY
Academic Year 2014 - 2019

Supervisor: Dr Andrew Angus
August 2019

CRANFIELD UNIVERSITY

SCHOOL OF MANAGEMENT
PhD Programme

DOCTOR OF PHILOSOPHY

Academic Year 2014 - 2019

RUBA ABDULLAH ALJARALLAH

# The Dilemma of Natural Resource Dependency in Gulf Countries

Supervisor: Dr Andrew Angus
27 August 2019

This thesis is submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy

# ABSTRACT

Natural resources (NR) serve as useful inputs and vital raw materials for domestic industries, which stimulate and secure sustained economic growth and development. However, the notion that the richness of NR can be translated into a curse rather than a blessing has long been an overarching topic of research for both academics and policymakers. The wealth of NR has noticeable socioeconomic and political impacts that vary among resource-rich countries. Given the importance of the Gulf Countries and their dependency on income from NR, the present study thoroughly analyzes the socioeconomic and political aspects of NR dependency in Kuwait (KWT), the Kingdom of Saudi Arabia (KSA), and the United Arab Emirates (UAE).

Firstly, this study examines the economic aspects of NR dependency by taking per capita GDP (PGDP) and Total Factor Productivity (TFP) as dependent variables. Secondly, this study examines the political aspects of NR dependency by taking institutional quality as the dependent variable. Lastly, the present study examines the social aspects of NR dependency by taking human capital as the dependent variable. This study applies the Autoregressive Distributed Lag (ARDL) model and co-integration technique by using time-series data from 1984 to 2014. The results indicate that, in the long-run, dependency on NR has a positive impact on PGDP in the KSA and the UAE, but the relationship is insignificant in KWT. Then, it is found that NR dependency shows a positive impact on TFP in the KSA and a negative impact in KWT, while the relationship is insignificant in the UAE. The results reveal that, in the long-run, institutional quality deteriorates as a result of NR dependency in KWT, but this relation is insignificant in the KSA and the UAE. The results of co-integration illustrate that NR dependency dampens human capital in the three countries in the long-run.



**Keywords:** Natural resource rents; Resource curse; Institutional quality; Human capital; Total factor productivity; Gulf Countries; Kingdom of Saudi Arabia; Kuwait; United Arab Emirates

***JEL Classification:*** **B15; E02; E24; I25; O47; Q32; Q38**

# DEDICATION

*To my Late Father, Abdullah, who throughout his lifetime etched in the walls of my heart the importance of education. Dad, today I fulfilled my promise to you in the anniversary of the day that I lost you. I love you and I miss you.*

# ACKNOWLEDGEMENTS

First and foremost, I would like to thank Allah the most compassionate and the most merciful for helping me to complete this thesis.

Secondly, I would like to gratefully acknowledge various people who have been journeyed with me in recent years as I have worked on this thesis. I owe an enormous debt of gratitude to my mother, Nawal, for her endless support and prayers, and to my beautiful two children, Abdullah and Leen, for their care and appreciation. Through the struggles and trials of this journey they have been a constant source of joy and love. You have given me a lot and without you this thesis would have been impossible to complete. Thank you.

Special appreciation also goes to my husband, Nawaf, for his sacrifice and patience and for providing me with everything during the time of my PhD. I will certainly never forget the fact that he believed in me and this was my motivation behind the completion of this journey.

Thirdly, I would like to thank my supervisor, Dr. Andrew Angus, who has given me the trust, and guidance throughout the different stages of my PhD study.

Fourthly, I extend my profound thanks to the Government of Kuwait for the PhD Scholarship and the assistance that was provided throughout the study period.

Last but not the least, I heartily thank my dearest friend, Hessah, for her constant encouragement and laughter during all stages of this journey.

# TABLE OF CONTENTS

# LIST OF FIGURES

# LIST OF TABLES

# LIST OF ABBREVIATIONS

| | |
|---|---|
| **GCs** | Gulf Countries |
| **TFP** | Total Factor Productivity |
| **PGDP** | Per Capita GDP |
| **AIC** | Akaike Information Criterion |
| **SBC** | Schwarz Bayesian Criterion |
| **ARDL** | Autoregressive Distributed Lag |
| **RR** | Resource Rents (% of GDP) |
| **LO** | Law and Order |
| **CRP** | Corruption |
| **HC** | Human Capital |
| **IQ** | Institutional Quality |
| **WDI** | World Development Indicators |
| **WB** | World Bank |
| **K** | Capital Stock |
| **PWT** | Penn World Table |
| **ICRG** | International Country Risk Guide |
| **ADF** | Augmented Dickey-Fuller |
| **PP** | Phillips-Perron |
| **KWT** | Kuwait |
| **KSA** | Kingdom of Saudi Arabia |
| **UAE** | United Arab Emirates |
| **OPEC** | The Organization of the Petroleum Exporting Countries |

# 1

# INTRODUCTION

Basic economic theory and historical examples suggest that it is beneficial for a country to have a rich endowment of natural resources. However, the resource curse suggests otherwise. According to Ross (2015), “the resource curse might be defined as the adverse effects of a country’s natural resource wealth on its economic, social, or political well-being”.

An overall look at growth rates across developing countries, with stagnation in resource-rich Africa and rapid growth in resource-poor Asia, seems to confirm the resource curse (Moradbeigi and Law, 2017; Ahmed et al., 2016). Indeed, several empirical studies have documented the existence of the resource curse in other resource-rich countries (Gylfason et al., 1999; Sachs and Warner, 1999; 1995; Auty, 1990; Gelb, 1988, among others), but the case of the Gulf region is still up for debate.

Where detected, the resource curse seems to be particularly related to point resources, such as minerals and petroleum. This is because they are usually high-rent resources and can easily be controlled by small groups and rent-seekers in society compared with non-point resources, such as agricultural products, which are distributed over a larger area.

Ross (1999) found that natural resources are not naturally harmful to economic development; instead, they cause distortions that harm economic growth. Most studies have found that the resource curse is transmitted through the economy via crowding-out logic, whereby resource wealth crowds out growth-enhancing activity, thus affecting growth (Sovacool, 2010;

Welsch, 2008). Papyrakis and Gerlagh (2004) investigated the transmission channels and categorized them as corruption, schooling, investment, and trade: these are the means through which natural resource abundance affects growth negatively. For instance, high levels of point resources have been found to negatively affect governance measures, such as government effectiveness, political stability, corruption, or the rule of law (Oskenbayev et al., 2013; Busse and Groening, 2013; Bulte et al., 2005).

Many studies have tried to analyse these transmission channels but have found varying results. Many other important studies have found no evidence of the resource curse, such as the study by Lederman and Maloney (2008). They argued that the channels do not convincingly exist in many cases and that the existing cases of a curse are tentative and not robust to further scrutiny.

According to du Plessis and du Plessis (2006), the resource curse is problematic for several reasons. First, these resources are nonrenewable, and their rapid extraction can threaten the economic and political structure. Second, resource exports are relatively important in these resource-rich countries, as they may be the greatest source of economic growth and development. This makes the resource curse a particularly serious risk in Gulf Countries (GCs).

GCs are enjoying the benefits of large reserves of oil and the resulting oil windfalls. Oil has become the main revenue source that is linked to the overall wealth of GCs (Hvidt, 2013). Since the per capita GDP in GCs has increased recently, one might have a view that natural resources have been beneficial (Appendix A. includes the economic background of the selected Gulf Countries). In this regard, an examination of the significance of natural resource wealth and the possible impacts of the high dependency on this wealth on socioeconomic development is of great importance. Since the Gulf region is lacking such analysis in the literature, the present study bridges this gap.

The major approach in this study is to emphasize the three transmission channels of the resource curse, namely, its economic, political, and social drivers. Therefore, a deeper understanding of the resource curse hypothesis and its transmission mechanisms is needed in GCs. In the first study, the impact of natural resource dependence on Total Factor Productivity (TFP) and per capita GDP is examined to determine the general economic aspect of the resource curse phenomenon. Then, a detailed study of the effects of natural resource dependence on institutional quality is presented in the second study to cover the political aspect of the resource curse phenomenon. In the last study, dependency on natural resources are investigated to identify whether it has an effect on human capital in a resource-rich country as a way to cover the social aspect of the resource curse.

## 1.1 Research Background

The key aim of this thesis is to identify and illustrate the significance of the existence of non-renewable natural resource wealth and how the dependence on this wealth produces several challenges to the economy. Moreover, the thesis highlights whether these resources are a blessing or a curse in an approach to question the relevance of the resource curse phenomena in resource rich countries, and specifically in the three Gulf Countries: Kuwait, the Kingdom of Saudi Arabia and the United Arab Emirates. Addressing the challenges produced by natural resource wealth is essential, given the importance of these countries (see Appendix A.).

## 1.2 Aims and Objectives of the Study

To meet this aim, the following questions will be answered in three empirical chapters:

**The first main chapter:**

1. Do natural resources increase per capita GDP in the short-run and long-run in Gulf Countries?
2. Does institutional quality increase per capita GDP in the short-run and long-run in Gulf Countries?
3. Does human capital increase per capita GDP in the short-run and long-run in Gulf Countries?
4. Do natural resources advance Total Factor Productivity in the short-run and long-run in Gulf Countries?
5. Does institutional quality increase Total Factor Productivity in the short-run and long-run in Gulf Countries?
6. Does human capital increase Total Factor Productivity in the short-run and long-run in Gulf Countries?

**The second main chapter:**

7. Do natural resources improve institutional quality in the short-run and long-run in Gulf Countries?
8. Does human capital improve institutional quality in the short-run and long-run in Gulf Countries?

9. Does GDP per capita improve institutional quality in the short-run and long-run in Gulf Countries?

**The third main chapter:**

10. Do natural resources enhance human capital in the short-run and long-run in Gulf Countries?
11. Does institutional quality enrich human capital in the short-run and long-run in Gulf Countries?
12. Does GDP per capita increase human capital in the short-run and long-run in Gulf Countries?

To the author's knowledge, this study is the first of its nature to empirically cover the short- and long-run dimensions of natural resource dependency in Kuwait (KWT), the Kingdom of Saudi Arabia (KSA) and the United Arab Emirates (UAE).

## 1.3 Research Philosophy

It is assumed that the study adheres to positivism research philosophy, since in positivism studies, the researchers' role is limited to collecting and interpreting data objectively, and the findings are observable and measurable (Saunders, et al., 2012; Crowther and Lancaster, 2008).

## 1.4 Significance of the Research

This study builds its theoretical argument on the aspect of literature that studies the likelihood of the resource curse, or the impact of natural resource dependency on important macroeconomic factors, such as productivity, per capita GDP, institutional quality and human capital.

Over the past several decades, economists have examined the impact of natural resource abundance in resource rich and resource poor countries, but little attention has been paid towards Gulf Countries (GC) as they emerged as major global petroleum producers and exporters. The Gulf Countries have grabbed international attention because of their continuous upward trend of GDP and economic growth in the last few decades. Though economic growth has improved their standards of living, these improvements cannot be achieved without economic development. However, GC are experiencing political and economic issues as well as social challenges that threaten to disturb their capabilities to attain acceptable levels of sustainability and development in the long run.

The three Arabian Gulf economies studied (Kuwait, Saudi Arabia and the UAE) are highly dependent on non-renewable resources, which account for a high proportion of their GDP (OPEC, 2017). Accordingly, they are highly exposed to the problems of natural resource dependency, more so than the majority of other countries. Thus, this study investigated the dilemma of abundance of natural resources, the most important source of income, by focusing on economic, political and social aspects.

Most previous studies have mainly focused on the impact of natural resources on GDP growth. However, this study is novel because it analyses the impact on total factor productivity (TFP) and builds an argument that natural resources affect growth via TFP. Thus, this study contributes to the literature concerning the natural resource curse in that we identify the association between natural resources and productivity under a time-series basis.

This study also suggests that growth is not a sufficient proxy for development. Therefore, this study considers that it would be more appropriate to check the impact of natural resource rents on per capita GDP, as this variable represents each household and reflects the nation's standards of living. Furthermore, this study investigated the social and political perspectives of resource dependency, particularly looking to detect impacts on human capital and institutional quality.

To investigate these issues in both the short and long-run and to identify the different dynamics, an error correction model based on autoregressive distributed lag (ARDL) was constructed. The model was estimated for each individual country by using time-series data to target the anticipated differences between the countries. This was done instead of following the panel or cross-sectional data approaches, in which the estimated coefficients are not true representatives of each country's circumstances.

Therefore, this study plays an important role in presenting models that help in assessing the impact of the revenues from natural resources in the Kuwait, Saudi Arabia and UAE economies. Understanding the effects of natural resource wealth would help these countries to realize their conditions and achieve their desired growth and sustainability in the future.

The study could provide assistance to policy makers and authorities in selecting and implementing the most appropriate and effective policies that combat the potentially damaging impacts of natural resources, as well as guaranteeing sustainability and development in the future.

## 1.5 Research Gap and Novelty

The main contribution of this thesis is to clarify the significance of natural resource wealth when it exists in a country and the challenges it produces, with the aim that such analysis would give a new perspective to the question of the relevance of the resource curse phenomena in all resource rich countries, and specifically in the three Gulf Countries—Kuwait, the Kingdom of Saudi Arabia and the United Arab Emirates—as a reference to adopt and implement optimal policies in the future.

Numerous studies have been conducted about the resource curse. However, this study is novel in several ways:

First, only a limited number of studies have investigated the resource curse in resource rich countries found in the Middle East and North Africa (MENA) region. Accordingly, we have chosen three countries in this region, in terms of their economic and geo-political roles.

Second, most of the resource curse studies have focused on one aspect of this phenomena, either economic, social or political. However, this study examines all three aspects in the case study countries. This includes key variables; per capita GDP, TFP, human capital and institutional quality, which the literature shows are important determinants of economic growth but could be affected by a high economic dependency on natural resources.

Third, as the resource curse, and indeed resource dependency, is unique in every country and conditional on its own settings and experiences, this study revises our understanding of the resource curse (and dependency) phenomena in Gulf Countries.

Fourth, this study is the first of its nature that addresses the impacts of institutional quality on human capital and vice versa in the selected three countries. Earlier studies failed to look at the relationship that could exist between variables when tackling the problem of the resource curse. Knowledge of these relationships would influence future studies in this field. As has been noted, recent studies are more comprehensive and have been extended by incorporating different angles and variables in their empirical studies, in order to deliver more profound understandings into the relevance of the resource curse.

## 1.6 Thesis Outline and Main Findings

In order to accomplish the aims and objectives, this thesis comprises three key studies presented in three main chapters (Figure 1.1).

The first study in chapter two examines the economic impacts of natural resource dependency on per capita GDP and total factor productivity, taking into consideration the institutional quality and human capital as covariates. The autoregressive distributed lag (ARDL) model and co-integration technique are applied by using time-series data from 1984 to 2014.

The findings reveal that in the long-run, natural resource dependency has a significant positive impact on per capita GDP in the Kingdom of Saudi Arabia and the United Arab Emirates, but it is insignificant in the case of Kuwait. Moreover, natural resource dependency has a significant positive impact on TFP in the Kingdom of Saudi Arabia. However, the impact is negatively significant in the case of Kuwait and insignificant in the United Arab Emirates.

Next, in chapter three, the study follows the same empirical technique of the ARDL model and co-integration to examine the political impacts of natural resource dependency by taking institutional quality as the dependent variable. The results reveal that in the long-run, natural resource dependency weakens institutional quality in Kuwait, but this relationship is insignificant in the case of the Kingdom of Saudi Arabia and the United Arab Emirates.

Then, the study examines the social impacts of natural resource dependency in chapter four, by taking human capital as the dependent variable. The results of co-integration illustrate that natural resource dependency dampens human capital in Kuwait, the Kingdom of Saudi Arabia and the United Arab Emirates in the long-run. The findings in regard to the human capital are of great importance for formulating future policies. The damaging effects of natural resources on human capital in all cases should be seriously considered, most notably because of the importance of human capital to achieve sustainable development.

In addition, the study finds that the impacts of natural resource dependency are not limited to the long-run, but that it also has significant impacts on the socioeconomic and political aspects in the short-run, due to the fluctuations in resource rents.

Finally, chapter five covers the main findings and conclusions, with recommendations for governments and policy makers in Gulf Countries. It also addresses the study limitations and future research.

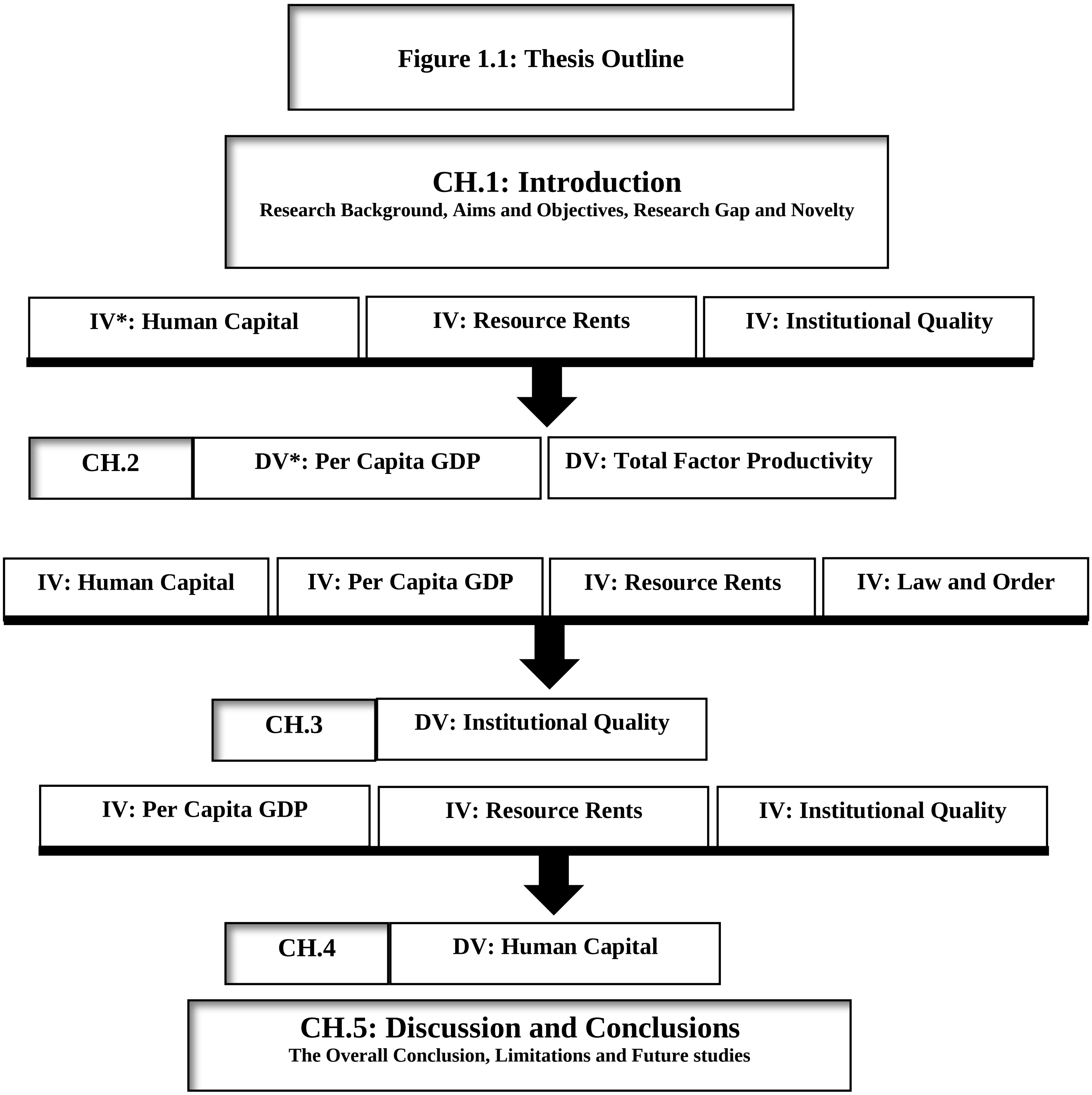



**Figure 1.1.** Thesis Outline
Source: calculated by the author
* Independent variables (IV) and Dependent Variable (DV)

# 2

# THE SHORT- AND LONG-TERM IMPACTS OF NATURAL RESOURCES ON PER CAPITA GDP AND PRODUCTIVITY IN GULF COUNTRIES

## 2.1 Introduction

Several countries in the Middle East and North Africa are blessed with nonrenewable natural resources, and yet they show low levels of productivity and poor development outcomes and economic growth when compared with resource-poor countries, such as East Asian economies (Oyinlola et al., 2015; Arezki and Nabli, 2012; Frankel, 2012). This condition is known as the “natural resource curse” (Auty, 1993), which encompasses a set of social, economic, and political challenges that are unique to countries that are rich in oil, gas, and minerals (Ross, 2015).

There is now a vast body of literature on this phenomenon and multiple explanations for how, why, and when a resource curse is likely to occur. Influential studies by Sachs and Warner (1997, 1995) supported the resource curse phenomenon by confirming that economic growth was negatively correlated with natural resource endowments. However, a universally accepted theory of the resource curse is lacking, although most explanations of the resource curse apply a crowding-out logic. This concept was simplified by Sachs and Warner (2001), who characterized it as the process in which natural resources crowd out growth-enhancing economic activities.

New approaches and explanations for the resource curse have been added to the literature (Badeeb et al., 2017). Although it is of great significance to study the relationship between natural resources and overall growth, there is a need to identify the different aspects, mechanisms, or transmission channels through which the curse works (Pendergast et al., 2011; Papyrakis and Gerlagh, 2004). In other words, natural resources can affect growth through their effect on the determinants of growth, such as productivity (Farhadi et al., 2015), institutional quality (Pendergast et al., 2011), and human capital (Akpan and Chuku, 2014).

A sizable number of studies have emphasized the impacts of the resource curse on economic growth. However, this paper focuses on productivity as a transmission channel for the resource curse, following studies such as Farhadi et al. (2015), Gylfason and Zoega (2006), and Papyrakis and Gerlagh (2004). Productivity is considered to be a key determinant of economic growth, so high productivity means the high-growth performance of GDP. It has been observed that the differences in Total Factor Productivity (TFP) between countries explain the differences in GDP growth rates (Dasgupta et al., 2005; Easterly and Levine, 2001).

The resource curse hypothesis was initially discussed in the context of the Dutch disease mechanism: productivity plays an important role in explaining this mechanism and its effect on growth (Harding and Venables, 2013; Ismail, 2010). Therefore, TFP has been regarded as a significant transmission channel since the resource curse was first hypothesized. It has been observed that the over-reliance on natural resources causes productivity differences between different sectors of the economy. Over-investment in the resource sector causes neglect of the tradable sectors that are more beneficial for long-term growth, leading to a decline in TFP and, consequently, diminished growth (Corden 1984; Corden and Neary 1982).

Additionally, it is apparent under the resource curse hypothesis that institutional quality and human capital also affect productivity because of the existence of natural resources (Arezki et al., 2012; Arezki et al., 2011; Gylfason et al., 1999). Institutional quality is a concept that captures the effectiveness of the law, individual rights, and government regulations and services (Hodgson, 2006; Knack and Keefer, 1995). human capital is the skills and knowledge that individuals build, maintain, and practice (Armstrong, 2006; Romer, 1990).

Furthermore, four main sources of human capital were distinguished by Becker (1962): on-the-job training, schooling, information, and health. These four factors develop the mental and physical abilities of individuals, thus fostering their productivity as well as their wages.

A particular problem in resource-rich countries is that governments commonly neglect institutions and human capital because of a false sense of security imbued by high resource revenues (Gylfason, 2001). Huge windfalls of resource revenues discourage the need for education and distort investments in human capital since jobs in the resource sectors are accessible and require lower-skilled and lower-qualified human capital compared with the tradable sector (Stijns, 2006; Bravo-Ortega and De Gregorio, 2005). Moreover, these huge windfalls pave the way for corruption and bribery (Faria et al., 2016; Tebaldi and Elmslie, 2013; Dias and Tebaldi, 2012). As a result of these factors, TFP is negatively affected and, in turn, reduces GDP growth (Papyrakis and Gerlagh 2004).

This raises the question of whether human capital or institutional quality have any effect on TFP and per capita GDP in a resource-rich country, a topic that has received relatively little attention. While some studies have investigated the separate effect of either natural resources (Badeeb and Lean, 2017; Farhadi et al., 2015), human capital (Alvi and Ahmed, 2014), or institutional quality (Tebaldi and Elmslie, 2013) on economic growth or the effect of natural resources on human capital and institutional quality (Akpan and Chuku, 2014), no study has considered the possible effect of human capital or institutional quality on TFP, especially in resource-rich countries.

Furthermore, this paper focuses on resource-based economies that are located in the Gulf region: Kuwait (KWT hereinafter), the Kingdom of Saudi Arabia (KSA hereinafter), and the United Arab Emirates (UAE hereinafter). These Gulf Countries (GCs) are relatively oil-rich, and oil revenues generally account for almost half of their GDP and government income, which tends to make them over-reliant on petroleum production and export, vulnerable to the volatile global oil market (IMF, 2019), and prime hosts for the resource curse (see Appendix A.). The present study is the first attempt to investigate the direct short-term and long-term impacts of natural resources, human capital, and institutional quality on total factor productivity and per capita GDP in Gulf Countries by using a time-series approach with data from 1984 to 2014.

The paper is organized as follows. Section 2.2 begins with a literature review, and details related to the data and methodology are provided in section 2.3. Section 2.4 presents the results and discussions, and concluding statements are provided in section 2.5.

## 2.2 Literature Review

Ross (2015) defined the resource curse (RC) as "the adverse effects of a country's natural resource wealth on its economic, social, or political well-being". The existence of the RC has been shown in several studies (Shahbaz et al., 2019; Badeeb et al., 2017; Moradbeigi and Law, 2017; Ahmed et al., 2016; Cockx and Francken, 2016; Apergis et al., 2014; Crivelli and Gupta, 2014; Sarmidi et al., 2014; Satti et al., 2014; Shao and Yang, 2014; Williams, 2011; Butkiewicz and Yanikkaya, 2010; Behbudi et al., 2010; Van der Ploeg and Venables, 2009; Papyrakis and Gerlagh, 2007; Gylfason and Zoega, 2006; Sala-i-Martin, et al., 2004; Birdsall and Hamoudi, 2002; Sachs and Warner, 2001, 1999, 1997, 1995; Sala-i-Martin, 1997). However, since the late 1980s, a growing number of empirical papers, covering different time periods and geographic areas, have challenged the existence of the RC in developing countries (James, 2015; Oyinlola et al., 2015; Ji et al., 2014; Hamdi and Sbia, 2013a; Yuxiang and Chen, 2011; Michaels, 2011; Cavalcanti et al., 2011; Arezki and Van der Ploeg, 2011; Boyce and Emery, 2011; Alexeev and Conrad, 2009; Brunnschweiler, 2008; Brunnschweiler and Bulte, 2008; Stevens and Dietsche, 2008; Gylfason and Zoega, 2006; Ding and Field, 2005; Neumayer, 2004).

In a recent study by Shahbaz et al. (2019), the authors found that natural resource abundance benefits growth, while natural resource dependence depresses economic growth and development. The authors' finding is supported by Taguchi and Lar (2016), James and Aadland (2011), and Atkinson and Hamilton (2003). Shahbaz et al. (2019) differentiated between resource abundance and resource dependence. Resource abundance refers to the endowments of natural resources as measured by the annual per capita rents of resource production (Apergis and Payne, 2014; Brunnschweiler, 2008). Resource dependence refers to the case in which natural resource extraction and export form the major source of revenues in a country, and it can be measured in three different ways: the share of total natural resource exports in GDP (Boschini et al., 2013; Sachs and Warner, 1995), the share of natural resource exports in total exports (Dietz et al., 2007), or rents from natural resources over GDP (Bhattacharyya and Hodler, 2014; Auty, 2007).

According to Arezki and Van der Ploeg (2011), there have been no serious efforts to disentangle the reasons behind the adverse effect of resources on growth. Hence, several authors have shown that there is a pressing need to identify the different aspects or transmission channels through which the curse works. Here, transmission channels are taken to mean the channels through which rents from natural resources affect the determinants of growth, i.e., productivity, institutional quality, and social and human capital. This study focuses on productivity.

Productivity, as measured by TFP, is the key driver of economic growth, so higher productivity means higher economic growth (Caselli, 2005; Hall and Jones, 1999; Solow, 1957; Abramovitz, 1956). TFP is the portion of output that is not explained by the volume of inputs used in production (Comin, 2017). As indicated by Klenow and Rodriguez-Clare (1997), around 90% of the differences in income per capita between countries can be described by differences in productivity. Their finding is supported by Dasgupta et al. (2005) and Easterly and Levine (2001). Productivity is determined by natural resources (Badeeb and Lean, 2017), human capital (Kumar and Chen, 2013), and institutional quality (Tebaldi, 2016).

An increasing number of studies have looked at the impact of natural resource dependence on TFP (Badeeb and Lean, 2017; Farhadi et al., 2015; Chen, 2012; Gylfason and Zoega, 2006; Papyrakis and Gerlagh, 2004) and concluded that natural resources have a negative impact on productivity.

Some papers have described the possible ways in which natural resources affect TFP, highlighting that natural resources cause an overinvestment and expenditures in the energy sector and the neglect of tradeable sectors, such as the manufacturing sector, that are beneficial for productivity and growth (Papyrakis and Gerlagh, 2004; Corden, 1984; Corden and Neary, 1982). According to Singer (1950), manufacturing encourages technical skills and knowledge and offers more spillovers compared with trading in natural resources. Part of this relationship between natural resources and growth was explained under a phenomenon known as the Dutch disease (Sala-i-Martin and Subramanian, 2013; Sandbu, 2006; Torvik, 2002; Sachs and Warner, 2001, 1999). The Dutch disease is a macroeconomic phenomenon that reflects changes in the structure of production and the economy in the wake of a favorable economic shock, including the discovery of large reserves of natural resource, a rise in commodities prices, sustained aid or capital flows, or any other external factor causing a windfall gain (Corden, 1984). As mentioned by Sandbu (2006), the Dutch disease refers to the contraction of the tradable sectors in the Netherlands after the discovery of gas in the North Sea in 1959.

Recent studies that have focused on the impact of natural resources on economic growth have attempted to determine whether dynamic relationships may exist among the variables (Shahbaz et al., 2018; Hamdi and Sbi, 2013a, 2013b). For instance, Shahbaz et al. (2018)

evaluated the impacts of natural resources on financial development in the United States using autoregressive distributed lag (ARDL) bound testing and controlling for education, capital, and economic growth. The study confirmed the existence of a long-run relationship between all the variables, with mainly positive effects of natural resources, education, and growth on financial development.

Hamdi and Sbia (2013b) analyzed the dynamic relationship between natural resource rents and Algeria's growth and found that natural resource rents and trade openness contribute positively and significantly to growth. Another study by Hamdi and Sbia (2013a) was conducted on Bahrain by examining the interrelationship between oil revenues, government expenditures, and GDP. The oil revenues showed a positive impact on growth, leading the authors to conclude that oil revenues remain the main channel that funds government expenditures and the main source of growth in a resource-rich country such as Bahrain. By using the ARDL model, Satti et al. (2014) confirmed the existence of the resource curse in Venezuela after the authors examined the link between natural resources, financial development, economic growth, trade openness, and capital stock.

To date, there is no consensus on the nature of the relationship between productivity and the factors that determine this productivity (Tebaldi, 2016). Several studies have highlighted this as an important avenue for future research, currently, much work is being devoted to the impact of human capital, institutional quality (Tebaldi, 2016), and natural resources (Badeeb and Lean, 2017) on TFP and per capita GDP in developing countries. On another note, a universally accepted theory of the resource curse is lacking, although most explanations of the resource curse rely on a crowding-out logic, which, as simplified by Sachs and Warner

(2001), is when natural resources crowd out certain activities that drive growth. In this case, natural resources harm growth. Hence, there may be evidence for the resource curse for TFP and per capita GDP because these factors are important determinants of growth (Badeeb and Lean, 2017; Farhadi et al., 2015).

Several scholars have provided empirical support for the positive and significant effect of human capital on TFP (Kumar and Chen, 2013; Liberto et al., 2011; Aiyar and Feyrer 2002; Benhabib and Spiegel 1994). It has been suggested that, theoretically, human capital affects TFP positively in different ways. First, human capital and education specifically help people build skills and knowledge that facilitate the adoption and implementation of new technologies (Romer, 1990; Nelson and Phelps, 1966). Second, human capital facilitates the local production of industrial or technical inventions (Aghion and Howitt, 1998; Romer, 1990), thus supporting the proficiency for self-sustaining development. Empirically, it has been found that education, capital flows, and research and development affect TFP growth (Cameron, 1998; Griliches, 1992). Moreover, it has been found that human capital in the form of employee training is important for TFP because skilled workers are more productive (Barrett and O'Connell, 1999; Hall and Kramarz, 1998). High returns to education reflect higher productivity, as Psacharopoulos and Patrinos (2004) found that an additional year of schooling leads to an average 10% increase in wages.

Miller and Upadhyay (2002, 2000) showed that the effect of human capital in terms of education is positive only at middle-income levels, while the effect is negative in low-income countries. The logic that supports the positive link between education and productivity is that labor skills affect productivity positively because of their inherent contributions to innovation, technological change, and capital productivity. Higher labor skills increase the capability of benefiting from international capital flows and trade, hence stronger TFP (Loko and Diouf, 2009). Public health is also considered to be part of human capital, and many studies have confirmed that healthy workers are more productive (Cole and Neumayer, 2006; Dasgupta and Ray, 1991). Both aspects of human capital—health and education—have been found to be positively related to TFP (Kumar and Chen, 2013).

On the contrary, Akinlo and Adejumo (2016) found that human capital is negatively associated with TFP, but they attributed their result to the lack of a skilled-based education system or to the deteriorating quality of education in Nigeria: these circumstances disturb the adoption and implementation of foreign technology and innovation. Moreover, a negative relationship between human capital and TFP was found to be associated with a low level of income, as reported by Miller and Upadhyay (2002, 2000). Kumar and Kober (2012) found that education has an insignificant impact on TFP. This suggests that the positive relationship is not absolute, particularly in low-income nations that are known for low government spending on education, low investment in research and development, low school enrolment, and poor quality of education.

Growth theory has highlighted that institutions are important for growth and development (Acemoglu and Robinson, 2010; Acemoglu et al., 2001; Hall and Jones, 1999). First, it is essential to address the definition of institutions and their role. Institutions are defined as the rules of the game in an organization, and they enforce restrictions that structure individuals' interactions (North, 1990).

Institutional quality has been shown to be an important determinant of TFP (Tebaldi, 2016). The rationale is that institutions play an important role in improving the efficient use and allocation of resources and production factors (Acemoglu and Robinson, 2010; Butkiewicz and Yanukkaya, 2006; Pattillo, et al., 2004), as well as fostering innovation and technological change (Dias and Tebaldi, 2012; Acemoglu et al., 2005; Hall and Jones, 1999). The results of another study conducted in resource-rich countries showed that higher institutional quality causes higher productivity (Farhadi et al., 2015). Hall and Jones (1999) highlighted the idea that differences in institutions result in the variation in per capita GDP and productivity among countries. Furthermore, the cross-country differences in technological innovation were found to be related to the institutional arrangements in every country (Tebaldi and Elmslie, 2013).

Poorly managed institutions may cause the misallocation of factors of production between economic sectors and organizations. They may also push economic agents to participate in unproductive actions such as rent-seekingand theft (Tebaldi and Elmslie, 2013; Hsieh and Klenow, 2007). A well-functioning economy needs institutions that secure property rights, enforce contracts, limit the power of rulers, maintain the rule of law, control corruption, and support political stability (Knack and Keefer, 1995). The absence of secured and well-defined property rights leads to the failure of any investment in research and development, the hindrance of human and physical capital accumulation, and hence, suppressed productivity and growth (Acemoglu and Robinson, 2010; Nachega and Fontaine, 2006). Moreover, political instability harms growth because it spreads uncertainty in the economy and distresses the business environment, and these circumstances decrease incentives to invest

(Aisen and Veiga, 2011; Alesina et al., 1996; Alesina and Perotti, 1996). It has been argued that the neglect of property rights and corruption are detrimental to growth (Ehrlich and Lui, 1999).

Some empirical studies have substantiated the adverse impact of corruption on productivity. Corruption, as an important measure of institutional quality, was defined by Aidt (2003) as the use of public power for individual interest, so it affects the economy negatively (Aidt et al., 2008; Lambsdorff, 2007; Meon and Sekkat, 2005; Mo, 2001). Corruption undermines growth and development through a few channels. As classified by Tanzi and Davoodi (1997), corruption lowers government revenues, lowers the quality of public infrastructure, and raises public investment. Also, corruption reduces private investment and affects government expenditures and investments (Mauro, 1995). The most noticeable sign of the adverse impact of corruption on productivity is 'white-elephant' projects. These projects are exceptionally expensive, with little or no benefits, and they are known to neglect public demand (Mauro, 1997). Another explanation of the lowered productivity due to corruption is that the best-connected contractors who probably paid bribes are selected instead of the contractors offering the best product. Corruption also affects the quality of government investments because of the lack of quality control contracts that ensure the level of quality of these investments. Lastly, corruption causes rent-seeking, inefficiency, and the misleading of public decisions, consequently decreasing the government's willingness or ability to improve public welfare (Rose-Ackerman and Palifka, 2016; Lambsdorff, 2002; Bardhan, 1997).

Looking beyond the general picture of the resource curse, scholars have specifically examined the impact of natural resources on per capita GDP. Several studies have found that oil-rich countries, on average, have high per capita GDP and poor institutions relative to advanced economies (Alexeev and Conrad, 2009). From their empirical evidence, Alexeev and Conrad (2009) found that large endowments of natural resources (e.g., oil or minerals) do not hinder long-term economic growth. Their analysis focused on per capita GDP instead of growth rates over a given period of time. They found that natural resource endowments increase per capita GDP and income inequality. In related work, Smith (2015) found no evidence to support the resource curse hypothesis: instead, resource exploitation was found to have a positive impact on long-run per capita GDP growth in developing countries and no impact in developed ones. Bravo-Ortega and De Gregorio (2005) found that natural resources have a negative impact on growth rates but a positive impact on income. However, Arezki and Van der Ploeg (2011) concluded that resource exports, as well as resource abundance, dampen per capita GDP.

Furthermore, natural resource endowments and per capita GDP have been linked through institutions (Easterly and Levine, 2003; Acemoglu et al., 2001). Hence, the relationship between institutional quality and per capita GDP is important to consider in a resource-rich country. A number of scholars have supported the fact that the selected measure of property rights, the rule of law, and corruption are related to the growth of per capita GDP (Dollar and Kraay, 2000; Sala-i-Martin, 1997; Knack and Keefer, 1995; Mauro, 1995). It has been confirmed that adherence to the rule of law, which has been revealed to translate to the absence of corruption and the protection of property rights, causes an increase in per capita GDP and is essential for growth (Dollar and Kraay, 2000; Knack and Keefer, 1995). Igwike et al. (2012) examined the association between per capita GDP and corruption and concluded that higher corruption could lead to lower growth and vice versa. The authors asserted that no consensus had been reached about the direction of causality between per capita GDP and corruption. However, Paiders (2008) found no relationship between changes in the Corruption Perception Index (CPI) and per capita GDP.

The impact of human capital in terms of education on per capita GDP has been examined in a number of empirical studies (McDonald and Roberts 2002; Knowles and Owen 1995). The weak relationship that was observed between education and per capita GDP has led to a debate of whether education affects per capita GDP indirectly through its impact on TFP or directly as a factor of production (Lucas, 1990; Nelson and Phelps, 1966). Faruq and Taylor (2011) found that the quality of education has more beneficial effects on per capita GDP in countries with better institutional environments.

Overall, this chapter examines the likelihood of the resource curse effect on different macroeconomic factors by paying particular attention to TFP and per capita GDP. This study is the first attempt to identify the relationship between natural resource dependence, productivity, and per capita GDP by using a time-series approach. Panel data have been used in previous studies, such as Farhadi et al. (2015), and their results were the motivation for choosing the time-series framework to examine these relationships among factors on a country-specific basis. According to Singh (2008), a time-series study is more suitable for estimating these relationships.

## 2.3 Research Methodology and Data

The Autoregressive Distributed Lag (ARDL) framework (Pesaran et al. 2001; Pesaran and Shin 1999) is an appropriate choice in this study because, while other co-integration techniques require that all regressors be integrated of the same order, the ARDL approach has one advantage in this regard: it can be applied regardless of the regressors' order of integration (Pesaran et al., 2001). Thus, ARDL is perfect for dealing with variables that are integrated of different orders: I(0) or I(1) or a combination of both. Thus, it prevents the problems that are related to the standard co-integration test, which requires the classification of the variables into I(0) and I(1). If there is one co-integrating vector, then the ARDL approach to co-integration or bound procedure for a long-run relationship should be selected because Johansen and Juselius's (1990) co-integration procedure is not applicable. In this circumstance, the ARDL approach to co-integration provides efficient and realistic estimates. In contrast to the co-integration procedure of Johansen and Juselius (1990), the ARDL model for co-integration facilitates the recognition of co-integrating vector(s). Namely, each of the underlying variables is regarded as a single long-run relationship equation.

Additionally, the ARDL model's popularity has increased in applied time-series econometrics because it appears that co-integration for nonstationary variables serves as an error-correction mechanism (ECM). The ECM model can be derived from the ARDL model through a simple linear transformation that integrates long-run equilibrium with short-run adjustments, without losing long-run information. The ECM incorporates sufficient numbers of 'lags' for the purpose of capturing the data that generate the progression in a general-to-specific modeling framework (Nkoro and Uko, 2016; Hassler and Wolters, 2006).

Differencing and generating a linear combination of nonstationary data convert all variables equally into an error-correction mechanism with stationary time-series only.

ARDL is also a preferred model when there is a single long-run relationship between variables in a small sample size. If the F-statistic (Wald test) determines that there is a single long-run relationship in a small or finite sample size, then applying the ARDL approach is more efficient.

### 2.3.1 Theoretical Model

The concept of "neutrality" in technological change has been found to be the most sophisticated and beneficial approach in economic growth models (Jones, 1965). According to this view, technological progress is neutral if it leaves the capital–output ratio unaffected at a certain rate of profit (Jones, 1965; Solow, 1962, 1956).

Solow (1956) presented a framework for analyzing the causes and dynamics of economic growth and then divided the growth rate of the aggregate output between factors of production and technological changes. Solow used the specification of the production function with Hicks-neutral technology because the change does not affect the balance of labor and capital; it only affects technological progress. Recently, this approach was used by Chen (2012) and Alvi and Ahmed (2014).

$$Y(t) = A(t). F\ [K(t), L(t)] \tag{2.1}$$

where Y(t) is the level of aggregate output, K(t) is the level of capital stock, and L(t) represents the labor force in the economy. A(t) represents the level of technology. To obtain the expression for per capita output, we use the Cobb–Douglas production function.

$$Y_t = AK_t^{\alpha} L_t^{\beta} \tag{2.2}$$

where α and β represent the shares of capital and labor in total output. The production function is assumed to depict a constant return to scale. To obtain the per capita output form, we divide both sides of Equation (2.2) by $L_t$:

$$\frac{Y_t}{L_t} = AK_t^{\alpha} L_t^{\beta} \frac{1}{L_t} \tag{2.3}$$

Next, by multiplying and dividing $L_t^{\alpha}$ and $L_t^{\beta}$, respectively, in Equation (2.3), we get the following form:

$$\frac{Y_t}{L_t} = A\left(\frac{K_t^{\alpha}}{L_t^{\alpha}}\right) L_t^{\alpha} \left(\frac{L_t^{\beta}}{L_t^{\beta}}\right) L_t^{\beta} \frac{1}{L_t} \tag{2.4}$$

where $\frac{Y_t}{L_t} = y_t, \quad \frac{K_t^{\alpha}}{L_t^{\alpha}} = k_t^{\alpha}, \quad \frac{L_t^{\beta}}{L_t^{\beta}} = 1$

$$y_t = A\, k_t^{\alpha}\, L_t^{\alpha} L_t^{\beta} \frac{1}{L_t} \tag{2.5}$$

By imposing the condition of $\alpha + \beta = 1$ in Equation (2.5), we are left with

$$y_t = A\, k_t^{\alpha} \tag{2.6}$$

where $y_t$ represents output per capita, and $k_t$ represents physical capital stock per worker. Now, by taking the natural logarithm of both sides of Equation (2.6), we are left with

$$\ln(y_t) = \ln(A) + \alpha \ln(k_t) \tag{2.7}$$

where *A* represents the Solow residual or total factor productivity, which explains the unexplained part of the output. "*A*" can be any economic or non-economic variable, which explains the output. This paper develops the traditional approaches by introducing resource rents (RR), human capital (HC) as social development, and institutional quality (IQ) in the form of law and order and corruption in place of *A*.

The novelty of this study is that it adds resource rents (RR), law and order (LO), corruption (CRP), and human capital (HC) to Solow's original frameworks:

$$\ln(y_t) = \alpha \ln(k_t) + \theta_1 RR_t + \theta_2 LO_t + \theta_3 CRP_t + \theta_4 HC_t \tag{2.8}$$

As indicated earlier, much of the literature has argued that the resource curse means that resource rents will have a negative impact on countries that are relatively resource rich. This study tests the indirect impact of resource rents on growth via total factor productivity. Therefore, this study adopts the most widely accepted and commonly applied method to calculate the TFP, namely, the Cobb–Douglas production function (Cole and Neumayer, 2006; Miller and Upadhyay, 2000; Hall and Jones, 1999; Bernard and Jones, 1996). Thus, the total factor productivity from Equation (2.7) can be explained as follows.

$$\ln A = \ln\ y_t - \alpha ln(k_t) \tag{2.9}$$

$$lnA = tfp \tag{2.10}$$

The central determinants of TFP in this study are RR, LO, CRP, and HC. Thus,

$$tfp = f(RR, LO, Crp, HC) \tag{2.11}$$

or

$$tfp = \theta_1 RR_t + \theta_2 LO_t + \theta_3 Crp_t + \theta_4 HC_t \tag{2.12}$$

**2.3.2. Empirical Model and Estimation Procedure**

In this section, we present the dilemma of natural resource abundance empirically. We can write Equations (2.8) and (2.12) as follows:

$$ln(y_t) = \alpha_o + \alpha\, ln(k_t) + \theta_1 RR + \theta_2 LO + \theta_3 CRP + \theta_4 HC + \mu_t \tag{2.13}$$

and

$$tfp_t = \alpha_0 + \theta_1 RR_t + \theta_2 LO_t + \theta_3 Crp_t + \theta_4 HC_t + \mu_t \tag{2.14}$$

where $\alpha_o$ is the intercept, $\mu_t$ is the error term, and the subscript *t* is used to indicate that the data form a time series.

### 2.3.2.1 Autoregressive Distributed Lag Model

To derive the short-run and long-run results, this study applies the Autoregressive Distributed Lag Model (ARDL). The general form of the ARDL model of Equation (2.13) and (2.14) is as follows:

$$\begin{aligned}\Delta PGDP_t = \alpha_0 &+ \sum_{i=1}^{t} \delta_i \, \Delta PGDP_{t-i} + \sum_{i=1}^{t} \vartheta_i \, \Delta k_{t-i} + \sum_{i=1}^{t} \rho_i \Delta \, RR_{t-i} \\ &+ \sum_{i=1}^{t} \varphi_i \, \Delta LO_{t-i} + \sum_{i=1}^{t} \omega_i \Delta \, Crp_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta \, HC_{t-i} \\ &+ \lambda_1 PGDP_{t-1} + \lambda_2 k_{t-1} + \lambda_3 RR_{t-1} + \lambda_4 LO_{t-1} + \lambda_5 CRP_{t-1} + \lambda_6 HC_{t-1} \\ &+ \mu_t \end{aligned} \tag{2.15}$$

and

$$\begin{aligned}\Delta TFP_t = \alpha_0 &+ \sum_{i=1}^{t} \delta_i \, \Delta TFP_{t-i} + \sum_{i=1}^{t} \rho_i \Delta \, RR_{t-i} + \sum_{i=1}^{t} \varphi_i \, \Delta LO_{t-i} \\ &+ \sum_{i=1}^{t} \omega_i \Delta \, Crp_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta \, HC_{t-i} \\ &+ \lambda_1 TFP_{t-1} + \lambda_2 RR_{t-1} + \lambda_3 LO_{t-1} + \lambda_4 CRP_{t-1} + \lambda_5 HC_{t-1} + \mu_t \end{aligned} \tag{2.16}$$

where $\alpha_0$ is the drift component, $\mu_t$ is a residual term in period *t*, and the terms $\delta_i$, $\emptyset_i, \omega_i$, $\varphi_i$, $\rho_i$, and $\vartheta_i$ are the parameters used for short-run analysis, while $\lambda_1$, $\lambda_2$, $\lambda_3$, $\lambda_4$, $\lambda_5$, and $\lambda_6$ are used to estimate long-run parameters. The Wald restriction test is used to test the long-run relationships or co-integration between the dependent and the independent variables. The value of the F-test is determined by applying the coefficient diagnostic Wald restriction test on long-run variable parameters. The hypothesis for the co-integration test is

$H_0 = \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = 0$ (Absence of co-integration)

$H_1 = \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq \lambda_6 \neq 0$ (Presence of co-integration)

The F-test is based on the number of regressors in the model (Pesaran et al., 2001). The estimated F-statistic value is compared with the two sets of critical values of the lower and upper bounds. If the F-stat value is greater than the value of the upper bound, then the null hypothesis is rejected, which indicates that co-integration and a long-run relationship exist between the dependent and independent variables. If the value of the F-stat is lower than the value of the lower bound, then the null hypothesis is not rejected, which shows that there is no co-integration, meaning that no long-run association exists between the regressors. Finally, if the F-stat is between the lower bound and upper bound, then the result is inconclusive.

The appropriate lag length in the ARDL model was selected through the Akaike Information Criterion (AIC). The AIC is considered to be a useful model (Profillidis and Botzoris, 2018; Burnham and Anderson, 1998), so it was employed to determine the ideal lag length incorporated in the model. Co-integration and the error correction econometric method were employed for the estimation of the stated models. The co-integration analysis was performed within an Autoregressive Distributed Lag (ARDL) framework since it is a more statistically significant method that aims to identify the cointegrating relationships in a small sample. ARDL is a major dynamic model.

If the co-integration is statistically significant, then the values of the long-run parameters are found by normalizing the long-run Equation and estimating the error correction model for short-run analysis.

Under the assumption of the steady-state condition, the long-run Equations are $\Delta PGDP_i = 0$ and $\Delta TFp_i = 0$,

which means that

$$\Delta PGDP = PGDP_t - PGDP_{t-1} = 0 \Rightarrow PGDP_t = PGDP_{t-1}$$

$$\Delta TFP = TFP_t - TFP_{t-1} = 0 \Rightarrow TFP_t = TFP_{t-1}.$$

By applying the above assumption and dividing by $\lambda_1$, we can rewrite Equations (2.15) and (2.16) in the long-run form as follows:

$$\frac{\lambda_1}{\lambda_1} PGDP_t = \frac{\lambda_2}{\lambda_1} k_{t-1} + \frac{\lambda_3}{\lambda_1} RR_{t-1} + \frac{\lambda_4}{\lambda_1} LO_{t-1} + \frac{\lambda_5}{\lambda_1} CRP_{t-1} + \frac{\lambda_6}{\lambda_1} HC_{t-1} \tag{2.17}$$

and

$$\frac{\lambda_1}{\lambda_1} TFP_t = \frac{\lambda_2}{\lambda_1} RR_{t-1} + \frac{\lambda_3}{\lambda_1} LO_{t-1} + \frac{\lambda_4}{\lambda_1} CRP_{t-1} + \frac{\lambda_5}{\lambda_1} HC_{t-1}. \tag{2.18}$$

Now, by re-parameterizing,

$$PGDP_t = \psi_o + \psi_1 k_{t-1} + \psi_2 RR_{t-1} + \psi_3 LO_{t-1} + \psi_4 CRP_{t-1} + \psi_5 HC_{t-1} \tag{2.19}$$

and

$$TFP_t = \psi_o + \psi_1 RR_{t-1} + \psi_2 LO_{t-1} + \psi_3 CRP_{t-1} + \psi_4 HC_{t-1}. \tag{2.20}$$

Now, $\psi_1$, $\psi_2, \psi_3, \psi_4,$ and $\psi_5$ are the long-run parameters. Their values and signs determine the long-run relationships between the dependent variable and the independent variables in the model. For short-run analysis, the error correction model is used.

### 2.3.2.2 Error Correction Model

When a long-run relationship exists between variables, then there is an error correction representative model, so the following error correction model is estimated in the third step.

$$\Delta PGDP_t = \alpha_0 + \sum_{i=1}^{t} \delta_i \Delta PGDP_{t-i} + \sum_{i=1}^{t} \vartheta_i \Delta k_{t-i} + \sum_{i=1}^{t} \rho_i \Delta RR_{t-i} + \sum_{i=1}^{t} \varphi_i \Delta LO_{t-i} + \sum_{i=1}^{t} \omega_i \Delta Crp_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta HC_{t-i} + \gamma ECM_{t-1} \tag{2.21}$$

and

$$\Delta TFP_t = \alpha_0 + \sum_{i=1}^{t} \delta_i \Delta TFP_{t-i} + \sum_{i=1}^{t} \rho_i \Delta RR_{t-i} + \sum_{i=1}^{t} \varphi_i \Delta LO_{t-i} + \sum_{i=1}^{t} \omega_i \Delta Crp_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta HC_{t-i} + \gamma ECM_{t-1} \tag{2.22}$$

The coefficient of $ECM_{t-1}$ determines the speed of adjustment of the short-run shocks toward the long-run equilibrium in the case of any disturbance

#### 2.3.2.3 Description of the Data and Variables

Below is a diagram to clarify the Dependent (DV) and Independent Variables (IV) in the model of this study (Figure 2.1), where (IV3) is the variable of interest.

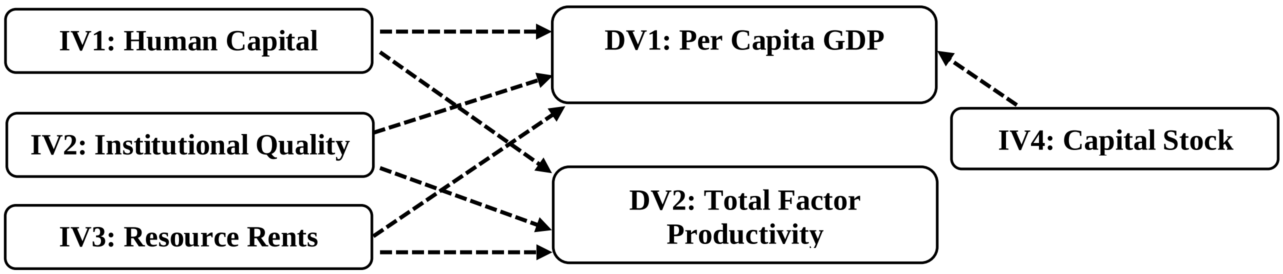



**Figure 2.1.** The dependent and independent variables.
Source: calculated by the author.

A description of the variables and the rationale for their inclusion in the model are presented below.

Per capita GDP (PGDP) (constant 2010 USD) is the dependent variable, as used in previous studies that considered PGDP as a proxy for the degree of development in a country (Kakanov et al., 2018; Olayungbo and Adediran, 2017; Akpan and Chuku, 2014; Busse and Groening, 2013; Arezki and Van der Ploeg, 2011; Kalyuzhnova et al., 2009). PGDP is measured by dividing the gross domestic product by the midyear population. Data on PGDP are from the World Development Indicators (WDI) provided by the World Bank (2017) for the period of 1984–2014, and the natural logarithm was taken for this variable. Figure (2.2a.) shows the PGDP in the three countries, with the UAE showing a higher PGDP for a long period of time, but KWT's PGDP exceeded UAE's PGDP between 2007 and 2013. Moreover, Figure (2.2b.) shows KSA with the highest GDP in comparison to KWT and UAE.

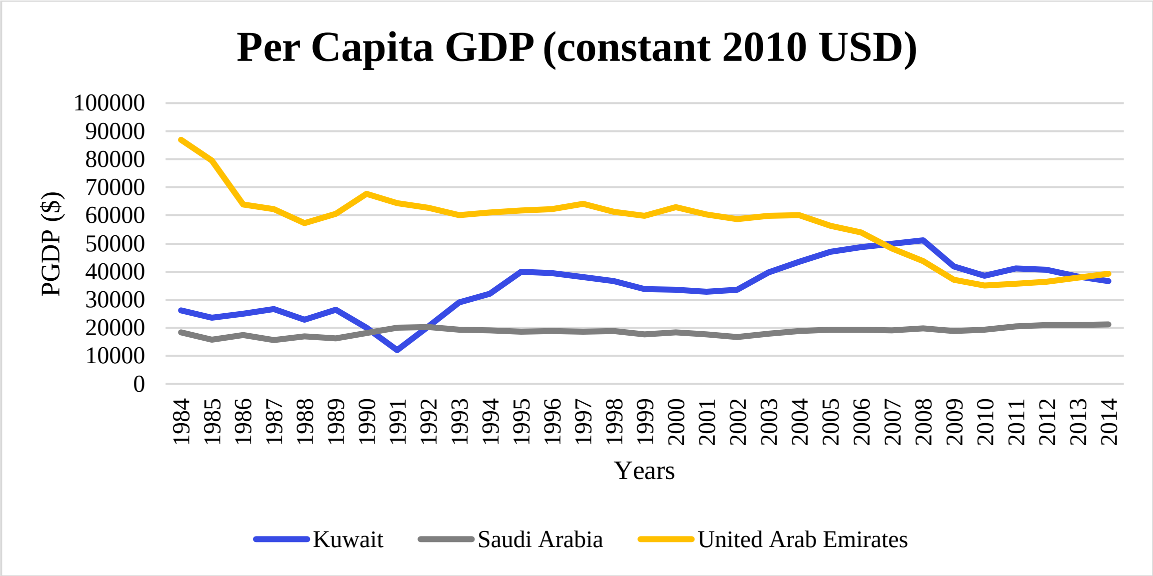



**Figure 2.2a.** Per Capita GDP (constant 2010 USD).
Source: Author, based upon data taken from the World Bank (2017).

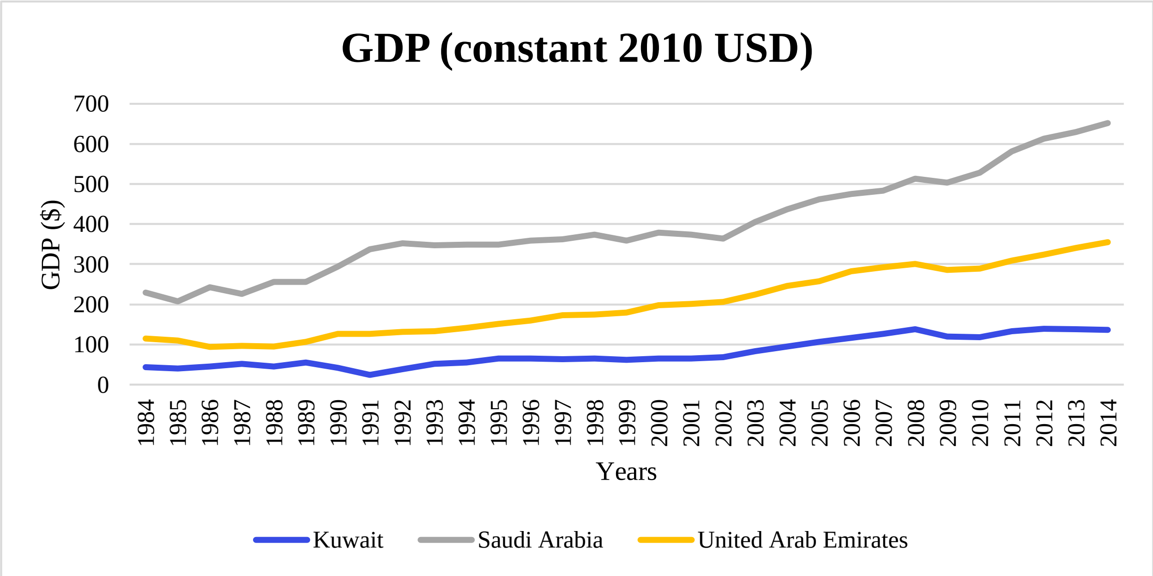



**Figure 2.2b.** GDP (constant 2010 USD).
Source: Author, based upon data taken from the World Bank (2017).

Real capital stock per worker is denoted by K. Capital stock includes infrastructure such as the ports and roads, buildings, machines, and vehicles that are used in the process of producing goods and services. It is required in this model because it is the model formation, so capital stock per worker is an independent variable in the model; however, the data were absent. Therefore, a base period capital stock was estimated by following a method called the perpetual inventory method (Berlemann and Wesselhoft, 2016) as follows:

$$K_0 = \frac{GFK_0}{\delta + g_{GFK}} \tag{2.35}$$

where $k_0$ is the capital stock, $GFK_0$ is the level of gross fixed capital formation, $g_{GFK}$ is average growth in gross fixed capital formation for 1984–2014, and δ is the rate of depreciation, which is assumed to be 5% per year because it is the standard percentage (Berlemann and Wesselhoft, 2016; Cole and Neumayer, 2006). To calculate the data for the targeted years, we used the procedure given by the following Equation.

$$K_t = K_{t-1} - \delta K_{t-1} + GFK_t = (1 - \delta)K_{t-1} + GFK_t \tag{2.36}$$

where $k_t$ is a capital stock in the current year, $k_{t-1}$ is the capital stock in the previous year, $GFK_t$ is the gross fixed capital formation, and δ is the rate of depreciation, as indicated above. The data on gross fixed capital formation (constant 2010 USD) are from the World Bank (2017) and presented in Figure (2.3).

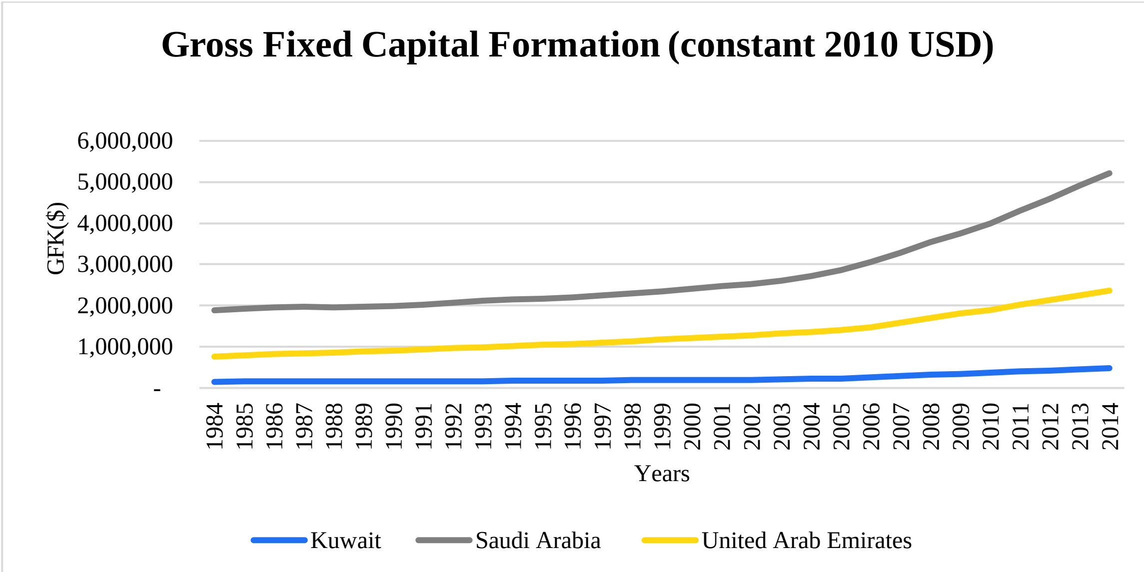



**Figure 2.3.** Gross Fixed Capital Formation (constant 2010 USD).
Source: Author, based upon data taken from the World Bank (2017).

Total Factor Productivity (TFP) is a dependent variable in the second empirical model of this study. TFP is the portion of output that is not explained by the volume of inputs used in production (Comin, 2017). The source of TFP data for KWT and KSA is the Penn World Tables v9.0 (Feenstra et al., 2015), which provide the TFP data for 182 countries. However, TFP data for the UAE were not available, so TFP was calculated by using the Cobb–Douglas production function, and the results are given in Appendix B., Table (B2). Figure (2.4) presents the productivity in the three countries from 1984 to 2014. the UAE shows the highest TFP, while KWT and KSA are somewhat similar.

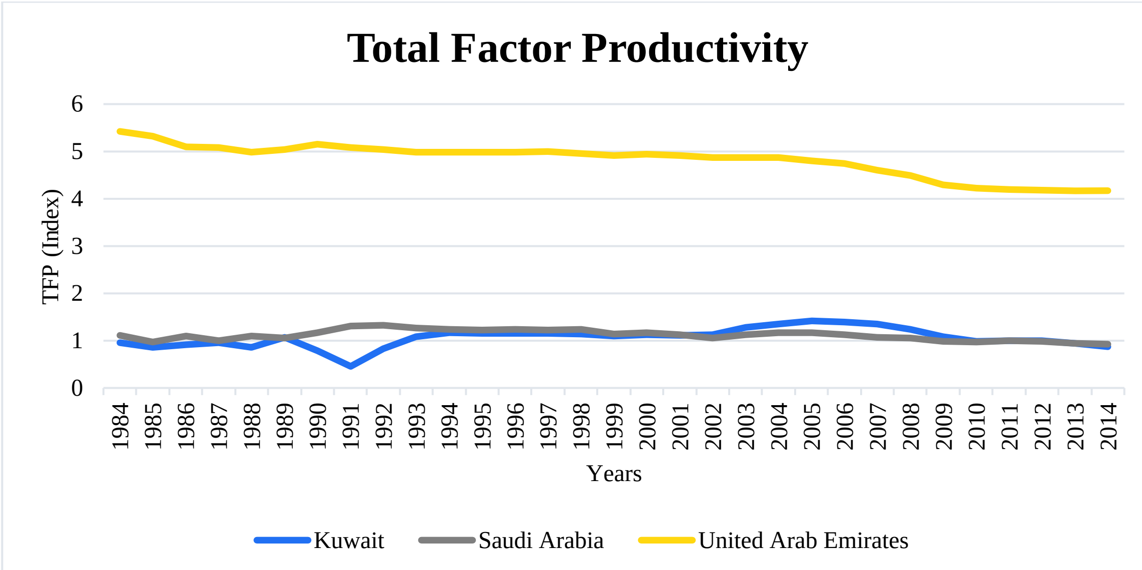



**Figure 2.4.** Total Factor Productivity.
Source: Author, based upon data taken from the Penn World Table (Feenstra et al., 2015)).

The labor force is the number of persons employed in a country. The labor force is a major factor of production. It was used in the model to estimate the production function, along with capital stock, to get the TFP. The data is from the Penn World Table (PWT) (Feenstra et al., 2015).

Human capital (HC) is viewed as the accumulation of education (Sun et al., 2018). Human capital theory explains that education is a significant source of human capital, which, in time, is an important component of the economic growth of any country (Acevedo, 2008). Earlier studies have highlighted that economic growth and productivity are noticeably influenced by educational attainment (Gennaioli et al., 2013; Ciccone and Papaioannou, 2009) and that a well-educated workforce increases TFP and thus economic growth (Nachega and Fontaine, 2006). Thus, this study included the human capital index, following Kim and Lin (2017), to test the impact of human capital (Figure 2.5) on TFP and PGDP. The data source is the Penn World Table (PRS group) (Feenstra et al., 2015), in which it is referred to as the human capital index. PWT v9.0 introduced the human capital index based on the average years of schooling (Barro and Lee, 2013) and weighted by the respective return on schooling in each year (Psacharopoulos, 1994). The human capital index is highest in the UAE and the lowest in KWT (Figure 2.5).

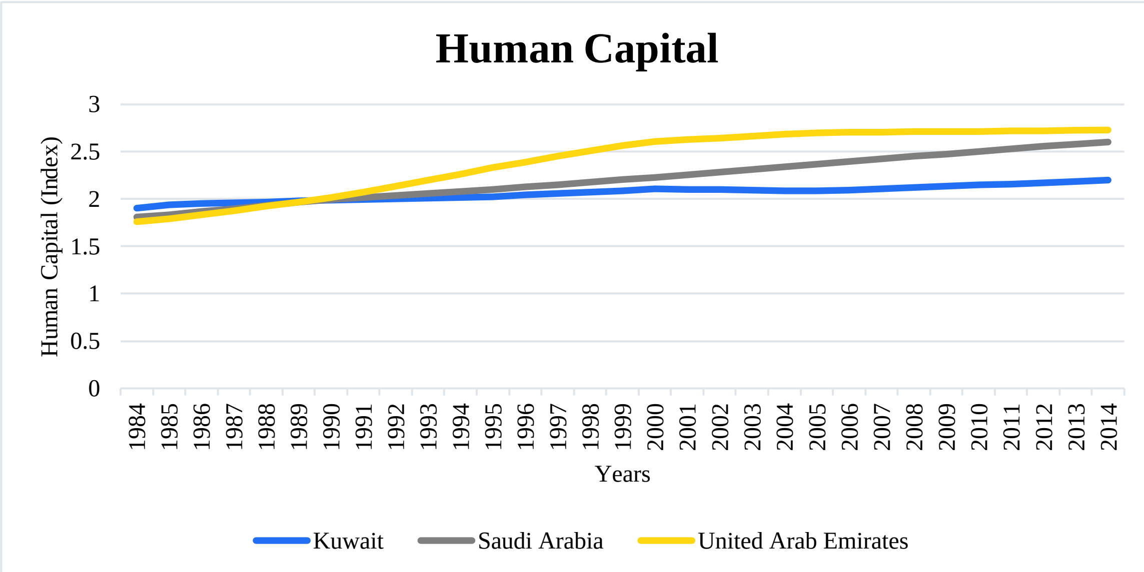



**Figure 2.5.** Human Capital Index.
Source: Author, based upon data taken from the Penn World Table (Feenstra et al., 2015).

Institutional Quality (IQ) is included using Corruption (CRP) and Law and Order (LO) as a proxy of IQ (Herzfeld and Weiss, 2003). Corruption was defined by Aidt (2003) as the use of public power for individual interest, so it negatively affects the economy (Aidt et al., 2008; Lambsdorff, 2007; Meon and Sekkat, 2005; Mo, 2001). Corruption in the political system is defined by the International Country Risk Guide (ICRG) as “a threat to foreign investment by distorting the economic and financial environment, reducing the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability, and introducing inherent instability into the political process” (ICRG, 2017). High scores indicate that “high government officials are likely to demand special payments” and “illegal payments are generally expected throughout lower levels of government” in the form of “bribes connected with import and export licenses, exchange controls, tax assessment, policy protection, or loans” (Knack and Keefer 1995). Corruption is presented in the ICRG as the “control of corruption”, which is measured using a scale from 0 to 6. The measure of corruption is inverted to “corruption” in this paper (Figure 2.6a), which is a similar approach to that used by Okada and Samreth (2017).

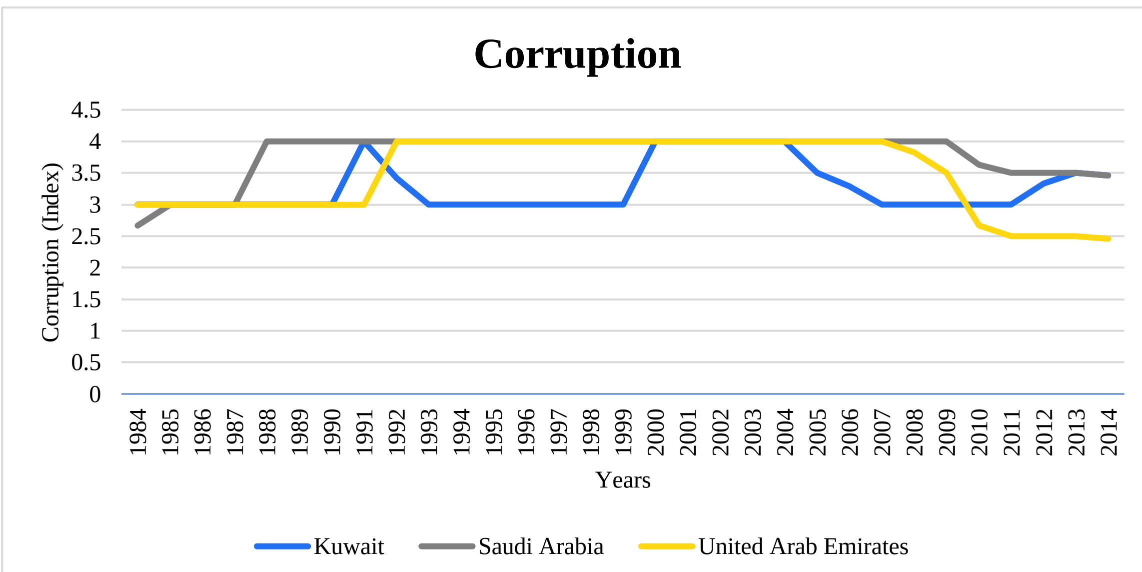



**Figure 2.6a.** Corruption Index.
Source: Author, based upon data taken from the ICRG (2017).

As stated in Knack and Keefer (1995), LO reflects “the degree to which the citizens of a country are willing to accept the established institutions to make and implement laws and adjudicate disputes”. The data were obtained from the ICRG by the PRS Group for the period between 1984 and 2014. This is a similar approach used by a range of studies, such as those by Busse and Groening (2013), Tebaldi and Elmslie (2013), and Knack and Keefer (1995).

Further, “law and order” is measured on a scale of 0–6. The ICRG explained that LO (Figure 2.6b) is two measures that constitute one risk component. Each subcomponent equals half of the total (thus, a scale of 0–3 is used for each). The "law" subcomponent reflects the impartiality and the strength of the legal system, while the "order" assesses the popular observance of the law (ICRG, 2017). Higher scores indicate “sound political institutions, a strong court system, and provisions for an orderly succession of power.” Lower scores indicate “a tradition of depending on physical force or illegal means to settle claims” (Knack and Keefer 1995). Good institutional quality enhances productivity, economic growth, and development in the country (Olayungbo and Adediran, 2017; Haapanen and Tapio, 2016; Perera and Lee, 2013; Acemoglu and Robinson, 2010).

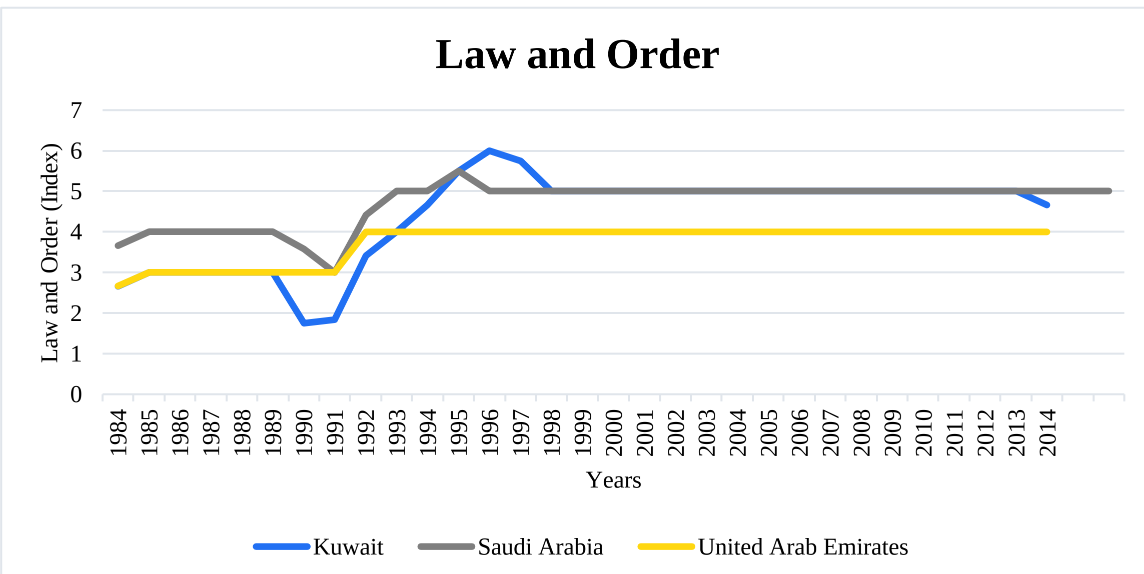



**Figure 2.6b.** Law and Order.
Source: Author, based upon data taken from the ICRG (2017).

The Resource Rents (RR) variable is defined as the sum of oil, natural gas, coal, mineral, and forest rents (World Bank, 2017). It was used as an independent variable in this study to evaluate the impact of nonrenewable natural resources on PGDP and TFP. RR is the value of interest and the natural logarithm was taken for this variable. The total natural resource rents (% of GDP) data were taken from the World Development Indicators (WDI) provided by the World Bank (Figure 2.7) following the approach used by Okada and Samreth (2017), Elbadawi and Soto (2015), Farhadi et al. (2015), Bhattacharyya and Hodler (2014), and Anthonsen et al. (2012). Hereinafter, resource rents refer to the resource rents as a proportion of GDP.

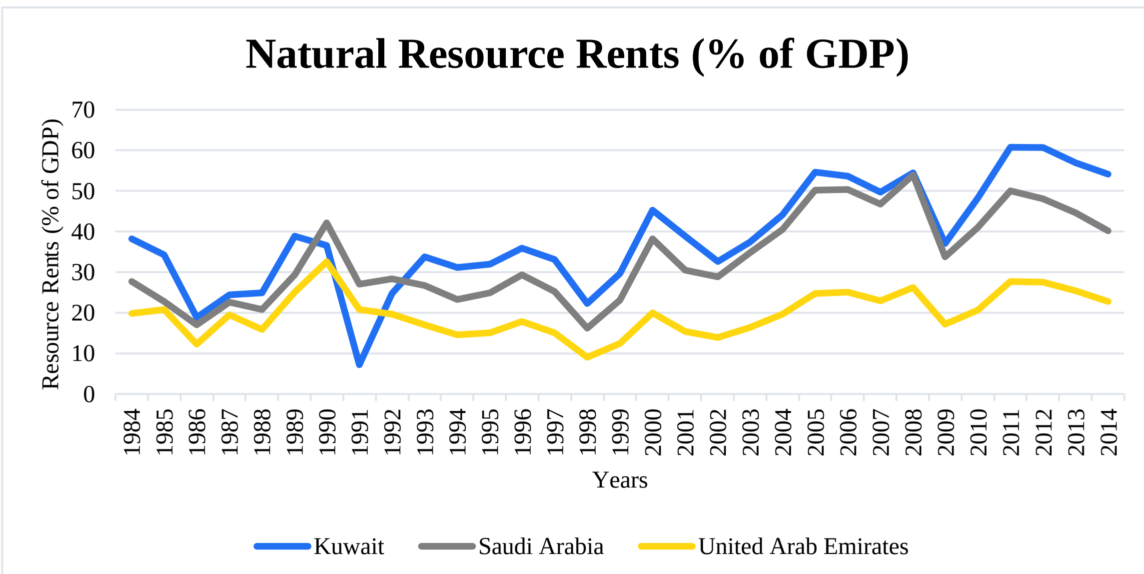



**Figure 2.7.** Natural Resource Rents (% of GDP).
Source: Author, based upon data taken from World Bank (2017).

The descriptive analysis of the variables under study is given in Appendix B., Table (B1).

## 2.4 Results and Discussion

### 2.4.1 Unit Root Test

Checking the order of integration of variables is a precondition for any co-integration technique. For this purpose, the augmented Dickey–Fuller (ADF) and Phillips–Perron (Appendix B., Table B3) unit root tests were applied. The probability values are given in parentheses, and the results of (ADF) unit root test are reported in Table (2.1). In the case of KWT, the results from both tests are consistent, except for the variable LO. For PGDP, HC, TFP, and CRP, the null hypotheses of a unit root could not be rejected at the 5% level of significance. All these variables are integrated of order one, I(1). The other variables under consideration, such as RR, are stationary at levels, I(0). For LO, the reported results of augmented Dickey–Fuller indicate the rejection of the null hypothesis at level, while results of Phillips–Perron indicate non-stationarity at level, while the series is stationary with first difference transformation.

For KSA, the null hypotheses of a unit root at level could not be rejected at the 10% level of significance for PGDP, TFP, HC, CRP, and LO, but these variables are stationary at first difference. However, RR and K are stationary at level. For the UAE, the null hypotheses of a unit root at level could not be rejected at the 10% level of significance for PGDP, HC, TFP, LO, CRP, and K, but these variables are stationary at first difference. However, the variable RR was shown to be stationary at level.

**Table 2.1 Results of the Augmented Dickey–Fuller Unit Root Test**

| Variable \ Country | Kuwait | | The Kingdom of Saudi Arabia | | The United Arab Emirates | |
|---|---|---|---|---|---|---|
| | **Level** | **1st Difference** | **Level** | **1st Difference** | **Level** | **1st Difference** |
| **Per capita GDP** | –2.131 (0.234) | –4.714*** (0.000) | –1.866 (0.342) | –8.618*** (0.000) | –1.684 (0.428) | –3.845*** (0.006) |
| **Human Capital** | –2.418 (0.145) | –3.027** (0.045) | 0.833 (0.993) | –4.037** (0.004) | –0.318 (0.910) | –3.546** (0.013) |
| **Resource Rents** | –3.223** (0.028) | | –3.577** (0.049) | | –2.888** (0.058) | |
| **TFP** | –2.256 (0.191) | –4.786*** (0.000) | –1.247 (0.640) | –7.219*** (0.000) | –2.150 (0.227) | –4.052*** (0.004) |
| **Law and Order** | –5.990*** 0.000) | | –1.656 (0.440) | –3.721*** (0.000) | –2.392 (0.152) | –5.661*** (0.000) |
| **Corruption** | –2.352 (0.163) | –5.430*** (0.000) | –2.581 (0.290) | –5.257*** (0.000) | –0.631 (0.290) | –4.025*** (0.004) |
| **Capital Stock** | –3.451 (0.016**) | | –2.955 (0.050**) | | –0.465 (0.979) | –3.254* (0.093) |

The values in the parentheses represent the P-value. * is 10% significance, ** is 5% significance; and *** is 1% significance.

### 2.4.2 The ARDL and Bound Test

Table (2.1) reports two very important features regarding the univariate characteristics of variables used in this study. First, all variables follow different orders of integration: I(1) and I(0). Second, all proposed dependent variables are integrated of order one (stationary at level). These two characteristics of variables allowed for the application of ARDL because they are also important prerequisites. The other prerequisite for ARDL is the existence of co-integration between I(0) and I(1) variables. This is done by a co-integration bound test (Pesaran et al., 2001), and the bound testing procedure is based on the Wald test (F-test). Two critical values are given by Pesaran et al. (2001) for the co-integration test. The lower critical bound assumes that all the variables are I(0), which means that there is no co-integration relationship between the examined variables. The upper bound assumes that all the variables are I(1), which means that there is co-integration among the variables. If the computed F-statistic is greater than the upper bound critical value, then the null hypothesis that the variables are co-integrated is rejected. If the F-statistic is below the lower bound critical value, then the null hypothesis cannot be rejected.

The bound test results for KWT in Table (2.2) show that the values of the F-statistics are higher than the upper bound at the 95% confidence interval. The values are (4.43) for PGDP and (5.37) for TFP. With these results, it can be assumed that, for all equations, there is at least one short- or long-run cointegrating relationship between I(0) and I(1) variables. All preconditions to apply ARDL are fulfilled for KWT. In the table, K is the degree of freedom, and it shows the independent variables in the selected model.

The results for KSA are given in Table (2.2), which shows that all values of the F-statistics are higher than the 95% confidence interval. The values are (7.22) for PGDP and (4.73) for TFP, which prove the existence of a long- and short-run co-integration. Hence, all prerequisites for applying ARDL are met for KSA.

For the UAE, the values are (18.48) for PGDP and (4.23) for TFP. Hence, these results in the UAE confirm a long and short-run co-integration. All prerequisites for applying ARDL are now met, so we can proceed to the next step for obtaining regression results.

**Table 2.2 Co-integration Bound Test Results.**

| Country | Kuwait | | The Kingdom of Saudi Arabia | | The United Arab Emirates | |
|---|---|---|---|---|---|---|
| Dependent Variable | F- Statistics | K | F- Statistics | K | F- Statistics | K |
| **PGDP** | 4.43 | 5 | 7.22 | 5 | 18.48 | 5 |
| **TFP** | 5.37 | 4 | 4.73 | 5 | 4.23 | 4 |

### 2.4.3 Short-Run and Long-Run Results of the Impacts of Natural Resources on Per Capita GDP in Kuwait, the Kingdom of Saudi Arabia, and the United Arab Emirates

The first regression equation (2.15) captures the impact of resource rents (RR) on per capita GDP (PGDP) while controlling for corruption (CRP), law and order (LO), human capital (HC), and capital stock (K). The appropriate lag length of ARDL was selected using the Akaike Information Criteria (Table 2.3).

The upper part of Table (2.3) shows the short-run estimates from the error correction model, while the bottom part presents the long-run estimates. The error correction term highlights the short-run dynamics of the model. In KWT, the error correction term is negative with a value of 0.71, which means that 71% of the error is corrected every year successively. The negative sign represents the stability of the model. The simultaneous significance of long-run and short-run estimates indicates the strong and persistent causal relationship between variables. In the KSA model, the error correction term is significant at 1% with a negative value of 0.91, meaning that 91% of the error is corrected every year successively and that the model is stable. Moreover, in the UAE model, the error correction term is significant at the 1% level with a negative value of 0.48, meaning that 48% of the error is corrected every year successively and that the model is stable.

**Table 2.3 Impact of Resources Rents, Institutional Quality, and Human Capital on Per Capita GDP.**

| Short-run results | | | | | | |
|---|---|---|---|---|---|---|
| **Country** | **Kuwait** | | **The Kingdom of Saudi Arabia** | | **The United Arab Emirates** | |
| **Variable** | **Coefficient** | **t-Statistics** | **Coefficient** | **t–Statistics** | **Coefficient** | **t–Statistics** |
| **Resource Rents** | 0.218*** | 4.309 | 0.024 | 0.715 | 0.177*** | 7.222 |
| **Resource Rents (–1)** | 0.009 | 1.230 | –0.083* | –1.920 | –0.042* | –1.768 |
| **Resource Rents (–2)** | 0.038 | 0.925 | | | | |
| **Corruption** | –0.006 | –0.152 | –0.281** | –2.140 | 0.002 | 0.091 |
| **Corruption (–1)** | 0.057 | 1.059 | | | | |
| **Law and Order** | 0.212*** | 7.650 | –0.028 | –1.169 | –0.001 | –0.040 |
| **Law and Order (–1)** | | | | | –0.082** | –2.757 |
| **Human Capital** | 0.738*** | 6.611 | –0.262*** | –3.829 | 0.369*** | 4.803 |
| **Human Capital (–1)** | 0.101** | 2.348 | –0.335*** | –3.223 | | |
| **Capital Stock** | 0.116* | 1.796 | 1.456** | 2.891 | 0.638*** | 9.986 |
| **CointEq (–1)** | –0.711*** | –6.280 | –0.918*** | –5.371 | –0.488*** | –4.553 |
| **Long–run results** | | | | | | |
| **Variable** | **Coefficient** | **t-Statistics** | **Coefficient** | **t–Statistics** | **Coefficient** | **t–Statistics** |
| **Resource Rents** | 0.098 | 0.056 | 0.179*** | 3.107 | 0.486*** | 3.588 |
| **Corruption** | –0.100** | –2.521 | –0.126 | –0.794 | 0.005 | 0.089 |
| **Law and Order** | 0.181*** | 11.048 | –0.030 | –1.094 | 0.225* | 1.715 |
| **Human Capital** | 0.630*** | 4.632 | 0.083*** | 3.127 | 0.756*** | 4.423 |
| **Capital Stock** | 0.058 | 0.925 | 0.016 | 0.069 | 1.306 | 0.069 |
| **C** | 10.847*** | 19.676 | 9.402*** | 26.378 | 7.284*** | 6.262 |

Note: ***, **, and * denote the significance at the 99%, 95%, and 90% confidence interval respectively.

#### 2.4.3.1 Results in Kuwait

Resource rents have a short-run positive effect on PGDP of 0.2% per 1% increase in the proportion of resource rents in KWT GDP. This is significant at the 1% level, while all lags for resource rents are statistically insignificant. This result suggests that resource rents have a one-time effect on PGDP.

Institutional quality measured as corruption reduces PGDP by 0.10% in the long-run per 1% increase in corruption, while short-run estimates for both level and first lag are not statistically significant for PGDP. Results show that the law and order situation and human capital measured as education are useful predictors of PGDP in both the long and short-run. Improvement in law and order, as the other measure of institutional quality, increases PGDP by 0.21% and 0.18% in the short and long-run, respectively, relative to a 1% increase in law and order. The effect of human capital is even more pronounced: a 1% increase in human capital increases the PGDP significantly by 0.73% in the short-run and 0.63% in the long-run. Additionally, a 1% increase in the one-year lag of human capital has a positive effect on PGDP by 0.1%. Capital stock is marginally significant in the short-run, but long-run estimates of capital stock for PGDP are insignificant. A perspective of the data and results is presented in Appendix C. (Figure C1, Section 1.1).

Further, to evaluate the stability of the model, the cumulative sum control chart (CUSUM) and CUSUM of squares tests were applied, and the results of both tests indicate that model is stable (Appendix D., Figures D1 and D2).

### 2.4.3.2 Results in the Kingdom of Saudi Arabia

The short-run results show that current resource rents (% of GDP) have no effect on PGDP, but the first lag is statistically significant for PGDP, with a negative effect of 0.08% per 1% increase in the one-year lag of resource rents. However, in the long-run, a 1% increase in resource rents (as a proportion of GDP) increases PGDP by 0.17%. Corruption and law and order show different effects in KSA. A 1% increase in corruption reduces PGDP by 0.28% in the short-run, and the effect of law and order is statistically insignificant in both periods. A 1% increase in the one-year lag of human capital shows a negative relationship with PGDP by 0.33%. Moreover, a 1% increase in human capital has a negative effect on PGDP by 0.26% in the short-run and a positive effect in the long-run by 0.08%. Lastly, capital stock has a significant positive effect in the short-run on PGDP by 1.45% following a 1% increase in capital stock, but long-run estimates are insignificant. Additional analysis of the data and results in KSA is presented in Appendix C. (Figure C2, Section 1.2).

Further, the CUSUM and CUSUM of Squares tests were applied to confirm the stability of the model and the relationship between the dependent and the independent variables (Appendix D., Figures D3 and D4).

### 2.4.3.3 Results in the United Arab Emirates

In the UAE, natural resource rents (% of GDP) have a positive impact on PGDP both in the short and long-run by 0.17% and 0.48%, respectively, per 1% increase in the proportion of resource rents in the UAE’s GDP. However, a 1% increase in the one-year lag form of resource rents (as a proportion of GDP) shows a negative impact on PGDP by 0.04%. Then, a 1% increase in the one-year lag form of law and order in the short-run shows a negative impact on PGDP by 0.082% at the 95% confidence interval. Nevertheless, law and order, in the long-run, show a positive impact on PGDP at the 90% confidence interval, so a 1% increase in law and order increases PGDP by 0.22%. The impact of human capital in the form of education on PGDP is positive by 0.36% and 0.75% in both the short and long-run following a 1% increase in human capital at the 99% confidence interval. Similarly, the model is 99% confident that capital stock has a positive effect on PGDP by 0.63% in the short-run per 1% increase in capital stock. Further assessment of the results of the UAE during the period under study is given in Appendix C. (Figure C3, Section 1.3).

Additionally, the CUSUM and CUSUM of squares tests were applied to this model to prove the stability of the model and the association between the dependent and the independent variables (Appendix D., Figures D5 and D6).

### 2.4.4 Overall Discussion

The results differ for each country, and this variation reflects the fact that every country has its own experiences, settings, and features that can change its economy's response to changes in an independent variable. The aim of the following section is to discuss the results of the impact of natural resources, institutional quality, and human capital on PGDP in the three countries and link these results to the literature to derive explanations for every significant situation.

#### 2.4.4.1. Natural Resource Rents

The positive relationship between natural resource rents (% of GDP) and PGDP in KWT and the UAE in the short-run is an indication that natural resource wealth contributes significantly to the standard of living, as well as the development, in KWT and the UAE since PGDP is seen as a proxy for development (Olayungbo and Adediran, 2017; Akpan and Chuku, 2014). The results for these countries could possibly be the result of their governments' distributing these revenues to their citizens in the form of pensions, cash payments, high wages, and a reduction in costs for households and local businesses through government subsidies, such as subsidized fuel and subsidized water prices and electricity, as discussed by Hvidt (2013). These results contradict the resource curse theory (Arezki and Van der Ploeg, 2011; Sala-i-Martin et al., 2004) but confirm the results of Smith (2015) and Alexeev and Conrad (2009).

However, the findings of the negative impact of the one-year lag of resource rents (% of GDP) on PGDP in KSA and the UAE support the resource curse theory (Sala-i-Martin et al., 2004; Sala-i-Martin, 1997), which means that resource rents can lead to high public consumption and can reduce the incentives for investment projects (Ben-salha et al., 2018; Baland and Francois, 2000). Moreover, the world prices of natural resources are highly volatile, which triggers extreme PGDP volatility (Poelhekke and Van der Ploeg, 2009), and a country's volatile revenues impose welfare loss for risk-averse investors (Loayza et al., 2007). Conversely, the long-run results show a positive impact of resource rents (% of GDP) on PGDP in KSA and the UAE. These results align with Mehar et al. (2018) and Alexeev and Conrad (2009) and contradict the resource curse hypothesis.

#### 2.4.4.2 Institutional Quality

Corruption appears to have a negative impact on PGDP in the short-run in KSA and in the long-run in KWT, but no results are significant in the UAE. The causes of the negative relationship have been explained at length in the literature (Gyimah-Brempong, 2002). This finding is consistent with many studies that have confirmed a strong statistically significant negative impact of corruption on PGDP (Hassaballa, 2017; Mustapha, 2014; Ugur, 2014; Aidt, 2009; Kalyuzhnova et al., 2009; Gyimah-Brempong, 2002; Mauro, 1997; 1995).

Law and order's positive effect on PGDP in this model—in the short-run in KWT and in the long-run in the UAE and KWT—has been highlighted by many studies that have concluded that good institutions improve PGDP (Butkiewicz and Yanikkaya, 2006; Dollar and Kraay, 2001; Knack and Keefer, 1995). The reason has been clarified by different studies: when a country adheres to law and order—which is demonstrated by the maintenance of property rights, a stronger court system, and absence of corruption—people start to understand and respect the legal system and follow the rules, resulting in higher PGDP (Sala-i-Martin, 1997; Knack and Keefer, 1995; Mauro, 1995). These results agree with the findings of Butkiewicz and Yanikkaya (2006) and Dollar and Kraay (2001). Nevertheless, the insignificant impact of law and order on PGDP in KSA and the negative effect of the one-year lag of law and order on PGDP in the UAE contradict the common rule of a positive impact (Nawaz et al., 2014; Faruq and Taylor, 2011). One possibility can be inferred from the figures above (Figures 2.6a and 2.6b), namely, that institutional quality in both countries started at high levels, which explicitly show that there is less room for improvement; hence, no impact on PGDP is found for the short-run in the UAE and KSA and for the long-run in KSA. Another apparent reason is related to the findings of Acemoglu and Robinson (2010), who reported that institutions vary among societies because of their different economic institutions (security of property rights), different formal systems of collective decision making (dictatorship versus democracy), and different levels of development (Nawaz et al., 2014).

Accordingly, institutions are expected to function differently, so institutions that perform well in one country may not be suitable in a different country.

For instance, institutions in KWT are highly influenced by politics, although KWT is considered to be the more democratic country compared with the other GCs. The economy in KWT has benefited from the openness to foreign investment, but there are sectors that are not open to foreign investment, which, along with poorly developed legal systems, creates obstacles to foreign investors (The Heritage Foundation, 2019). Although the UAE is considered to be a liberal country in the Gulf region, its liberal side is stained by institutions that are dependent on and heavily influenced by the political leadership. Nonetheless, the UAE is upholding the rule of law, and it is one of the least corrupt countries in the region. Finally, KSA is an absolute monarchy that upholds the Shari‘ah law. Institutions are under the guidance of the executive branch, which is known to be slow and sometimes nontransparent, and the monarchy is considered to be above the law (The Heritage Foundation, 2019).

**2.4.4.3 Human Capital**

The importance of human capital to growth and productivity reported in the literature is confirmed by the results of our model. Starting with the short-run, human capital shows a positive impact on PGDP in KWT and the UAE, and the one-year lag of human capital is positive in KWT as well, indicating that the knowledge and skills acquired through education are essential for enhancing human capital and good standards of living, thus promoting PGDP (Delalibera and Ferreira, 2019; Appiah, 2017; Ali and Jabeen, 2015; Hanushek and Woessmann, 2010; Aghion et al., 2009; Ozturk, 2001). When it comes to the long-run, human capital is more important, as revealed by the results for KWT, KSA, and the UAE. One possible reason that drives the positive relationship between human capital and PGDP is that knowledge and skills attained through education are conducive to the improvement in workers' productivity and facilitate the absorption of superior technologies from other leading countries, which is essential for enhancing human capital and ensuring good standards of living, thus promoting PGDP (Ali and Jabeen, 2015; Hanushek and Woessmann, 2010; Aghion et al., 2009; Ozturk, 2001). Our findings agree with the findings of several studies, such as those by Delalibera and Ferreira (2019), Appiah, (2017), Faruq and Taylor, (2011), Keller (2006), Bauer et al. (2006), Bensi et al. (2004), Petrakis and Stamatakis (2002), and Krueger and Lindahl (2001). However, the results are different in KSA, which is revealed to experience the negative effects of human capital and the one-year lag of human capital on PGDP in the short-run. One possibility is that human capital accumulation is taking time, i.e., it grows cumulatively over a long period (Cervellati and Sunde, 2002; Garavan et al., 2001); thus, no benefits are documented in the short-run, while disadvantages are apparent. The negative effect becomes positive in the long-run because the education attained by the populace is advantageous to the economy (Appiah, 2017) and productivity (Kampelmann et al., 2018).

#### 2.4.4.4 Capital Stock

Finally, capital stock shows an important short-run effect in all three countries. Moreover, the same positive impact is found in the long-run only for the UAE. The possible reasons for the positive relationship are related to the fact that capital stock improves investments, production, and employment, as well as raises the purchasing power and national income and hence PGDP. This finding has been proved in previous studies (Nawaz and Alvi, 2017; Cole and Neumayer, 2006; King and Levine, 1994).

### 2.4.5 Short-Run and Long-Run Results of the Impacts of Natural Resources on Productivity in Kuwait, the Kingdom of Saudi Arabia, and the United Arab Emirates

Table (2.4) shows the impact of resource rents (RR) on total factor productivity (TFP) while controlling for human capital (HC), law and order (LO), and corruption (CRP). The orders of lag lengths in the ARDL were selected using the Akaike Information Criteria (AIC). The error correction term is negative and significant, indicating the stability of the three models. The rate at which the variables readjust to equilibrium once they deviate from equilibrium in the face of any shock is 65% in KWT, 48% in KSA, and 58% in the UAE.

| **Table 2.4 Impact of Resources Rents, Institutional Quality, and Human Capital on Total Factor Productivity** | | | | | | |
|---|---|---|---|---|---|---|
| **Short-run results** | | | | | | |
| **Country** | **Kuwait** | | **The Kingdom of Saudi Arabia** | | **The United Arab Emirates** | |
| **Variable** | **Coefficient** | **t-Statistics** | **Coefficient** | **t-Statistics** | **Coefficient** | **t-Statistics** |
| **TFP (-1)** | | | | | 0.462*** | 4.083 |
| **Resource Rents** | 0.102* | 1.812 | 0.010 | 0.338 | 0.129*** | 4.424 |
| **Resource Rents (-1)** | 0.046 | 0.978 | –0.013 | –0.264 | | |
| **Resource Rents (-2)** | | | –0.136*** | –3.239 | | |
| **Corruption** | –0.069 | –1.306 | –0.410*** | –4.015 | –0.086*** | –2.868 |
| **Corruption (-1)** | 0.075 | 1.156 | | | | |
| **Law and Order** | 0.048** | 2.730 | –0.062* | –2.115 | –0.051 | –1.157 |
| **Law and Order(-1)** | | | –0.042 | –1.593 | | |
| **Law and Order(-2)** | | | –0.044* | –1.916 | | |
| **Human Capital** | 0.367* | 1.846 | –0.128* | –1.935 | 0.109* | 1.739 |
| **Human Capital (-1)** | 0.138** | 2.341 | –0.081 | –0.732 | | |
| **Human Capital (-2)** | | | –0.284** | –2.643 | | |
| **CointEq (-1)** | –0.646*** | –3.353 | –0.486*** | –3.023 | –0.583*** | –3.853 |
| **Long-run results** | | | | | | |
| **Variable** | **Coefficient** | **t–Statistics** | **Coefficient** | **t–Statistics** | **Coefficient** | **t–Statistics** |
| **Resource Rents** | –0.327** | 2.074 | 0.413** | 3.034 | 0.042 | 0.849 |
| **Corruption** | –0.244*** | –3.043 | –0.844*** | –2.948 | –0.148*** | –5.899 |
| **Law and Order** | 0.075** | 2.173 | 0.042 | 0.789 | –0.088 | –1.409 |
| **Human Capital** | 0.568** | 2.663 | 0.356*** | 4.308 | 0.187** | 2.347 |
| **C** | 0.075 | 0.078 | –1.063 | –1.710 | 0.208 | 1.220 |

Note: ***, **, and * denote the significance at the 99%, 95%, and 90% confidence interval respectively.

### 2.4.5.1 Results in Kuwait

Similar to the PGDP results for KWT, in the short-run, a 1% increase in the percentage of resource rents of KWT GDP increases TFP significantly by 0.10% (at the 5% level of significance). However, in the long-run, a 1% increase in resource rents (as a proportion of GDP) reduces TFP by 0.33% at the 5% level of significance.

Corruption has no statistically significant effect on TFP in the short-run. However, in the long-run, a 1% increase in corruption reduces TFP by 0.24%. Law and order increase TFP by 0.04% in the short-run and 0.07% in the long-run. It is observed that human capital in both its level and lag form is positively significant, and its long-run effect is remarkably high: with a 1% increase in human capital, TFP increases by 0.36%, 0.13%, and 0.56%, respectively. Further assessment of the data and findings is provided in Appendix C. (Figure C4, Section 2.1).

For the purpose of checking the stability of the model, the CUSUM and CUSUM of squares tests were applied, and the results of both tests indicate that the model is stable (Appendix D., Figures D7 and D8).

#### 2.4.5.2 Results in the Kingdom of Saudi Arabia

The results are notable for the relationship between resource rents (% of GDP) and TFP. The current and the past resource rents show no impact on TFP in KSA, but the negative effect of resource rents on TFP is noticeable after two years (two-year lag of resource rents), so a 1% increase in the percentage of resource rents in KSA GDP decreases TFP by 0.13%. Nevertheless, in the long-run, as resource rents increase (as a proportion of GDP) by 1%, TFP increases by 0.4%.

The results reveal that corruption affects TFP negatively in the short-run by 0.41% and in the long-run by 0.8% following a 1% increase in corruption. Moreover, in the short-run, the law and order variable negatively affects TFP in the current and two-year lag form by 0.06% and 0.04%, respectively, per 1% increase in law and order, while it is insignificant in the long-run. In addition, human capital in its level and two-year lag form is significant, but it has a negative effect on TFP in the short-run. However, a 1% increase in human capital improves

TFP by 0.35% in the long-run. Figure (C5) shows the data for the period under study to help the assessment of the results (Appendix C., Section 2.2).

Then, the CUSUM and CUSUM of squares tests were applied, and the results of both tests confirm the stability of our model (Appendix D., Figures D9 and D10).

#### 2.4.5.3 Results in the United Arab Emirates

The short-run results show that TFP depends on its lag. The coefficient is 0.46, which indicates that a 1% change in the lag of TFP causes a change in the current TFP by 0.46%. There is a significant positive impact of resource rents (% of GDP) on TFP in the short-run; as the percentage of resource rents in GDP increases by 1%, TFP increases by 0.12%. Significantly, corruption negatively affects TFP in both the short and long-run by 0.08% and 0.14%, respectively, in response to a 1% increase in corruption. However, human capital shows a positive impact on TFP in both the short and long-run by 0.1% and 0.18%, respectively, per 1% increase in human capital. Additional evaluation of the data and results is available in Appendix C. (Figure C6, Section 2.3).

The results of both stability tests—the CUSUM and CUSUM of squares tests—confirm the stability of the model (Appendix D., Figures D11 and D12).

### 2.4.6 Overall Discussion

This section provides an interpretation of the results of the impact of natural resources, institutional quality, and human capital on total factor productivity in the three countries, and the results are compared with the results from previous studies.

#### 2.4.6.1 Natural Resource Rents

First, the positive relationship between resource rents (% of GDP) and productivity in KWT and the UAE in the short-run contradict the resource curse theory (Corden and Neary, 1982). This is evidence that resource revenues in KWT and the UAE are advantageous to the country. The possible explanations are related to the huge resource windfalls that encourage productive projects and investments, together with the resource sector that adds well-paying jobs, and contribute little to technology transfer and productivity. This finding aligns with that of Brunnschweiler (2008) and is clarified in the traditional economic theory (Wen, 2011). However, this positive relationship becomes negative in the long-run in KWT. This suggests a phenomenon that is similar to the resource curse theory of a negative relationship between resource rents (% of GDP) and TFP (Corden and Neary, 1982); hence, it is alarming for KWT. The case in KSA is opposite that of KWT and the UAE. The percentage of resource rents in KSA GDP has a significant negative impact on TFP after two years, and it becomes positive in the long-run in KSA. One possible explanation of this situation has been provided in the resource curse literature is that resource-rich countries tend to overinvest in the energy sector and neglect of other tradeable sectors that are beneficial to productivity and long-run growth (Corden, 1984; Corden and Neary, 1982). However, in the long-run, resource-rich countries start diversifying their economy, building new projects, and creating more jobs as they get richer over time (Gelb, 2010), resulting in higher TFP.

#### 2.4.6.2 Institutional Quality

Corruption, as a proxy of institutional quality, is harmful to productivity in all cases. The negative effect of corruption on TFP in the short-run in KSA and the UAE is as expected since this relationship has been confirmed in different studies (Boschini et al., 2013; Boschini et al., 2007; Mehlum et al., 2006). Most importantly, in the long-run, corruption reduces TFP in KWT, the UAE, and KSA, which supports an important principle that corruption renders governments capability of achieving efficiency and harms public welfare (Lambsdorff, 2002). Moreover, corruption causes wasteful rent-seeking activities, distorted public decisions, neglect of contracts' quality checks on governments' projects, and low-quality investments, consequently, lowering productivity (Haapanen and Tapio, 2016; Perera and Lee, 2013; Acemoglu and Robinson, 2010). The same results were reported by Rose-Ackerman and Palifka (2016), Lambsdorff (2002), and Bardhan (1997).

However, when testing the second proxy of institutional quality—law and order—the only country that shows a positive impact on TFP in both the long and short-run is KWT. The higher the quality of institutions, the higher TFP, as proved in different studies (Boschini et al., 2013; Boschini et al., 2007; Mehlum et al., 2006). The results are insignificant in the UAE, although the results for KSA show that law and order, as well as the two-year lag form of law and order, have a negative impact on productivity in the short-run. The results in KSA contradict the literature, and one probable cause for this effect in the case of KSA that the law is strictly enforced, and the local traditions, customs, and religions must always be obeyed in an approach or manner that could affect productivity (Fallatah et al., 2019).

#### 2.4.6.3 Human Capital

Once again, important results are found for human capital. It affects TFP positively in KWT and the UAE in the short-run, while the one-year lag of human capital shows the same impact in KWT. Over the long-run, human capital is found to improve TFP in KWT, KSA, and the

UAE. This supports an important principle that states that human capital in the form of education, knowledge, and skills are essential for technology and innovation, which improve productivity, and that educated workers are more capable of carrying out jobs that need critical thinking, skills, and literacy, all of which lead to higher productivity (Gennaioli et al., 2013; Ciccone and Papaioannou, 2009). Several papers have revealed the same results, including Kumar and Chen (2013), Liberto et al. (2011), Nachega and Fontaine (2006), Bauer et al. (2006), Bensi et al. (2004), Aiyar and Feyrer (2002), and Benhabib and Spiegel (1994). In KSA, the case is different in the short-run. The negative effect of human capital on TFP in the current and two-year lag form is surprising, but according to Temple (1999), the effect of education has generally varied among the countries.

The possibilities for this negative relationship were questioned by Pritchett (2001), who then proposed a few possibilities that are mutually implicated and are likely to present in every country to a varying degree. One reason is the misguided educational expenditures that could go to piracy and private remuneration, but those activities are socially unproductive and thus harm productivity. Further, when the educational system suffers from failures, the outcomes are disappointing for participants who have no or few skills. Moreover, he explained that the demand for an educated workforce might be slow, so supply exceeds the demand. As a result, the number of individuals who return to school and productivity deteriorates rapidly. Then, in the long-run, these skills and knowledge attained by population begin to bear fruitful benefits to the country, thus increasing productivity (Kumar and Chen, 2013). This result regarding the positive relationship between human capital and TFP is aligned with studies by Kumar and Chen (2013), Liberto et al. (2011), Aiyar and Feyrer (2002), and Benhabib and Spiegel (1994).

## 2.5 Conclusion

The occurrence of the resource curse is related to the deteriorating development measures from the existence of natural resource wealth and especially the over-reliance on the revenues gained from the exportation and production of natural resources.

Thus, this study is presented as an initial attempt to clarify the resource curse dilemma and identify the transmission channels that drive the resource curse, so this study has focused on only the economic drivers, which highlight the negative relationship between natural resources and economic growth. Nevertheless, some scholars have debated whether the resource curse even exists or whether the economic outcomes are the result of other factors, such as poor institutional quality or neglected human capital.

To provide a precise answer to this debate, it is necessary to conduct this study that examined the existence of the resource curse in Gulf Countries by studying the impact of natural resource rents (% of GDP) on per capita GDP and total factor productivity and taking the institutional quality and human capital as covariates. The three questions examined in this study have focused on whether natural resources' dependency increase PGDP and TFP; whether institutional quality increases PGDP and TFP, and whether human capital improves PGDP and TFP in the short-run and long-run in Gulf Countries. The study applied the ARDL model and co-integration technique by using time series data from 1984-2014.

The results indicate that, in the long-run, the natural resource rents (% of GDP) have a significant positive impact on per capita GDP in KSA and the UAE but no discernable impact in KWT. Moreover, resource rents (% of GDP) have a significant positive impact on TFP in KSA, a negative effect in KWT, and undetectable effects in the UAE. These findings indicate that huge windfalls from resources are not contributing to increases in productivity or growth. Thus, high dependency on rents from natural resources could be harmful to Gulf Countries, especially KWT, in the long-run. Moreover, the results suggest that an increase in the level of human capital in the form of education increases productivity and PGDP in the three countries. According to Ozturk (2001), economic development is difficult without education; thus, human capital is a crucial factor to achieve long-term growth and productivity in the region. Further, corruption, as a measure of institutional quality, decreases productivity in the long-run in the three countries and decreases PGDP in KWT. Law and order increase productivity in KWT and PGDP in KWT and the UAE. Since institutions and human capital are proved to be crucial to growth in the three countries, the governments have to tailor these two factors to the country's goals and circumstances.

The evidence in this study illustrates that natural resources by themselves are not a curse in the long-run for the UAE and KSA. However, for them to promote growth, they need to be combined with human capital and institutional quality, as supported by empirical and theoretical studies. It is clear is that corruption plays a vital role in the declining productivity and growth in the three countries.

Since we examine the impact of natural resource dependency on economic growth, the question that arises is whether these resources have any impact on institutional quality and human capital. The uncertainty in these effects is considered a caveat in interpreting this research and motivation to start the next study.

The findings are of particular importance for governments in resource-rich countries who aim to manage the huge revenues generated from natural resources in a sustainable manner.

This study supports the fact that TFP and PGDP can be increased by properly managing these revenues, investing in human capital, and maintaining a good institutional environment, as supported in previous studies, as well.

However, future analysis is needed to determine the different necessary policies and their impact on productivity and growth and, most importantly, to find the most efficient approach to managing natural resource rents and utilize these rents between sectors. If a resource-rich country perfects this activity, other advantageous outcomes will follow, and high productivity and growth can be realized.

# 3

# THE SHORT- AND LONG-TERM IMPACTS OF NATURAL RESOURCES ON INSTITUTIONAL QUALITY IN GULF COUNTRIES

## 3.1 Introduction

The notion in economics that abundant resources can be a curse rather than a blessing has a long history. From as early as the 16th century, economists noted the destabilizing effects of the influx of gold from Latin America (Auty 1993; Prebisch, 1950; Singer 1950). More recently, economists have observed that some of the fastest growing economies have been largely resource poor, while resource abundant countries have suffered virtual economic collapse (Sala-i-Martin and Subramanian, 2013)**.** This narrative often points to the presence of the so-called "Resource Curse", which explains how resource abundant countries suffer from sluggish economic growth and particularly low levels of per capita GDP (Badeeb et al., 2017; Van der Ploeg, 2011; Papyrakis and Gerlagh, 2007; Kalyuzhnova and Kaser, 2006; Bulte et al., 2005; Rodriguez and Sachs, 1999).

There has been intense interest in the underlying factors responsible for the varying experiences of countries and the mechanisms through which resource endowments could either enhance or impede per capita GDP and economic growth (Badeeb et al., 2017; Van der Ploeg, 2011; Kalyuzhnova et al., 2009).

Several studies have highlighted the importance of institutional quality and human capital in the literature regarding the resource curse (Olayungbo and Adediran, 2017; Godwin and Chuka, 2014; Faruq and Taylor, 2011; Hanushek and Woessmann, 2007) and their significance for long-term growth and development (Nawaz et al., 2014; Valeriani and Peluso, 2011; Rodrik et al., 2004). Institutional quality is a concept that captures the effectiveness of law, individual rights, and government regulations and services (Hodgson, 2006; Knack and Keefer, 1995), whereas human capital is the skills and knowledge that individuals build, maintain, and practice (Armstrong, 2006; Romer, 1990).

The explanation of the resource curse that focuses on the relationship between natural resource wealth and institutional quality and how this relationship affects growth is known as the political explanation of the resource curse (Ross, 1999). There has been an upsurge of interest regarding this relationship, and a negative link has been traced between resource abundance and economic growth to rent-seeking, corruption, institutions, and policies in resource rich countries (Zalle, 2019; Douglas and Walker, 2017; Okada and Samreth, 2017; Olayungbo and Adediran, 2017; Antonakakis et al., 2017; Eregha and Mesagan, 2016; Farhadi et al., 2015; El Anshasy and Katsaiti, 2013; Sala-i-Martin and Subramanian, 2013; Busse and Groening, 2013; Anthonsen et al., 2012; Collier and Goderis, 2012; Torvik, 2009; Andersen and Aslaksen, 2008; Brunnschweiler, 2008; Costantini and Monni, 2008; Hodgson, 2006; Hodler, 2006; Mehlum et al., 2006; Ross, 1999; Knack and Keefer, 1995).

Although the literature generally shows that resource rents cause a deterioration in institutional quality, human capital accumulation is found to improve institutional quality, which could provide some insulation from the negative impacts of the resource curse (Aljarallah and Angus, 2019; Zalle, 2019; Raggl, 2017) because human capital introduces awareness and creativity in society and discourages corruption, hence increasing the quality of institutions (Psacharopoulos, 1994; Lau, et al., 1991).

In fact, the importance of human capital and institutions as key drivers of economic growth and development has gained importance in the literature (Faruq and Taylor, 2011; Hanushek and Woessmann, 2007). However, the associations between institutions and human capital remain the subject of ongoing debate, with some studies suggesting an interdependent and unique relationship between institutional quality and human capital in each country (Tebaldi and Elmslie, 2013; Dias and Tebaldi, 2012; Coe et al., 2009; Castello-Climent, 2008; Brunnschweiler and Bulte, 2008; Bulte et al., 2005; Glaeser et al., 2004; Engerman and Sokoloff, 2002; Psacharopoulos, 1994; Lau, et al., 1991). However, few studies have found a link between natural resources, institutional quality, and human capital (Faria et al., 2016; Acemoglu et al., 2014; Suslova and Volchkova, 2012; Acemoglu et al., 2005; Bulte et al., 2005; Gylfason, 2001; Aron, 2000). Hence, it is important to address the impact of human capital on institutional quality, particularly in resource rich countries as a way to present a comprehensive picture of which factors have a dominant impact on institutional quality specifically in oil rich countries, taking into consideration that every country has its own circumstances and conditions.

In this light, this section sets out to investigate the short and long-term impacts of rents from non-renewable natural resources (RR), per capita GDP (PGDP), and human capital (HC) on institutional quality (IQ) in the oil rich countries of Kuwait (KWT), the Kingdom of Saudi Arabia (KSA), and the United Arab Emirates (UAE). Typically, oil revenues in these countries present a high proportion of their GDP (World Bank, 2019), thereby making them candidates for the resource curse effect (Appendix A.). However, to date, there has been little research as to the existence of the resource curse in these countries as opposed to other studies that have targeted different resource rich countries like Nigeria (Zubikova, 2017), Myanmar (Pick and Thein, 2010), and Algeria (Akacem and Cachanosky, 2017). Therefore, this paper is a first time series study of its nature to be conducted in these specific Arab oil-rich countries. This is an important study and relevant to an international audience because Gulf Countries (GCs) can be considered as an example to either follow or learn from their experiences as countries that are rich in natural resources, dominating 30% of the world's oil reserves and GDPs equal to $1.6 trillion. They depend directly and indirectly, to a large extent, on natural resources for most of their activities, export revenues, and foreign exchange. GCs are both militarily and economically important to the world. They enjoy a strategic location that facilities their role as key trading partners to the world; nearly one third of US oil is supplied by the GCs. Furthermore, they are important members of OPEC, who have an influence on international energy prices.

Using a time series dataset of the three case studies covering the period from 1984 to 2014, the study concludes that natural resource rents are negatively associated with the quality of institutions in the short-run in KWT, the KSA, and the UAE, while controlling for some additional variables. Therefore, institutional quality appears to have a serious role in mediating the effects of natural resources on growth. The results in this study further demonstrate that the impact of natural resource rents differs in each country according to the settings and conditions in that country.

This rest of this research paper is organized as follows. Section 3.2 presents a literature review of this topic, Section 3.3 sets out an empirical model to meet the study aims and presents the data and description of the variables, while Section 3.4 illustrates the results and analysis, and Section 3.5 presents our conclusions.

### 3.2 Literature Review

Institutions identity the structure of the incentives that may impede or increase activities in the society (North, 1981). Furthermore, institutions are considered as one of the major determinants of economic growth and cause differences in the development progress across countries and per capita GDP (Ugur, 2014; Valeriani and Peluso, 2011; Acemoglu and Robinson, 2010; Rodrik et al., 2004; Treisman, 2000; Hall and Jones, 1999). Institutional quality is a concept that captures the individual rights, beliefs, and rules that shape behaviors and formulate collective action, hence conditioning development (Islam and Montenegro, 2002; North, 1990). Economists generally agree that good or poor outcomes from any policies designed to enhance economic growth are mainly contingent on the institutional quality within an economy (Farhadi et al., 2015; Sarmidi et al., 2014; Robinson et al., 2006; North, 1994; Murphy et al., 1993; Barro, 1991). Accordingly, good institutional quality may encourage an incentive structure that decreases uncertainty and promotes efficiency, hence leading to higher growth (North, 1990), whereas poor institutional quality impedes economic activities that promote growth by supporting activities with low economic returns (Murphy et al., 1993).

Knack and Keefer (1997) suggest that finding a correct measure of institutional quality is considered the most difficult task in such studies and proposed that the ideal measures would consist of objective evaluations of institutions that protect property and contractual rights, and that these evaluations should be comparable over time and across countries. However, several measures of institutional quality have been used when judging this across the literature field. For instance, expropriation risk was used by Acemoglu et al. (2001), the Economic Freedom of the World from the Fraser Institute was used by Beland and Tiagi (2009), and the Freedom House Index was used by Barro and Sala-i-Martin (1997). The most common measures of institutional quality are the World Bank Governance Indicators, which was used by Sala-i-Martin and Subramanian (2013), Rodrik et al. (2004), Easterly and Levine (2003), and the International Country Risk Guide (ICRG) that was used by Chong and Calderon (2000), Hall and Jones (1999), Knack (1999), and Knack and Keefer (1997). Furthermore, the ICRG was used recently by scholars in the resource curse literature (Okada and Samreth, 2017; Busse and Groening, 2013; Boschini et al., 2013).

The resource curse explanation that focuses on institutional quality and political factors (Caselli and Cunningham, 2009; Rosser, 2006) has the principal argument that natural resource rents as measured by income from oil, gas, and minerals, tend to increase corruption and rent-seeking behavior, which in turn reduces economic growth as well as per capita GDP (Boschini et al., 2013; Mavrotas et al., 2011; Kalyuzhnova et al., 2009; Dalgaard and Olsson, 2008; Isham et al., 2005; Woolcock et al., 2001; Leamer et al., 1999). The state typically owns natural resource industries in resource rich countries, which encourages the abuse of resource windfalls by public officials and damages the quality of political institutions. This mismanagement could delay economic progress, consequently, the resource curse arises because of resource rents, rather than from the existence of natural resources in the country (Antonakakis et al., 2017; Sala-i-Martin and Subramanian, 2013; Kalyuzhnova et al., 2009;

Kolstad and Wiig, 2009; Robinson et al., 2006; Bulte et al., 2005; Baland and Francois, 2000; Leite and Weidmann, 1999; Karl, 1997).

Studies analyzing the effects of resource rents on institutional quality can be divided into two broad categories. The first strand of literature suggests that the abundance of natural resources is strongly associated with corruption, democracy deterioration, and armed conflict (Olayungbo and Adediran, 2017; Apergis and Payne, 2014; Costa and Santos, 2013; Di John, 2011; Bhattacharyya and Hodler, 2010; Ades and Di Tella, 1999), which is not solely a problem for countries with pre-existing poor institutional quality. The second strand of literature takes the view that the existence of the resource curse is conditional on the pre-existing institutional quality, so natural resources can only harm growth in countries with pre-existing poor institutional quality (Boschini et al., 2013; Bakwena, 2012; Mehrara et al., 2011; Mavrotas et al., 2011; Collier and Hoeffler, 2009; Torvik, 2009; Mehlum et al., 2006; Papyrakis and Gerlagh, 2004) because the combination of natural resources and low levels of institutional quality allows interest groups to closely control resource rents, hence disturbing economic development (Boschini et al., 2007; Bulte et al., 2005; Isham et al., 2005; Rodrik et al., 2004).

For studies that have followed the first strand of thinking, natural resources whose production or extraction is concentrated in a specific geographic or economic area facilitates the control of rents by interest groups and this form of governance is typically associated with poor institutions that deliver an inadequate quality of governance (Boschini et al., 2007; Bulte et al., 2005; Isham et al., 2005). Boschini et al. (2007) found that the type of natural resources a country owns is crucially important in shaping the country’s development. For instance, ‘point source’ natural resources such as minerals, oil, and plantation crops are more problematic than agricultural products, as point resources are geographically concentrated and are more easily controlled (Isham et al., 2005; Bulte et al., 2005; Ross, 1999; Leite and Weidmann, 1999).

Evidence for this strand of literature include Anthonsen et al. (2012), who found that oil and gas dependence had a negative effect on three dimensions of government quality including corruption, bureaucracy, and legal partiality. Busse and Groening (2013) and Norman (2009) found that countries with a higher stock of natural resources had subsequently lower levels of rule of law. These point resources may have greater adverse economic effects on institutional quality and economic growth relative to other resources (Sala-i-Martin and Subramanian, 2013; Karabegovic, 2009; Petermann et al., 2007; Leite and Weidmann, 1999). Moreover, Ross (1999) identified minerals as the only type of resource that has been consistently correlated with low levels of institutions and underlined that minerals were the key variable in most of the resource curse studies.

In support of the second strand of literature, Sala-i-Martin and Subramanian (2013) found that natural resource abundance had a serious negative impact on the quality of domestic institutions and subsequently on long-term economic growth. The authors examined Nigeria and found that its disastrous development path has been driven by waste and corruption (poor institutional quality). This finding was also supported by Ologunla et al. (2014) when they examined institutions and resources in Nigeria. Kalyuzhnova et al. (2009) examined 48 resource rich countries and found that corruption is the reason of the reduction in per capita GDP. Bjorvatn and Selvik (2008) presented a case study in Iran about the association between resource rents, institutions, and economic performance. They found that economic performance in Iran was negatively affected by the factionalized political system of its institutional environment, which controls the management of its resources. Du Plessis and Du Plessis (2006) evaluated Zambia's relatively poor growth and related it to the resource curse. They found that the decline was not caused by their dependence on copper; rather, this dependence worsened the impact of poor-quality institutions on its growth, mainly due to the failure to protect property and contract rights.

There is now an abundance of evidence supporting the view that the resource curse manifests as an impact of resource rents and their deleterious effect on institutional quality. Few studies have argued that the resource curse can be avoided if political regimes enhance institutions by enforcing property rights and showing a predictable legal system (Bulte et al., 2005; Ross, 1999). Sarmidi et al. (2014) found empirical evidence to conclude that good institutional quality was an important element in fostering economic growth in resource rich countries and that institutions could neutralize the effect of the resource curse; this view was also supported by Apergis and Payne (2014), Costa and Santos (2013), and Rodrik et al. (2004). Moreover, Leite and Weidmann (1999) stated that a good institutional arrangement was necessary for the management of efficient and optimal resources. A study by Apergis and Payne (2014) showed that the unfavorable effects of oil on the performance of the economy could be reduced by better institutional quality in Middle East and North Africa countries, since good institutions are often associated with high economic freedom, which in turn promotes economic growth. Similarly, Beland and Tiagi (2009) supported the importance of good institutions for growth.

However, it should be noted that there is some evidence that disputes the link between resource rents, institutional quality, and the resource curse. Brunnschweiler and Bulte (2008) challenged the view that resource abundance caused a deterioration in the effectiveness of national institutions and governance and concluded that resource abundance affected institutional quality and growth positively. Likewise, Brunnschweiler (2008) found no evidence of negative indirect effects of resource abundance through the institutional transmission channels, concluding that natural resources were unrelated to growth and institutional quality. Although many resource rich countries have weak institutions and relatively slow development, Bjorvatn et al. (2012) argued that a strong government, even with weak institutions, should be enough to use resources as one of those assets that enhances growth. Yang (2010) argued that institutional quality had no effect on the severity of the resource curse but related the major role to policies aimed to minimize the negative impacts of resource abundance. It should be noted that, on balance, this study holds the minority view. All in all, the link between economic growth and institutions has been well documented by many studies, and on balance, the weight of the evidence suggests that there is a link between natural resources and institutional quality, which in turn impacts economic growth (Haapanen and Tapio, 2016; Hall and Ahmad, 2014; Perera and Lee, 2013; Dias and Tebaldi, 2012; Acemoglu and Robinson, 2012, 2010; Aidt et al., 2008; Rodrik et al., 2004; Acemoglu et al., 2002, 2001; Hall and Jones, 1999).

In terms of human capital, some authors have suggested that high levels of oil production and the resulting incomes, coupled with weak institutions, may result in little opportunity to improve educational levels (Suslova and Volchkova, 2012; Gylfason, 2001; Aron, 2000). Moreover, Bulte et al. (2005) found that first, natural resources damaged institutional quality, and then these institutions harmed human capital, thus resource rich countries tended to experience lower levels of human development. This strand of the resource curse, and precisely, the direct and indirect impact of natural resources on human capital through institutional quality will be tackled in the next section in this paper. As human capital shows an important role in the resource curse literature, as per Gylfason (2001), where low investment in education in resource rich countries is a critical reason behind their slow development as it relates it to the income security from the resource rents and the fact that resource extraction is very capital-intensive. An alternative explanation introduced by Isham et al. (2005) was that the ruling elite in countries with point-source resources are encouraged to impede modernization including education and modern industry, since they consider it as a risk to them losing power and present this as a “delayed modernization” effect.

However, most studies have suggested that rather than being separate, institutional quality tends to be interdependent with human capital. Several studies have analyzed the link between human capital and institutions from different angles (Tebaldi and Elmslie, 2013; Dias and Tebaldi, 2012; Coe et al., 2009; Castello-Climent, 2008; Glaeser et al., 2004; Engerman and Sokoloff, 2002). These studies found that countries with a strong institutional quality such as the protection of property rights, control of corruption, market friendly policies, and effective judiciary system experienced higher rates of innovation (Tebaldi and Elmslie, 2013), higher rates of research and development investments, and human capital formation (Coe et al., 2009). It has been argued that human capital accumulation contributes positively to institutional quality, which fosters growth (Galor et al., 2009; Castello-Climent, 2008; Glaeser et al., 2004; Lipset, 1960). Human capital introduces awareness, creativity, and behavioral in the society, hence increasing institutional quality (Psacharopoulos, 1994; Lau, et al., 1991). Additionally, Faria et al. (2016) highlighted the important role of human capital in enhancing institutional quality. Lucas (1988) asserts that human capital accumulation produces institutions symbolized by the average knowledge of the society. However, this knowledge creation depends on institutional quality (Romer, 1990), as good institutions facilitate all aspects that prompt research and development activities such as ease in registering new patents, encouraging new projects, distributing ideas, and improving the enforcement of property rights (Tebaldi and Elmslie, 2013). Acemoglu et al. (2014, 2005) found that human capital had little impact on economic growth, but that this impact was likely to be an outcome of institutions. On a different note, the literature also shows that resource rents in these resource rich countries damage institutional quality, while human capital accumulation has been found to improve institutional quality, which could provide some insulation from the negative impacts of the resource curse. Higher educational levels help in the management of natural resources by supporting technologies and innovations that assure the efficient use of resources and thus reduces dependence on them. Moreover, education encourages the development of tradeable sectors as an alternative to high dependence on resource sectors (Kurtz and Brooks, 2011; Stijns, 2006).

Overall, there is no consensus over the link between institutional quality, human capital, and resource rents, and many suggest that the link varies for each country (Badeeb et al., 2017; Brunnschweiler and Bulte, 2008; Bulte et al., 2005). As a result, the impact of resource rents on institutional quality has to be addressed with a case study approach to clarify the variations in the conditions and experiences of each resource rich country. Furthermore, the impact of human capital and per capita GDP on institutional quality remains relatively unexplored, especially for policy makers and producers of resources in developing countries (Zalle, 2019; Raggl, 2017; Torres et al., 2012). To the best of our knowledge, this study provides the first analysis of the selected Gulf Countries.

## 3.3 Research Methodology and Data

### 3.3.1 Theoretical Model

The importance of domestic institutions for explaining the correlation between natural resource wealth and economic growth has been emphasized in numerous studies (Douglas and Walker, 2017; Eregha and Mesagan, 2016; Sala-i-Martin and Subramanian, 2013; Anthonsen et al., 2012; Torvik, 2009; Brunnschweiler, 2008; Costantini and Monni, 2008; Easterly and Levine, 2003; Tornell and Lane, 1999).

In this study, corruption was taken as a proxy of institutional quality. As the literature suggests, resource rents (RR) contribute to rent-seekingbehaviors and corruption in a resource rich country (Apergis and Payne, 2014; Sarmidi et al., 2014; Ologunla et al., 2014; Costa and Santos, 2013; Bjorvatn and Selvik, 2008; Brunnschweiler, 2008; Stijns, 2006). It is assumed that the higher per capita GDP (PGDP), the higher the demand for better institutional quality (IQ) and transparency, which is consistent with Treisman (2000). Moreover, law and order (LO) is found to be strongly correlated to corruption (Knack and Keefer, 1997). Finally, human capital (HC) introduces an awareness in society that discourages corruption (Dias and Tebaldi, 2012). In this regard, it is considered that there can be a relationship among these variables.

$$IQ = f(RR, HC, LO, PGDP) \tag{3.1}$$

### 3.3.2 Empirical Model and Estimation Procedure

In this section, the impact of resource rents (RR) on institutional quality (IQ) is examined empirically, by taking law and order (LO), human capital (HC), and per capita GDP (PGDP) as the covariates. The previous paragraph clarified that the rationale to include these variables is consistent with the literature, thus the exclusion of any of these variables from the model would lead to the occurrence of the problem of omitted-variable bias (OVB), which occurs when a statistical model omits one or more important variables, hence bias results.

$$IQ_t = \alpha_o + \theta_1 RR_t + \theta_2 HC + \theta_3 LO_t + \theta_4 PGDP_t + \mu_t \tag{3.2}$$

where $\alpha_o$ is the intercept, $\mu_t$ is the error term, and subscript *t* is used to indicate that the data form a time series.

#### 3.3.2.1 Autoregressive Distributed Lag Model

To derive the short-run and long-run results, this study applied the autoregressive distributed lag model (ARDL). The general form of the ARDL model of Equation (3.2) is as follows:

$$\begin{aligned}\Delta IQ_t = {} & \alpha_0 + \sum_{i=1}^{t} \delta_i \Delta IQ_{t-i} + \sum_{i=1}^{t} \rho_i \Delta RR_{t-i} + \sum_{i=1}^{t} \varphi_i \Delta HC_{t-i} \\ & + \sum_{i=1}^{t} \omega_i \Delta LO_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta PGDP_{t-i} + \lambda_1 IQ_{t-1} + \lambda_2 RR_{t-1} \\ & + \lambda_3 HC_{t-1} + \lambda_4 LO_{t-1} + \lambda_5 PGDP_{t-1} + \mu_t \end{aligned} \tag{3.3}$$

where $\alpha_0$ is the drift component and the terms $\delta_i$, $\rho_i$, $\emptyset_i$, $\omega_i$, and $\varphi_i$ are the parameters used for short-run analysis, while $\lambda_1$, $\lambda_2$, $\lambda_3$, $\lambda_4$, and $\lambda_5$ are used for estimating the long-run parameters. The Wald restriction test is used to test the long-run relationship or cointegration between the dependent and independent variables. The value of the F-test is taken by applying the coefficient diagnostic Wald restriction test on long-run variable parameters. The hypothesis for the cointegration test is:

$H_0 = \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$ (No co-integration)

$H_1 = \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq 0$ (Co-integration presents)

The F-test is based on the number of regressors in the model. If the F-stat value is greater than the value of the upper bound, then the null hypothesis will be rejected to conclude that there is cointegration and that long-run relationships exist between the dependent and independent variables. If the value of the F-stat is lower than the bound value, then the null hypothesis is not rejected and shows that there is no cointegration, in other words, long-run associations do not exist between the regressors. However, if the F-stat is between the lower bound and upper bound, then it shows that the result is inconclusive and there is cointegration.

The orders of the lag length in the ARDL model are selected either through the Akaike's Information Criteria (AIC) or through the Schwarz Bayesian Criterion (SBC). If the cointegration is statistically significant, then the values of the long-run parameters can be found by normalizing the long-run equation and estimating the error correction model for short-run analysis.

Under the assumption of the steady-state condition, the long-run Equation is $\Delta IQ_i = 0$, which means that $\Delta IQ = IQ_t - IQ_{t-1} = 0 \Rightarrow IQ_t = IQ_{t-1}$.

By applying the above assumption and dividing by $\lambda_1$, Equation (3.3) can be written in the long-run form as follows:

$$\frac{\lambda_1}{\lambda_1} IQ_t = \frac{\lambda_2}{\lambda_1} RR_{t-1} + \frac{\lambda_3}{\lambda_1} HC_{t-1} + \frac{\lambda_4}{\lambda_1} LO_{t-1} + \frac{\lambda_5}{\lambda_1} PGDP_{t-1}. \tag{3.4}$$

Now by re-parameterizing,

$$IQ_t = \psi_o + \psi_1 RR_{t-1} + \psi_2 HC_{t-1} + \psi_3 LO_{t-1} + \psi_4 PGDP_{t-1}. \tag{3.5}$$

Now, $\psi_1, \psi_2, \psi_3, and\ \psi_4$ are the long-run parameters and their values and signs determine the long-term relationship between the dependent variable and the independent variables in the model. For short-run analysis, the error correction model was used.

#### 3.3.2.2 Error Correction Model

When a long-run relationship exists between the variables, then there is an error correction representative model, so the following error correction model is estimated in the third step.

$$\begin{aligned} \Delta IQ_t = \alpha_0 + \sum_{i=1}^{t} \delta_i \Delta IQ_{t-i} + \sum_{i=1}^{t} \rho_i \Delta RR_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta HC_{t-i} \\ + \sum_{i=1}^{t} \omega_i \Delta LO_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta PGDP_{t-i} + \gamma ECM_{t-1} \end{aligned} \tag{3.6}$$

The error correction model indicates the speed of adjustment of the short-run shocks back to a long-run equilibrium, so the coefficient of the $ECM_{t-1}$ determines the speed of adjustment toward equilibrium in the case of any disturbances.

### 3.3.2.3 Data and Variables Description

The dependent (DV) and independent variables (IV) in the model are clarified in the diagram below (Figure 3.1), where (IV3) is the variable of interest.

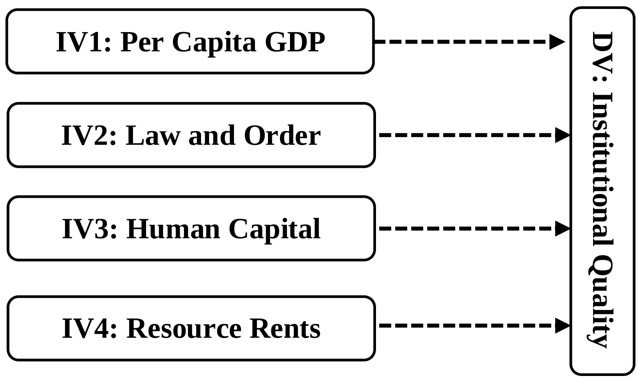



**Figure 3.1.** The dependent and independent variables.
Source: calculated by the author.

The description of the variables and the rationale for their inclusion in the model are presented below.

Corruption was the dependent variable in this study. It was used as a proxy of institutional quality (IQ) by following several previous studies that have used this proxy for IQ (Tebaldi and Elmslie, 2013; Busse and Groening, 2013; Anthonsen et al., 2012; Boschini et al., 2007; Leite and Weidmann, 1999; Knack and Keefer, 1995). The data were taken from the International Country Risk Guide (ICRG) by the PRS Group from 1984 to 2014. The ICRG is a widely used source because of its comprehensive coverage over time and countries as most of the observations started in 1982. Corruption is measured as a ‘control of corruption’ on a scale of 0–6, so the lower the score of the country, the lower the control of corruption, and the more likely the country suffers from a low efficiency and quality of institutions, hence growth (Knack and Keefer, 1995). However, in this study, the score was inverted to express corruption, which was a similar approach taken by Okada and Samreth (2017). Corruption in the ICRG is "concerned with actual or potential corruption in the form of excessive patronage, nepotism, job reservations, 'favor-for- favors', secret party funding, and suspiciously close ties between politics and business" (ICRG, 2017). In our view, these insidious forms of corruption are potentially of much greater risk to foreign business in that they can lead to popular discontent, unrealistic, and inefficient controls on the state economy, and encourage the development of the black market" (ICRG, 2017). The corruption levels varied slightly between the three countries under study, with the UAE revealing the lowest level of corruption (Figure 3.2).

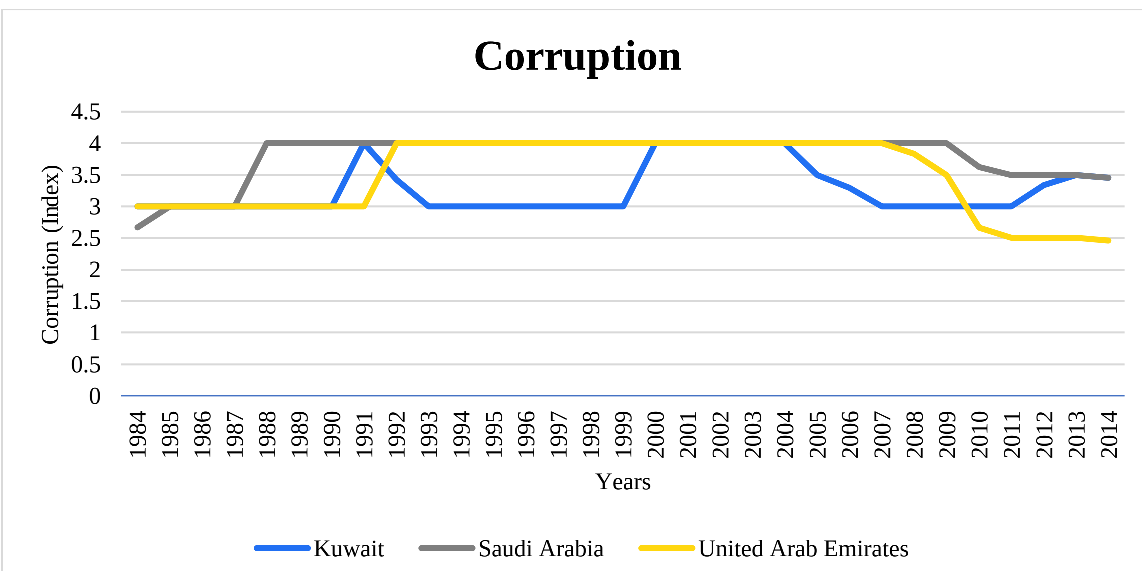



**Figure 3.2.** Corruption Index.
Source: Author, based upon data taken from the ICRG (2017).

It is assumed that the higher the per capita GDP, the higher the demand for better institutional quality and transparency (Serra, 2006; Treisman, 2000). Furthermore, relatively affluent countries have the financial resources to fight corruption and improve government regulations (Busse and Groening, 2013). This study introduced per capita GDP (PGDP) as an independent variable and the natural logarithm was taken for this variable. The data is from the World Development Indicators (WDI) provided by the World Bank (2017) for the period 1984–2014. This was measured in constant US dollars and was divided by the population of each Gulf country for each year in the period of our analysis to obtain the PGDP, and the population data were also provided by the World Bank. As per Antonakakis et al. (2017), the PGDP approximates the degree of development, and many studies have selected the use of this variable (Olayungbo and Adediran, 2017; Akpan and Chuku, 2014; Apergis and Payne, 2014; Busse and Groening, 2013; Arezki and Van der Ploeg, 2011; Kalyuzhnova et al., 2009). As shown in Figure (3.3a), KWT showed a high PGDP up until 2013, when the UAE exceeded the level of KWT. However, the KSA had the lowest PGDP for a long period of time. The opposite situation can be seen in Figure (3.3b) for the GDP levels where KSA enjoyed high levels of GDP while KWT had the lowest GDP.

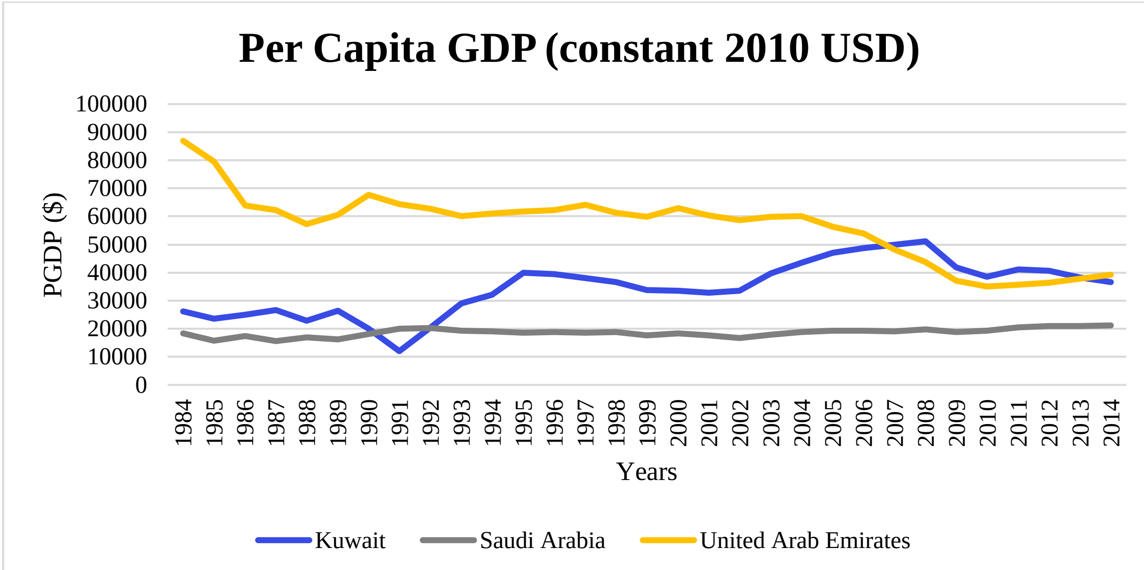



**Figure 3.3a.** Per Capita GDP (constant 2010 USD).
Source: Author, based upon data taken from the World Bank (2017).

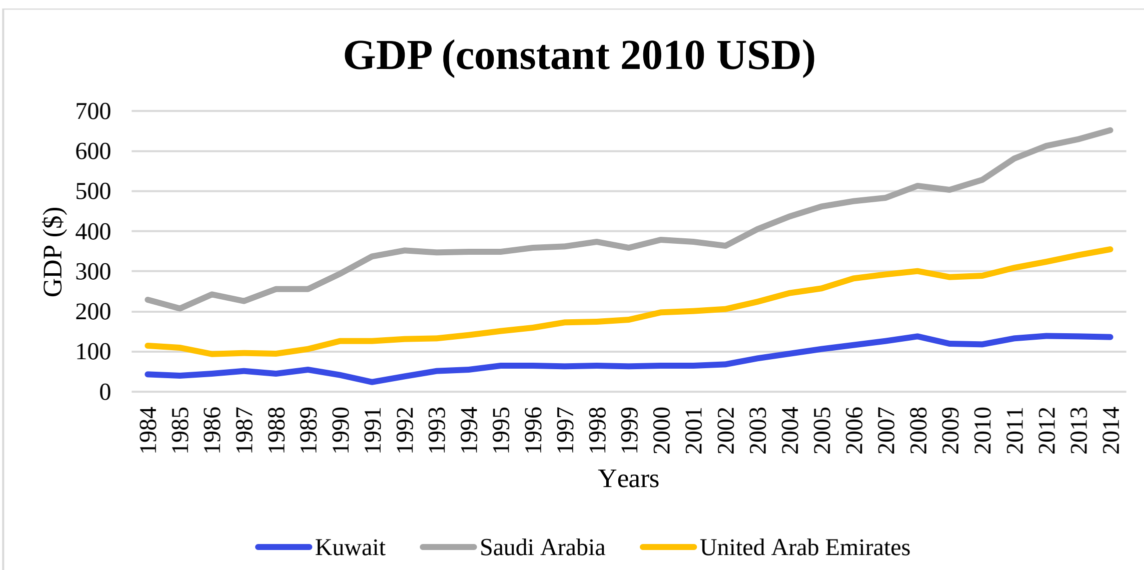



**Figure 3.3b.** GDP (constant 2010 USD).
Source: Author, based upon data taken from the World Bank (2017).

The variable of 'law and order' (LO) is defined as a set of formal rules that partially regulates behavior, quantifies the strength and independence of the legal system, and is established on objective trust in the laws and institutions (ICRG, 2017). The data were taken from ICRG, following Busse and Groening (2013) and Anthonsen et al. (2012). This measure is based on a scale of 0–6 in ICRG and consists of two subcomponents, each covering 0–3 points. The 'Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of the popular observance of the law' (ICRG, 2017). The lower the score in this index, the less the impartiality of the legal system. In the three countries under examination, KWT and the KSA showed almost the same level of law and order, with the UAE revealing a lower level (Figure 3.4).

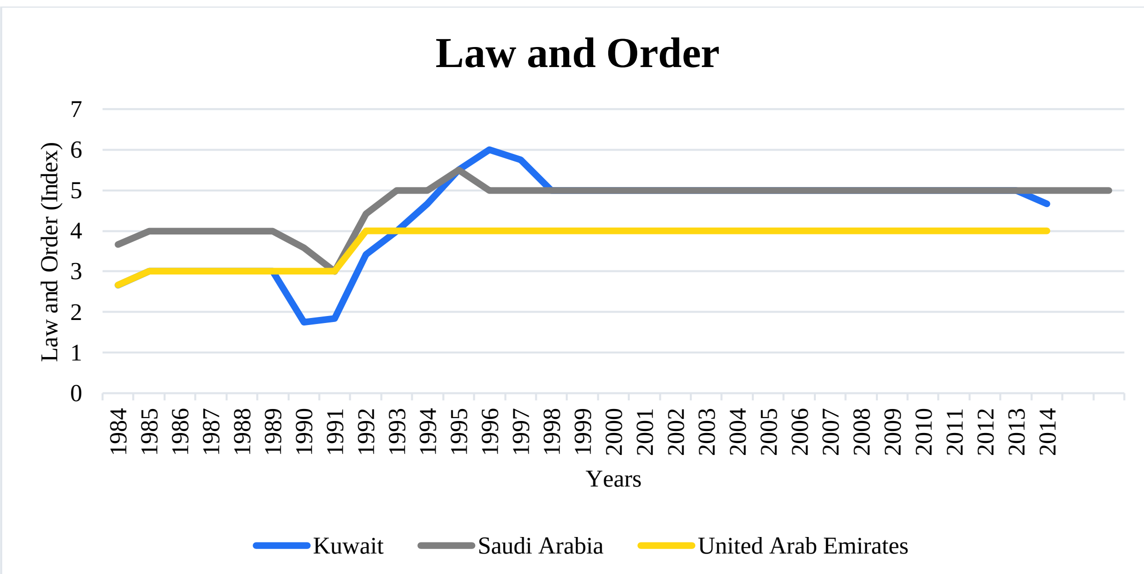



**Figure 3.4.** Law and Order.
Source: Author, based upon data taken from the ICRG (2017).

Human capital (HC) in the form of education introduces awareness and creativity in society, which discourages corruption and increases the quality of the institutions (Psacharopoulos, 1994; Lau, et al., 1991). Thus, this study included the human capital index (following Kim and Lin, 2017) to test the effect of education on institutional quality. The human capital index is the average years of schooling and rates of return for completing different sets of years of education, and the data were obtained from the Penn World Table (PWT) (Feenstra et al., 2015). The human capital index was the highest in the UAE, followed by the KSA and then KWT, which had lowest level (Figure 3.5).

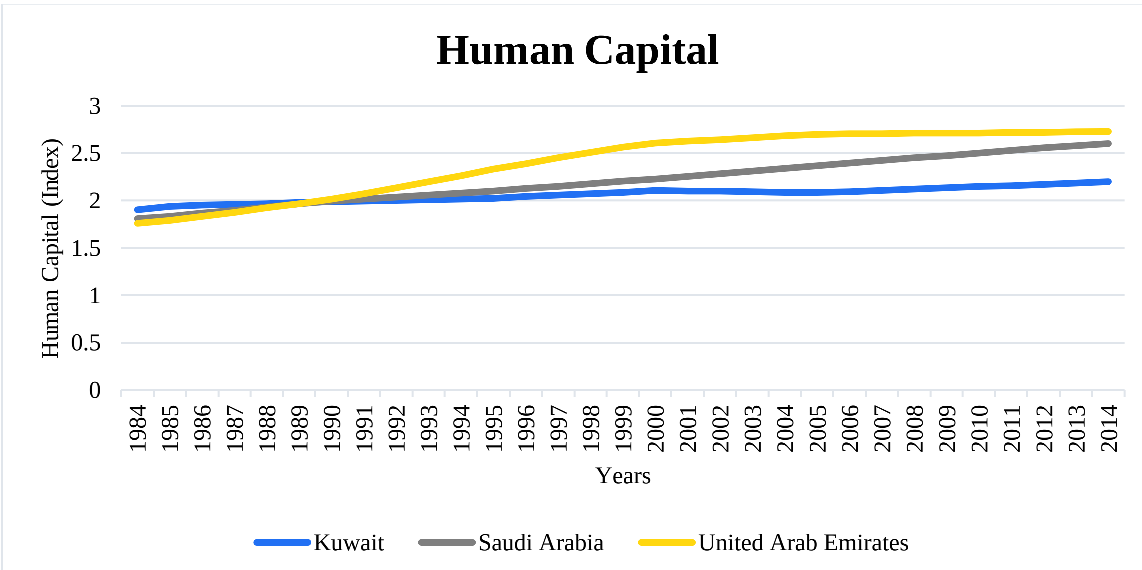



**Figure 3.5.** Human Capital Index.
Source: Author, based upon data taken from the Penn World Table (Feenstra et al., 2015).

The model used resource rents (RR) as an independent variable in this study to check the effect of non-renewable natural resources on institutional quality. RR is the value of interest and the natural logarithm was taken for this variable. The total natural resource rents is defined as the total % of GDP associated with the sales of natural resources, oil, natural gas, coal (hard and soft), forest rents, and mineral rents as obtained from the World Development Indicators (WDI) (World Bank, 2017). Hereafter, when resource rents are mentioned, we refer to the resource rents as a proportion of GDP. This proxy has been commonly used in several studies (Okada and Samreth, 2017; Elbadawi and Soto, 2015; Farhadi et al., 2015; Bhattacharyya and Hodler, 2014; Anthonsen et al., 2012) and is considered as a proxy of natural resource dependence in Shahbaz et al. (2019) and Bah (2016). Apparently, KWT had the highest share of resource rents (% of GDP), followed by the KSA, with the UAE displaying the lowest share (Figure 3.6).

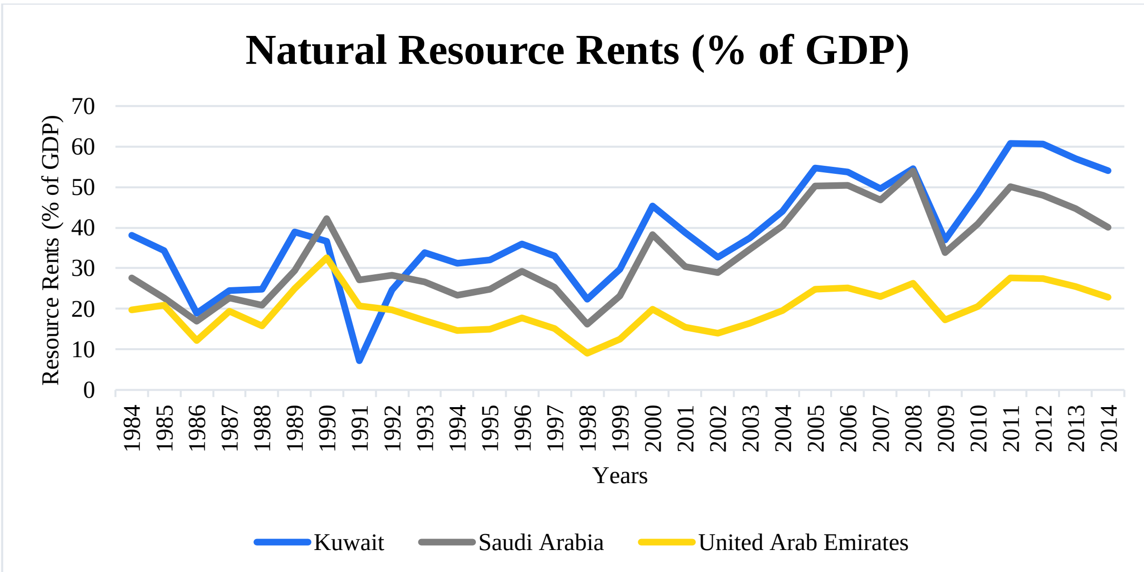



**Figure 3.6.** Natural Resource Rents (% of GDP).
Source: Author, based upon data taken from World Bank (2017).

## 3.4 Results and Discussion

### 3.4.1 Unit Root Test

As a first step and to justify the methodology, the order of the integration of variables needs to be checked as a precondition for any cointegration technique. For this purpose, the augmented Dickey Fuller and Phillips–Perron unit root tests were applied (Appendix B., Table B3). The results of the unit root tests remained the same as those reported in Table (2.1) for all countries. The results of both tests revealed that the variables followed different orders of integration; the dependent variable was stationary at the first difference and the resource rents were shown to be at a stationary level.

### 3.4.2 The ARDL and Bound Test

All variables in empirical Equation (3.2) followed different orders of integration, i.e. I(1) and I(0) in all countries, and the dependent variable was integrated to the order of one. These two characteristics of variables are important prerequisites when applying the ARDL. The other prerequisite for ARDL is the existence of cointegration between the I(0) and I(1) variables. This can be done by a cointegration bound test (Pesaran et al., 2001), which is based on the Wald test (F-test). The bound test results (Table 3.1) for KWT showed that the value of the F-statistics was higher than the upper bound at the 90% confidence interval and equaled 3.88 for institutional quality. From the obtained results, it can be assumed that for all equations, there is at least one short- or long-run cointegration relationship between the I(0) and I(1) variables.

The results for the KSA and the UAE are given in Table (3.1), which shows that all F-statistic values of were significant at the 95% confidence interval in both countries. The F-statistics value for institutional quality was 6.9 in the KSA and 11.1 in the UAE. These results confirm the long- and short-run cointegration. Since all preconditions to apply the ARDL have been fulfilled, we then proceeded with the next step toward the regression results.

**Table 3.1 Co-integration Bound Test Results.**

| **Country** | **Kuwait** | | **The Kingdom of Saudi Arabia** | | **The United Arab Emirates** | |
|---|---|---|---|---|---|---|
| **Dependent Variable** | **F- Statistics** | **K** | **F- Statistics** | **K** | **F- Statistics** | **K** |
| **Institutional Quality** | 3.88 | 3 | 6.90 | 4 | 11.10 | 4 |

### 3.4.3 Short-Run and Long-Run Results of the impacts of Natural Resources on Institutional Quality in Kuwait, the Kingdom of Saudi Arabia, and the United Arab Emirates

As the study aimed to examine the effect of resource rents as a proportion of GDP (RR) on institutional quality as proxied by corruption (CRP), the model was estimated by selecting corruption (CRP) as the dependent variable, and resource rents (RR) as the independent variable. Human capital (HC), law and order (LO), and per capita GDP (PGDP) were taken as the control variables along with resource rents. This was a necessary step to avoid the problem of omitted variables, which occurs when important variables are excluded from the model, hence avoiding biases and achieving robust results (Leightner and Inoue, 2012). The results of the short-run and long-run analysis based on ARDL are given in Table (3.2), and the lag lengths of the dependent and independent variables were selected on the basis of the Akaike Information Criterion (AIC).

| Table 3.2 Impact of Resource Rents and Human Capital on Institutional Quality in Kuwait, the Kingdom of Saudi Arabia, and the United Arab Emirates. | | | | | | |
|---|---|---|---|---|---|---|
| **Short-run results** | | | | | | |
| **Country** | **Kuwait** | | **The Kingdom of Saudi Arabia** | | **The United Arab Emirates** | |
| **Variable** | **Coefficient** | **t-Statistics** | **Coefficient** | **t-Statistics** | **Coefficient** | **t-Statistics** |
| **Corruption (-1)** | | | 0.292** | 2.160 | | |
| **Resource Rents** | 0.428* | 1.874 | 0.104** | 2.165 | 0.233* | 1.783 |
| **Resource Rents (-1)** | | | −0.074 | −1.556 | | |
| **Human Capital** | −0.655* | −1.871 | −0.164 | −1.535 | −0.203 | −0.822 |
| **Law and Order** | | | −0.076** | −2.221 | 0.770*** | 4.755 |
| **Per capita GDP** | 0.100 | 0.297 | −0.503 | −1.635 | 0.359 | 0.749 |
| **Per capita GDP (-1)** | | | 0.432* | 1.871 | | |
| **Per capita GDP (-2)** | | | −0.560*** | −2.833 | | |
| **CointEq (-1)** | −0.266* | −2.011 | −0.534*** | −4.869 | −0.438*** | −4.507 |
| **Long-run results** | | | | | | |
| **Variable** | **Coefficient** | **t-Statistics** | **Coefficient** | **t-Statistics** | **Coefficient** | **t-Statistics** |
| **Resource Rents** | 0.430* | 1.968 | 0.096 | 0.622 | 0.533 | 1.538 |
| **Human Capital** | −0.675*** | −3.150 | −0.034 | −0.590 | −0.463* | −1.855 |
| **Law and Order** | | | −0.143** | −2.701 | 0.756*** | 3.949 |
| **Per capita GDP** | 0.648 | 0.466 | 0.611 | 1.089 | 3.338*** | 6.368 |
| C | 12.999*** | 5.404 | −4.95 | −0.905 | −46.06*** | −6.720 |

Note: ***, **, and * denote the significance at the 99%, 95%, and 90% confidence interval respectively.
Note: In this study, the variable of law and order in the case of KWT was excluded due to the problem of multicollinearity between law and order and resource rents.

### 3.4.3.1 Results in Kuwait

It appears that resource rents (as a proportion of GDP) could induce corruption and cause a deterioration in the institutional quality in both the short- and long-run. With a 1% increase in the proportion of resource rents in the GDP of KWT, corruption increased by 0.42% and 0.43% in the short-run and long-run, respectively, which was significant at the 10% level. Human capital also had a noticeable impact on institutional quality in both the short- and long-run. Human capital reduced corruption by 0.66% in the short-run and 0.68% in the long-run per a 1% increase in human capital. However, there was no statistically significant link between PGDP and institutional quality in the short- and long-run. A perspective of the data and results is presented in Appendix C. (Figure C7, Section 3.1).

The model was judged to be stable with a 0.26 error correction term. Next, the cumulative sum control chart (CUSUM) and CUSUM of squares tests were applied to check the stability of the model, where both tests indicated that the model was stable (Appendix D., Figures D13 and D14).

#### 3.4.3.2 Results in the Kingdom of Saudi Arabia

The results showed that resource rents had no impact on institutional quality in the long-run, but rents induced corruption and damaged institutional quality in the short-run. Resource rents (% of GDP) negatively impacted institutional quality by 0.10%, relative to a 1% increase in the proportion of resource rents in the GDP of the KSA.

The results also revealed that corruption in a one-year lag form worsened institutional quality and increased corruption in the short-run by 0.29% relative to a 1% increase in a one-year lag of corruption. Moreover, a 1% increase in the one-year lag of PGDP in the KSA increased corruption by 0.43% in the short-run, but the 1% increase in the two-year lag of PGDP reduced corruption by 0.56% in the short-run. Furthermore, law and order; as an independent variable in this case, was found to be statistically significant at the 10% level in both the short- and long-run, so a 1% increase in law and order decreased corruption by 0.07% and 0.14%, respectively.

However, it appeared that there was no statistically significant link between PGDP and corruption in both the short- and long-run, or between human capital and corruption in the

KSA. Additional analysis of the data and results in KSA is presented in Appendix C. (Figure C8, Section 3.2).

The error correction term value of negative 0.53 indicated that the model was stable. A further check of the stability of the model was required, hence the CUSUM and CUSUM of squares tests were applied and both tests proved the stability of the model (Appendix D., Figures D15 and D16).

#### 3.4.3.3 Results in the United Arab Emirates

In the UAE, the results showed that resource rents had a positive impact on corruption in the short-run by 0.23% per 1% increase in resource rents (as a proportion of GDP) at the 10% significance level. Law and order, as a measure of institutional quality, was positively and significantly correlated with corruption at the 1% significant level. A 1% increase in law and order increased corruption in both the short- and long-run in the UAE by 0.77% and 0.76%, respectively. Regarding human capital, a 1% improvement in the human capital index decreased corruption by 0.46% in the UAE in the long-run with a 90% confidence level. Additionally, a 1% increase in the PGDP increased corruption by 3.33% in the long-run at the 99% confidence level. Further assessment of the results of the UAE during the period under study is given in Appendix C. (Figure C9, Section 3.3).

The error correction term was significant at the 1% level with a negative value of 0.43, hence, it asserts that 43% of errors was corrected successively every year, and that the model was stable. Furthermore, the CUSUM and CUSUM of squares tests were applied to check the stability of the model, and both tests supported the stability of the model (Appendix D., Figures D17 and D18).

### 3.4.4 Overall Discussion

As revealed from the previous section, the results varied as each country had its own experience, settings, and features that could change the way its economy reacted to changes in the independent variable. This section discusses the different results of the impact of natural resources, human capital, and PGDP on institutional quality in the three countries under examination, then links the results to the literature to understand and analyze the situation in each country.

#### 3.4.4.1 Natural Resource Rents

There was a negative association between resource rents and institutional quality in the KSA, the UAE, and KWT, which is known as the 'political resource curse', where resource rich countries are more prone to inadequate governance, corruption, and rent-seeking behavior, thus causing a distortion in the allocation of resources and a decrease in economic efficiency (Olayungbo and Adediran, 2017; Okada and Samreth, 2017; Ross, 2015; Akpan and Chuku, 2014; Oskenbayev et al., 2013; Williams, 2011; Murshed, 2007; Mehlum et al., 2006; Torvik, 2002; Gylfason, 2001).

One possible clarification for the negative association is that the huge windfalls from natural resources encourage politicians to use these windfalls for their own personal benefit as long as they remain in their positions, which is similar to the findings of Ahmadov et al. (2013), Busse and Groening (2013), and Kolstad and Soreide (2009).

In addition, the positive relationship between resource rents and corruption persisted in the long-run in KWT. The possibilities of this finding, particularly in the case of KWT, can be related to the findings of Montinola and Jackman (2002), who found that the semi-democratic political system paved the way for corruption and poor checks and balances (Collier and Hoeffler, 2009). Another possibility is that when the political system is divided between an appointed government and elected parliament, the country becomes less accountable and less representative, providing more loopholes for rent-seeking activities and the misallocation of natural resources (Andersen and Aslaksen, 2008).

Our findings across the three countries were consistent with several studies such as Antonakakis et al. (2017), Olayungbo and Adediran (2017), Okada and Samreth (2017), Apergis and Payne (2014), Dias and Tebaldi (2012), Anthonsen et al. (2012), Easterly and Levine (2003), and Ades and Di Tella (1999).

#### 3.4.4.2 Institutional Quality (Law and Order)

Finding a positive relationship between corruption and law and order in the UAE was unusual and have only been found in a few analyses such as by Nye (1967) and Rose-Ackerman (1978) as this relationship has been found to be negative in most studies (Wolfowitz, 2006; Herzfeld and Weiss, 2003; Knack and Keefer, 1995). One possible cause is that high law and order explains institutional reforms that are designed to combat administrative corruption (Gould, 1991) and suppress the general public. This is achieved by improving accountability and transparency, but institutional reforms do not tackle grand corruption, which is the corruption that exists among the political and economic elites (Hellman et al., 2000). Hence, grand corruption persisted from 1992 to 2007 as seen in Figure (3.2). It is likely that common approaches to reduce corruption and build law and order are non-overlapping as corruption is always tackled across all branches of government, whereas law and order programs focus on a narrow set of public actors in the security domain (Fox, 2000). However, further investigation is needed regarding this situation.

The model selected a positive effect of a one-year lag of corruption on the institutional quality in the KSA in the short-run. Thus, if a country suffers from a high level of corruption in the past, then it is more likely to have high levels of corruption in the following years or in the future, as officials might substitute between the different forms of corruption with time and might learn to manipulate the rules (Burgess et al., 2012; Olken, 2007).

The finding of a negative relationship of ‘law and order’ and corruption in the KSA in both the short-run and long-run is compatible with other studies that have confirmed how the efficiency of the judicial system, which maintains law and order, helps in reducing corruption (Ubi and Udah, 2014; Attila, 2008; Seldadyo and de Haan, 2006).

#### 3.4.4.3 Human Capital

Although the KSA showed insignificant results regarding human capital and corruption, KWT and the UAE showed a negative relationship between human capital and corruption in the long-run as well as in the short-run only in the case of KWT. In the UAE and KWT, the result of the negative effect of human capital on corruption showed, on a balance of probability, that education encourages anti-corruption awareness, behaviors, and information, and increases the tendency of people participating in good citizenship, as found by Faria et al. (2016), Tebaldi and Elmslie (2013), Dias and Tebaldi (2012), Coe et al. (2009), Oreopoulos and Salvanes (2009), Cheung and Chan (2008), Lederman et al. (2005), Beets (2005), and Glaeser et al. (2004).

However, the lack of a relationship between human capital and corruption in the KSA contradicts several studies that believe that human capital reduces the tolerance to observe and participate in corruption (Faria et al., 2016; Dias and Tebaldi, 2012). One of the main reasons why our study had results that were inconsistent with the bulk of the literature is that most of the past studies have been cross-sectional and panel data studies that treated all of the countries as a group. These results cannot be used to present the effects in an individual country, because there is a chance of hiding or skipping some important information related to the country due to the differences in their characteristics (Brockwell and Davis, 2002; Ades and Di Tella, 1999). In contrast, this study tackled each country independently by using a time series data, where the empirical model was estimated for each Gulf country with its own characteristic properties.

#### 3.4.4.4 Per Capita GDP

The lack of a relationship between PGDP and corruption in the KSA in the long-run matched the results seen in KWT, and also aligned with Busse and Groening (2013). One possible cause for this finding is that while citizens are enjoying higher incomes from the huge revenues due to natural resource wealth (Driouchi, 2014), the governments are lagging behind due to corruption practices. This was observed in the KSA where they had the lowest levels of institutional quality (Figure 3.2), and accordingly, these revenues were not found to be related to how good the quality of the institutions were, concluding that KWT and the KSA lagged behind in the efficient transfer of revenue into development and growth (Banafea and Ibnrubbian, 2018; El-Katiri et al., 2011). Another possible cause is that if a country is blessed with huge resource revenues, the impression of a false sense of security exists, leading governments to pay little attention to the necessity of delivering good institutional quality. However, this can be detected in any resource rich country because it is a common condition under the phenomenon of the resource curse (Busse and Groening, 2013; Gylsafon, 2001; Sachs and Warner, 1999). Another possibility is that when the citizens do not pay taxes, as in the case of KWT and the KSA, they do not see themselves as entitled to supervise how these revenues are allocated or used by the government. Moreover, the governments themselves are not held accountable in how they allocate these revenues efficiently in front of its citizens, or how good the quality of institutions is in these countries (Besley and Persson, 2014; Moss, 2010; Sandbu, 2006).

In the case of the UAE, the positive relationship between PGDP and corruption in the long-run, and the one-year lag of PGDP in the KSA has been explained in previous studies by high levels of national income that could feed corruption, which generates inefficient economic policies, and that the level of corruption varies according to the level of income, so our finding was in accordance with that of Seldadyo and de Haan (2006), Frechette (2006), and Braun and Di Tella (2004). However, the negative relationship of the two-year lag of PGDP and corruption in the KSA in the short-run reflects the common rule that institutions tend to be relatively strong in high-income countries. Thus, the higher the PGDP, the higher the demand for better institutional quality and transparency (Serra, 2006; Treisman, 2000). Furthermore, high-income countries have the financial resources to fight corruption and improve government regulations (Busse and Groening, 2013).

## 3.5 Conclusion

The impact of natural resource dependency on institutional quality, which is known as the political aspect of the resource curse, was examined in Gulf Countries by taking institutional quality as the dependent variable. The study obtained a time series database over the period 1984–2014 and followed the ARDL model and cointegration technique. The results revealed that in the long-run, resource rents as a proportion of GDP had a detrimental effect on the ratings of institutional quality in KWT, though, this was statistically insignificant in the long-run in the case of the KSA and the UAE, indicating that rents from natural resources are not affecting institutional quality. Notwithstanding, the negative and significant effect of the proportion of resource rents in the GDP of KWT on institutional quality is due to its greater dependency on resource rents in comparison to the other two countries. Furthermore, KWT is a small country with a monarchy and political elite who desire to keep a strong hold on the oil revenues (Ehteshami and Wright, 2007).

Human capital in the form of education can mitigate the resource curse since it increases the level of institutional quality (low corruption) in the short- and long-run in the case of KWT and the UAE. This can be clarified as education encouraging anti-corruption awareness and information, hence improving the institutional quality. Accordingly, there is a need to enhance the level of education in these countries, but the optimal level of education to attain was out of the scope of this study.

Currently, rents from natural resource wealth are beneficial for Gulf Countries since these rents boost investments, employment, and capital accumulation as well as increase the PGDP (Driouchi, 2014). Nevertheless, poor institutional quality could turn this blessing into a curse. Thus, it is recommended that if these countries desire the full benefits from oil rents, serious effort and decisiveness should be devoted to reform and revamp the institutions along with democratic reforms. Moreover, there is a need to ensure an optimal management of natural resources through strong institutions to achieve long-term growth and sustainable development. The ideal institutions and policies required to guarantee the optimal management of natural resources in a way that fits the countries' goals are the scope for further research.

It is worth recalling that there is no current consent in the literature over the link between natural resources and institutions and many have suggested that the link is distinctive for each country (Brunnschweiler and Bulte, 2008; Bulte et al., 2005). This paper has added to this body of work by examining the particular circumstances and conditions of KWT, the KSA, and the UAE individually.

# 4

# THE SHORT- AND LONG-TERM IMPACTS OF NATURAL RESOURCES ON HUMAN CAPITAL DEVELOPMENT IN GULF COUNTRIES

## 4.1 Introduction

Over time, natural resources have both been considered as either an engine of growth or an obstacle to growth in different contexts (Bravo-Ortega and Gregorio, 2005). The former idea has been termed the “resource curse” and has been the subject of a substantial number of studies (Badeeb et al., 2017; Frankel, 2012; Van der Ploeg, 2011).

Much work has been devoted to understanding the underlying factors responsible for the varied experiences of resource-rich countries and the mechanisms through which resource endowments can either enhance or impede economic growth (Poelhekke and Van der Ploeg, 2017; Venables, 2016; Gilberthorpe and Papyrakis, 2015).

However, there is no universally accepted theory of the resource curse. Most explanations of the resource curse are based on crowding-out logic, which was simplified by Sachs and Warner (2001) to the statement that natural resources tend to crowd out certain growth-enhancing activities. Past studies have emphasized that the mere existence of natural resources does not prompt economic stagnation, yet, the distortions that they cause act as transmission mechanisms which, in turn, perturb economic growth (Sun et al., 2019; Shao and Yang, 2014; Blanco and Grier, 2012; Daniele, 2011; Stijns, 2006; Gylfason, 2001). The majority of studies in this area have focused on the monetary impacts of the resource curse, in terms of the rate of economic growth and level of per capita GDP (Moradbeigi and Law, 2017; Ahmed et al., 2016; Arezki and Van der Ploeg, 2011; Rodriguez and Sachs,1999), which was tackled in the first chapter. However, recent interest has been focused on its non-monetary impacts; mainly, human capital (Cockx and Francken, 2016; Faria et al., 2016; Shao and Yang, 2014; Cockx and Francken, 2014; Kurtz and Brooks, 2011; Butkiewicz and Yanikkaya, 2010; Behbudi et al., 2010).

Human capital represents the skills, education, working experience, and knowledge that individuals build, maintain, and practice (Alan at al., 2008; Armstrong, 2006; Romer, 1990). Human capital is a necessary element for rapid economic growth and development across the globe, because it improves living standards by increasing workforce productivity and, hence, wages, which fosters democracy, creates good governance, and enhances equality (Hanushek and Woessmann, 2007; Sala-i-Martin et al., 2004; Sianesi and Van Reenen, 2003; Krueger and Lindahl, 2001; Aghion et al., 1999; Barro, 1997; Romer, 1986).

There has been an upsurge of interest regarding the relationships between natural resources and human capital; especially in tracing the negative link between resource wealth and economic growth to deteriorating human capital in resource-rich countries (Cockx and Francken, 2016; Faria et al., 2016; Shao and Yang, 2014; Bravo-Ortega and De Gregorio, 2005; Birdsall et al., 2001b). There is a principal argument that explains how rents from natural resources, as measured by income from oil, gas, and minerals, tend to reduce human capital. This argument is related to the false sense of security and overconfidence that natural resource rents bestow on governments and societies (Behbudi et al., 2010; Sachs and Warner, 1999). Consequently, this reduces incentives to invest in human capital and causes individuals to become locked into low skilled jobs and, consequently, low growth. According to Gyfalson (2001), countries which consider their natural resources as their most relevant asset are prone to neglect human capital development by allocating low attention and financial resources to it.

Besides these conclusions, which have specifically considered the impact of natural resources on human capital, the literature has paid relatively little attention to whether other important factors, such as institutional quality and per capita GDP, could have any impact on human capital in a resource-rich economy. For example, in Norway, with its natural resources and highest level of human capital in the world (The Global Human Capital Report, 2017), one could question institutional roles in the development of its human capital.

Based on this argument, this study seeks to understand whether institutional quality has any link to human capital as a clarifying step towards a full picture of the relationships that may exist among human capital and institutional quality. It has been observed that good institutional quality is essential in supporting human capital development (Hanushek and Woessmann, 2007), as enhancement in human capital may not necessarily be linked to major improvements in growth if weak institutional quality exists (Faruq and Taylor, 2011). Though the literature lacks studies that examine the presence of relationships between institutional quality and human capital, especially in resource-rich economies, a few studies have examined this scenario by looking at the links between natural resources and human development by, directly or indirectly, considering institutional quality (Carmignani and Avom, 2010; Costantini and Monni, 2008; Bulte et al., 2005; Barro, 1991).

The objectives of this study are based on several factors. First, it has been put forward that human capital is essential for growth, as agreed by several studies (Pelinescu, 2015; Temple, 1999; Romer, 1990). Second, the number of studies in this field is limited. Finally, the resource curse has different ‘strains’, according to national circumstances. Therefore, this study aims to contribute to the development theory by testing whether there is evidence for the resource curse for human capital, along with per capita GDP and institutional quality as control variables, in a number of the major petroleum-exporting countries: Kuwait (KWT), the Kingdom of Saudi Arabia (KSA), and the United Arab Emirates (UAE); which, to date, have not received attention in the literature.

To our knowledge, this is the first study to attempt this type of analysis on the Gulf Countries (GCs). This is interesting for an international audience as GCs are dependent on natural resources; thereby, making GCs prime candidates for the adverse effects of the resource curse (see Appendix A.). Moreover, GCs have a strong influence in The Organization of the Petroleum Exporting Countries (OPEC) and, as such, such a study provides useful results to policymakers.

This study is organized as follows: Section 4.2 includes a review of the relevant literature regarding human capital, natural resources, institutional quality, and growth. Section 4.3 provides the methodology and empirical evidence about the topic. The results and discussion are given in Section 4.4. Finally, we conclude with Section 4.5.

## 4.2 Literature Review

Despite the resource curse literature primarily focusing on the detrimental effects of resource abundance on economic growth rates, evidence has also been provided that resource-rich countries tend to perform relatively poorly against measurements closely linked to growth performance, such as life expectancy, child mortality, and human capital development (Shao and Yang, 2014; Blanco and Grier, 2012; Papyrakis and Gerlagh, 2007; Stijns, 2006; Bulte et al., 2005; Gylfason, 2001; Ross, 2001). These studies concluded that natural resource dependence (Shao and Yang, 2014; Blanco and Grier, 2012; Papyrakis and Gerlagh, 2007; Gylfason, 2001) and natural resource abundance (Stijns, 2006; Bulte et al., 2005) are negatively correlated to the factors that determine economic growth. Gylfason et al. (1999) argued that the mere availability of natural resources does not affect the economy but, instead, affects transitory mechanisms, such as declining productivity, high corruption, and deteriorating human capital, which, in turn, affect economic growth (Welsch, 2008; Papyrakis and Gerlagh, 2004; Gyfalson, 2001).

In fact, some studies have found that natural resource richness has a negative impact on social outcomes in general, supporting the view that human capital serves as a transmission channel for the resource curse (Cockx and Francken, 2016; Shao and Yang, 2014; Carmignani, 2013; Blanco and Grier, 2012; Carmignani and Avom, 2010; Sarr and Wick, 2010; Gylfason, 2008; Welsch, 2008; Kronenberg, 2004).

Natural resources are considered to be harmful to human capital due to a number of risks. One risk associated with natural resource abundance is that too many workers become locked into low-skill, natural resource-based industries, such as mining, and so fail to advance their own skills, education, or earnings. Cockx and Francken (2014) and Butkiewicz and Yanikkaya (2010) proposed that resource-rich countries may invest less into the development of human capital, which impedes the development of non-resource sectors, resulting in lower productivity and lower overall growth rate.

Another risk is that the authorities and individuals in resource-rich countries become confident enough to under-rate the need for sound macro-economic management and human capital development after benefiting from huge natural resource revenues (Gyfalson, 2001). In other words, natural resource abundance dampens the need for human capital development due to a false sense of security, which reduces public and private incentives to save and invest (Welsch, 2008; Papyrakis and Gerlagh, 2004) and causes countries to assign inadequate attention and expenditure to human capital (Behbudi et al., 2010; Birdsall et al., 2001b), as well as causing countries to reduce investment in public capital (Bhattacharyya and Collier, 2014).

In particular, human capital has received increasing attention in the literature. Human Capital is the skills and knowledge that individuals build, maintain, and practice (Alan at al., 2008; Armstrong, 2006; Garavan et al., 2001; Romer, 1990). Rodriguez and Loomis (2007) defined human capital as 'the knowledge, skills, competencies and attributes in individuals that facilitate the creation of personal, social and economic well-being'.

Human capital theory (Mincer, 1974; Ben-Porath, 1967; Becker,1964) explains how education is a significant source of human capital and is a crucial factor in the growth of any country (Acevedo, 2008). Thus, education is considered as the predominant means for measuring human capital (Sun et al., 2018; Alan at al., 2008). There has been an increasing consensus on how human capital, in the form of education, is important for sustainable economic growth and, in turn, education has been considered as a major component of human capital (Webb et al., 2018; Fitzsimons, 2017; Bassanini and Scarpetta, 2002). Most of these studies have found that the quantity of education—as measured by educational attainment and average number of years of schooling—positively affects economic performance (Sala-i-Martin et al., 2004; Sianesi and Van Reenen, 2003; Krueger and Lindahl, 2001; Temple, 2001). Likewise, the quality of education—as measured by international test scores—positively affects economic outcomes (Hanushek and Woessmann, 2007).

From a theoretical standpoint, it is expected that human capital development does have an impact on growth; however, from an empirical standpoint, human capital is not a guarantee for achieving long-run economic growth. In the endogenous growth literature (Lucas, 1998; Aghion and Howitt, 1992; Romer, 1990), human capital is considered as another factor of production and, therefore, investment in human capital is similar to investment in any other production input (e.g., physical capital). Blankenau et al. (2007) and Bose et al. (2007) concluded that spending on human capital is significantly correlated with economic growth in both developing and developed countries. Although the current level of human capital positively affects income per capita, this effect is insignificant for the growth of human capital (Benhabib and Spiegel, 1994). Additionally, Cohen and Soto (2007) found that economic growth has a positive relationship with the level of human capital.

Human capital is essential in alleviating poverty and is a driver of sustainable growth (Hanushek and Woessmann, 2007; Cohen and Soto, 2007; Jung and Thorbecke, 2003; Krueger and Lindahl, 2001; Barro, 2001). Additionally, there are clear linkages between inequality, poverty reduction, and human capital, in form of education (Abdullah et al., 2015; Gregorio and Lee, 2002). Furthermore, human capital, in form of education, has been found to positively impact healthy behavior and outcomes (Conti et al., 2010). Becker (1964) and Schultz (1961) suggested that human capital, in form of education, enhances skills which, in turn, boosts labor productivity. Another important factor which enhances the productivity of an economy is the availability of public support for research and development, learning, and training in a stable macro-economic environment, which has been shown to be essential in promoting productivity (Sharpe, 1998).

Human capital has been found to be a critical variable in the determination path of the wealth of nations (Manuelli and Seshadri, 2014). A large portion of cross-country output divergences are due to the differences in the quality of human capital; however, this is not uniform across different development levels (Manuelli and Seshadri, 2014). Some studies have been conducted in different resource-rich countries (Sun et al., 2019; Akpan and Chuku, 2014), which shared the same basic viewpoint that investment in human capital does not deliver the expected earnings and outcomes (Filmer et al., 2017); consequently, the public desire for education declines, causing a deficit in the driving force of the accumulation of human capital. For example, Blanco and Grier (2012) found that, when natural resource dependence is disaggregated into sub-categories, petroleum export dependence shows a positive effect on physical capital and a negative effect on human capital, and that this effect held in the long-run for 17 Latin American countries. Papyrakis and Gerlagh (2007) found that natural resource abundance in the U.S. decreased human capital investments. Another empirical analysis by Sun et al. (2018) of provincial panel data from China identified a crowding-out effect of natural resource dependence on human capital accumulation in the western and central regions of China. The same results were achieved by Douangngeune et al. (2005) in Japan, South Korea, and Thailand; by Birdsall et al. (2001) in South Korea and

Brazil; and by Wang et al. (2009) in China. While the implications of vast natural resource endowments have been examined through their effects on primary outcomes, such as human capital, in many different countries, it is clear that the literature lacks studies on the Gulf region. For this reason, it is important to examine the effects in GCs to gain a complete perception of the impact of natural resource wealth on human capital.

Institutional quality is an important factor to consider when studying human capital, as the desired outcome of human capital on growth is noticeable if these skills and knowledge are applied in a stable and strong institutional and political environment (Faruq and Taylor, 2011). Therefore, it is essential to examine the effects of institutional quality on human capital, because human capital is a key driver of economic growth and development.

Some scholars have tackled the link between human capital and institutions (Tebaldi and Elmslie, 2013; Dias and Tebaldi, 2012; Coe et al., 2009; Castello-Climent, 2008; Hanushek and Woessmann, 2007; Glaeser et al., 2004; Engerman and Sokoloff, 2002). These studies found that countries with strong institutional qualities, such as protection of property rights, control of corruption, market-friendly policies, and effective judiciary systems, experience higher rates of innovation (Tebaldi and Elmslie, 2013), higher school-enrollment rates (Barro, 1991), higher research and development investments and human capital formation (Coe et al., 2009; Glaeser et al., 2004; Gwartney et al., 2004), and higher productivity (Justesen, 2008; De Haan and Sturm, 2000). Additionally, Faria et al. (2016) found no direct impact between human capital and development; yet, this impact was clear through economic institutions.

In the case of resource-rich countries, some scholars have observed that resource abundance lowers human capital development through its effect on institutional quality (Akpan and

Chuku, 2014; Costantini and Monni, 2008; Bulte et al., 2005). Torvik (2002) developed a new mechanism to explain why resources may decrease welfare and income by combining rent-seeking and increasing returns to scale to capture the idea that more resources might lower social welfare. Cabrales and Hauk (2011) showed that human capital depends negatively on natural resources in the presence of poor political institutions, whereas, for a high quality of institutions, this dependence is inverted. Another study by Rodriguez and Sachs (1999) showed that windfalls from natural resources may tempt officials into corruption and rent-seeking, rather than pro-growth activities of investment in health and education. In his empirical analysis, Daniele (2011) showed how resource abundance is linked to lower human development; however, he related this negative link to the lack of effective management of resources and not to the resources themselves. He emphasized that the impacts of natural resources on economic and human development can be very diverse and are strictly related to certain institutional and national political characteristics in cases like the Democratic Republic of Congo, Equatorial Guinea, and Botswana. It has been verified empirically that human capital is associated positively to per capita GDP, but this is conditional on the presence of high-quality institutions and economic opportunities (Ali et al., 2018).

Finally, resource-rich countries that have effectively escaped the resource curse tend to have higher levels of human capital (Bravo-Ortega and de Gregorio, 2005), as higher educational levels help in the management of these resources in efficient ways which support technology absorption and encourage the development of productive economic sectors (Kurtz and Brooks, 2011; Stijns, 2006). Suslova and Volchkova (2012) recommended setting educational policies directed at generating a skilled labor force, which is crucial to guarantee sustainable economic development in resource-rich nations. Moreover, high levels of human capital have been found to offset the negative effects of natural resource dependence (Aljarallah and Angus, 2019; Behbudi et al., 2010; Bravo-Ortega and de Gregorio, 2005). As shown by Shao and Yang (2014), the efficient allocation of factors of production plays a critical role in whether natural resources are a blessing or a curse—thus, sufficient human capital is crucial to evade the curse.

Nonetheless, a handful of studies have presented evidence counter to the negative relationship between natural resources and human capital. For example, in a panel study by Stijns (2006) to find the link between natural resource abundance and human capital accumulation, the results showed that resource rents are significantly correlated with improved indicators of human capital accumulation and investments in human capital. Stijns (2006) argued that previous empirical results pointing out a curse between both variables might suffer from specification errors due to the selection of non-accurate indicators of natural resource abundance. Furthermore, Cotet and Tsui (2013) found that dependence on minerals improves health and education; however, Kim and Lin (2017) and Cockx and Francken (2016) claimed that dependence on natural resources improves education but deteriorates health. Daniele (2011) concluded that human development is positively affected by resource abundance but negatively affected by resource dependence. Another study that presented similar results was Davis (1995), which found that 22 resource-rich countries compared favorably to resource-poor countries, in terms of per capita GDP and different human development indicators. Davis concluded that the indicators of human capital accumulation are higher in resource-rich countries. Tsui (2010) and Ross (2001) proposed that resource-rich countries show good potential to benefit from their resource revenues, in regard to human capital, due to some advantages. First, resource-rich countries can escape from dead-weight costs linked to taxation and, accordingly, they are capable of offering public goods at a low social cost. Additionally, they have strong motivation to increase social expenditure in exchange for social peace and public support. Furthermore, natural resources can permanently boost welfare and income through higher levels of human capital (Bravo-Ortega and de Gregorio, 2005).

The actual monetary and non-monetary impacts of the resource curse will vary, according to the particular circumstances of a country, as suggested by Torvik (2009). Accordingly, this study investigates the impact of natural resources on human capital, along with per capita GDP, corruption, and law and order as control variables, in one of the major petroleum exporting countries, which, to date, has not received attention in the literature. If the resource curse has different 'strains', according to national circumstances, then there is a need to understand if and how the resource curse presents itself in all settings. To the authors' knowledge, this is the first study to attempt this type of analysis on Gulf Countries. From a policy standpoint, it is essential for Gulf Countries to examine how their natural resources affect their human capital accumulation.

In particular, natural resource wealth is beneficial to Gulf Countries, with national income from their exports being associated with higher life expectancy, lower child mortality rates, higher electricity use per capita, higher income per capita, higher consumption levels, and better physical infrastructure than oil-poor countries (Hvidt, 2013; Sachs, 2007; Ross, 1999; Karl, 1997). The case in GC where jobs and wages are guaranteed in the public sector, which offers highly preferred conditions, from an individuals' perspective. Nevertheless, the public sector productivity is limited, which reduces the incentive to improve the level of education.

Additionally, jobs in the energy sector are accessible, which require less skills and qualifications with higher earnings (Gatti, et al. 2013), thereby making GCs prime candidates for the undesirable effects of the Resource Curse.

## 4.3 Research Methodology and Data

### 4.3.1 Theoretical Model

Rapid and sustained growth is unquestionably crucial for social development, but to attain sustainability in the long-run, growth should be inclusive to be distributed among all the sectors in the economy (De Mello and Dutz, 2012). Accordingly, to reveal whether resource rents growth is inclusive or exclusive, this study tests the impact of resource rents on human capital, along with other independent variables. Equation (4.1) indicates that human capital (HC) is a function of resource rents (RR), corruption (CRP), law and order (LO), and per capita GDP (PGDP):

$$HC = f\,(RR, CRP, LO, PGDP). \tag{4.1}$$

### 4.3.2 Empirical Model and Estimation Procedure

In this section, we empirically investigate the impact of resource rents, per capita GDP, and institutional quality on human capital. We can write equation (4.1) as follows

$$HC_t = \alpha_o + \theta_1 RR_t + \theta_2 Crp_t + \theta_3 LO_t + \theta_4 PGDP_t + \mu_t, \tag{4.2}$$

where $\alpha_o$ is the intercept, $\mu_t$ is the error term, and the subscript $t$ is used to indicate that the data is a time series.

#### 4.3.2.1 Autoregressive Distributed Lag Model

To derive the short- and long-run results, this study applies an Autoregressive Distributed Lag Model (ARDL). The General form of the ARDL model of equation (4.2) is as follows,

$$\begin{aligned}\Delta HC_t = \alpha_0 &+ \sum_{i=1}^{t} \delta_i \, \Delta HC_{t-i} + \sum_{i=1}^{t} \rho_i \Delta \, RR_{t-i} + \sum_{i=1}^{t} \omega_i \Delta \, Crp_{t-i} \\ &+ \sum_{i=1}^{t} \varphi_i \, \Delta LO_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta \, PGDP_{t-i} + \lambda_1 HC_{t-1} + \lambda_2 RR_{t-1} \\ &+ \lambda_3 CRP_{t-1} + \lambda_4 LO_{t-1} + \lambda_5 PGDP_{t-1} + \mu_t,\end{aligned} \quad (4.3)$$

where $\alpha_0$ is a constant and the terms $\delta_i$, $\rho_i, \emptyset_i, \omega_i$, and $\varphi_i$ are parameters used for short-run analysis, while $\lambda_1$, $\lambda_2$, $\lambda_3$, $\lambda_4$, and $\lambda_5$ are used for estimating the long-run parameters. The Wald restriction test is used to test the long-run relationship or co-integration between the dependent and the independent variables. The value of the F-test is taken by applying the coefficient diagnostic Wald restriction test on long-run variable parameters. The hypotheses for the co-integration test are

$H_0 = \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$ (indicating no co-integration), and

$H_1 = \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq 0$ (indicating co-integration).

The F-test is based on the number of regressors in the model. If the F-stat value is greater than the value of the upper bound, then the null hypothesis will be rejected, and we conclude that there is co-integration and that long-run relationships exist between the dependent and independent variables. If the value of the F-stat is lower than the value of the lower bound, then the null hypothesis is not rejected and we conclude that there is no co-integration, which means that there is no long-run relationship between the dependent and independent variables. Finally, if the F-stat is between the lower and upper bounds, then we conclude that the result is inconclusive.

The orders of the lag length in the ARDL model are selected by using the Akaike information criteria (AIC). If the co-integration is statistically significant, then the values of the long-run parameters are found by normalizing the long-run equation and estimating the error correction model for short-run analysis.

Under the assumption of steady-state condition, the long-run Equation is $\Delta HC_i = 0$, which means that

$$\Delta HC = HC_t - HC_{t-1} = 0 \Rightarrow HC_t = HC_{t-1}.$$

By applying the above assumption and dividing by $\lambda_1$, Equation (4.3) can be written in the long-run form as follows,

$$\frac{\lambda_1}{\lambda_1}HC_t = \frac{\lambda_2}{\lambda_1}RR_{t-1} + \frac{\lambda_3}{\lambda_1}CRP_{t-1} + \frac{\lambda_4}{\lambda_1}LO_{t-1} + \frac{\lambda_5}{\lambda_1}PGDP_{t-1}. \tag{4.4}$$

Now, by re-parameterizing,

$$HC_t = \psi_0 + \psi_1 RR_{t-1} + \psi_2 CRP_{t-1} + \psi_3 LO_{t-1} + \psi_4 PGDP_{t-1}, \tag{4.5}$$

where $\psi_1$ , $\psi_{2}$, $\psi_3$, and $\psi_4$ are the long-run parameters; their values and signs determine the long-run relationship between the dependent and independent variables in the model. For the short-run analysis, an error correction model was used.

#### 4.3.2.2 Error Correction Model

When a long-run relationship exists between the variables, then there is an error correction-representative model and, so, the following error correction model is run in the third step:

$$\Delta HC_i = \alpha_0 + \sum_{i=1}^{t} \delta_i \, \Delta HC_{t-i} + \sum_{i=1}^{t} \rho_i \Delta \, RR_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta \, PGDP_{t-i}$$
$$+ \sum_{i=1}^{t} \omega_i \Delta \, Crp_{t-i} + \sum_{i=1}^{t} \varphi_i \, \Delta LO_{t-i} + \gamma ECM_{t-1}. \qquad (4.6)$$

The error correction model corrects the speed of the adjustment of the short-run shocks back to a long-run equilibrium. The coefficient of the $ECM_{t-1}$ determines the speed of adjustment toward equilibrium in the case of any disturbance.

#### 4.3.2.3 Data and Variables Description

This study takes per capita GDP, resource rents, and institutional quality as independent variables and human capital as the dependent variable. The descriptions and the rationale of choosing these variables are as followed:

First, Figure (4.1) clarifies the dependent (DV) and independent variables (IV) in the model, where (IV3) is the variable of interest.

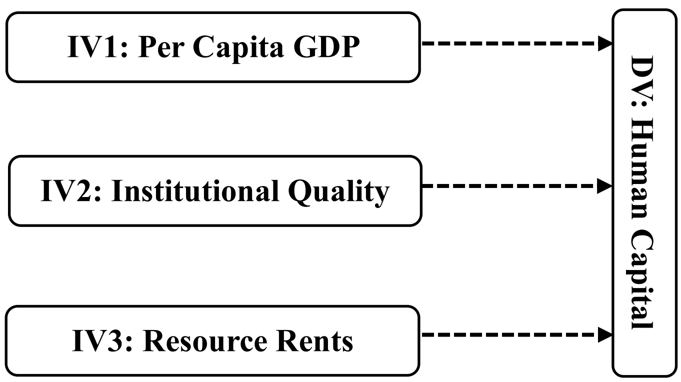



**Figure 4.1.** The dependent and independent variables.
Source: calculated by the author.

A description of the variables and the rationale for their inclusion in the model are presented below.

Human Capital (HC) is challenging to measure but is often measured as the accumulation of education in a country (Sun, et al., 2018; Alan at al., 2008). Human capital theory explains how education is a significant source of human capital which, in time, is an important component in economic growth (Acevedo, 2008). The present study takes the human capital index, based on the average years of schooling and an assumed rate of return, in terms of education, as the measure of human capital (Barro and Lee, 2013; Psacharopoulos, 1994).

The data were sourced from the Penn World Tables v9.0 (Feenstra et al., 2015), as used in Ali et al. (2018) and Kim and Lin (2017).

The human capital index was selected as it is the closest representation of the quality of education; several studies have supported the fact that the quality of education is more critical to consider than the quantity of education for growth (Jamison et al., 2007; Coulombe and Tremblay, 2006; Bosworth and Collins, 2003; Woessmann, 2002, 2003; Barro, 2001; Hanushek and Kimko, 2000). Figure (4.2) shows that, in 2014, the highest human capital index was in UAE and the lowest was in KWT.

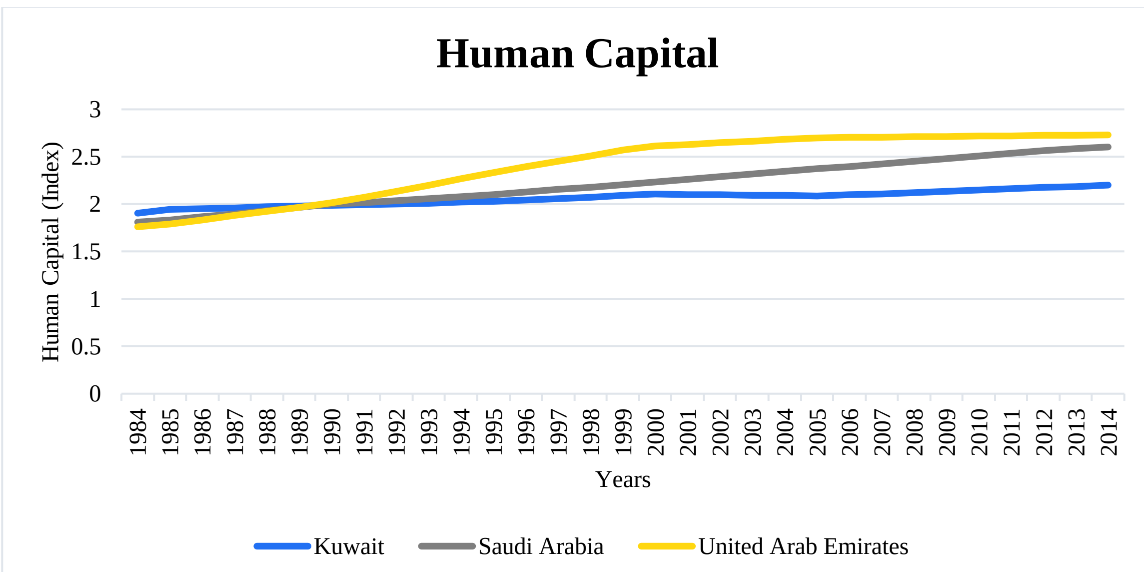



**Figure 4.2.** Human Capital Index.
Source: Author, based upon data taken from the Penn World Table (Feenstra et al., 2015).

Per capita GDP (PGDP) was used as an indicator following several studies that considered PGDP as a proxy for the degree of development in a country (Olayungbo and Adediran, 2017; Akpan and Chuku, 2014; Busse and Groening, 2013; Arezki and Van der Ploeg, 2011). There is a strong link between PGDP and human capital. High national income is used to allocate more resources to improve human capital and to support an institutional environment that encourages learning and schooling (Bruckner and Gradstein, 2013; Bils and Klenow, 2000). The data on PGDP was derived from the World Development Indicators (World Bank, 2017) for the period 1984–2014, and the natural logarithm was taken for this variable. The data were taken as the GDP (constant 2010 USD) divided by the population of each country for the said period to obtain the per capita GDP, where the population data was obtained from the World Bank (2017). PGDP and GDP are mirrored in Figures (4.3a) and (4.3b), respectively. As KWT is a small country with a small population, it was expected to show the highest level of PGDP. However, UAE started to reach a higher level in 2013. KSA shows the lowest level of PGDP, with very small fluctuations when compared to the other two countries. KWT has the smallest GDP due to its size when compared to UAE and KSA.

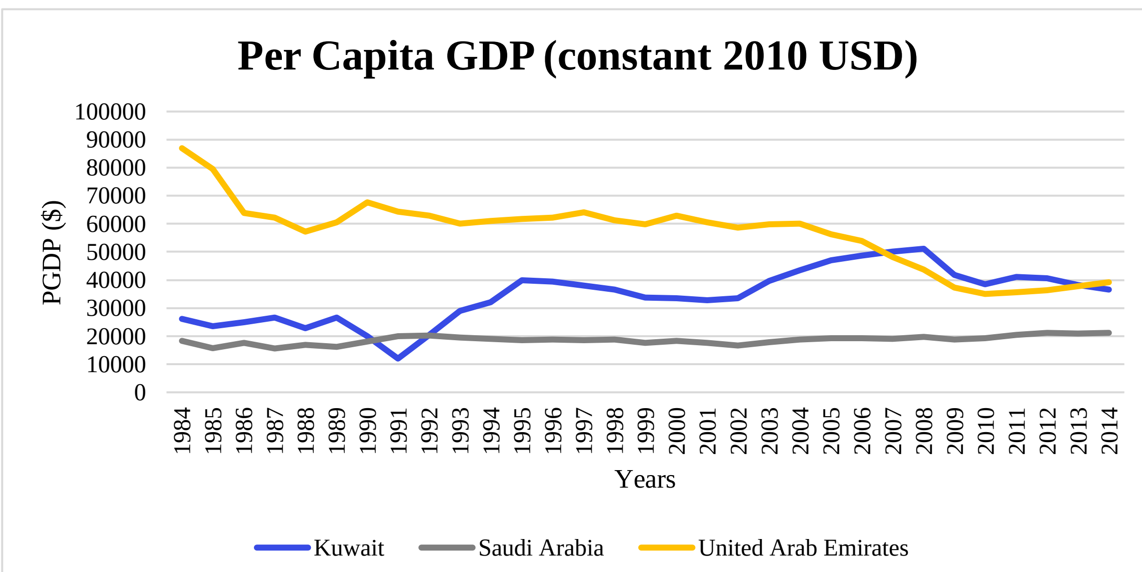



**Figure 4.3a.** Per Capita GDP (constant 2010 USD).
Source: Author, based upon data taken from the World Bank (2017).

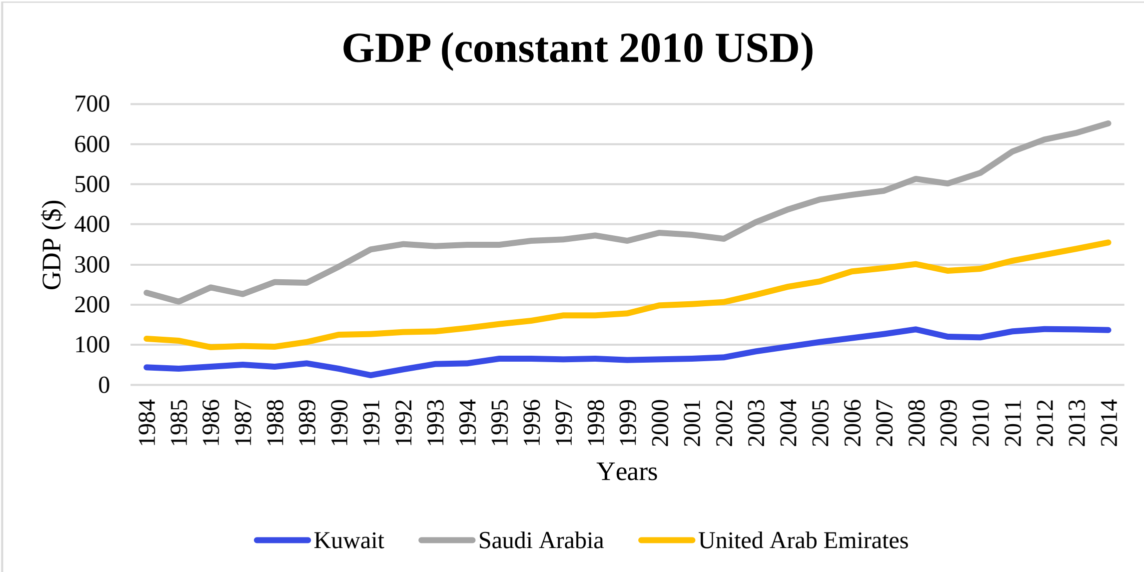



**Figure 4.3b.** GDP (constant 2010 USD)
Source: Author, based upon data taken from the World Bank (2017).

Weak institutional quality, in the form of high corruption and weak law and order, hinders human capital development (Chimezie and Prince O., 2016; Azfar and Gurgur, 2008; Svensson, 2005). This study uses corruption (CRP) as a proxy for Institutional Quality (IQ), following past studies (Okada and Samreth, 2017; Tebaldi and Elmslie, 2013; Boschini et al., 2013; Busse and Groening, 2013; Herzfeld and Weiss, 2003; Knack and Keefer, 1995). This study also investigates the situation of law and order (LO) as an independent variable. The data for the two variables was provided by the International Country Risk Guide (ICRG) by the PRS Group, from 1984–2014. The CRP variable assesses the level of corruption within a political system and includes financial corruption, such as demands for special payments and bribes in connection with import and export licenses, exchange controls, tax assessments, excessive patronage, nepotism, or secret party funding (Busse and Groening, 2013; Aidt et al, 2008). As stated in Knack and Keefer (1995), LO reflects "the degree to which the citizens of a country are willing to accept the established institutions to make and implement laws and adjudicate disputes". Figure (4.4a) shows the corruption level in each country, where UAE had the lowest level and KSA had the highest. Furthermore, it can be noticed, in Figure (4.4b), that the variation between countries is relatively small in the 'law and order' index.

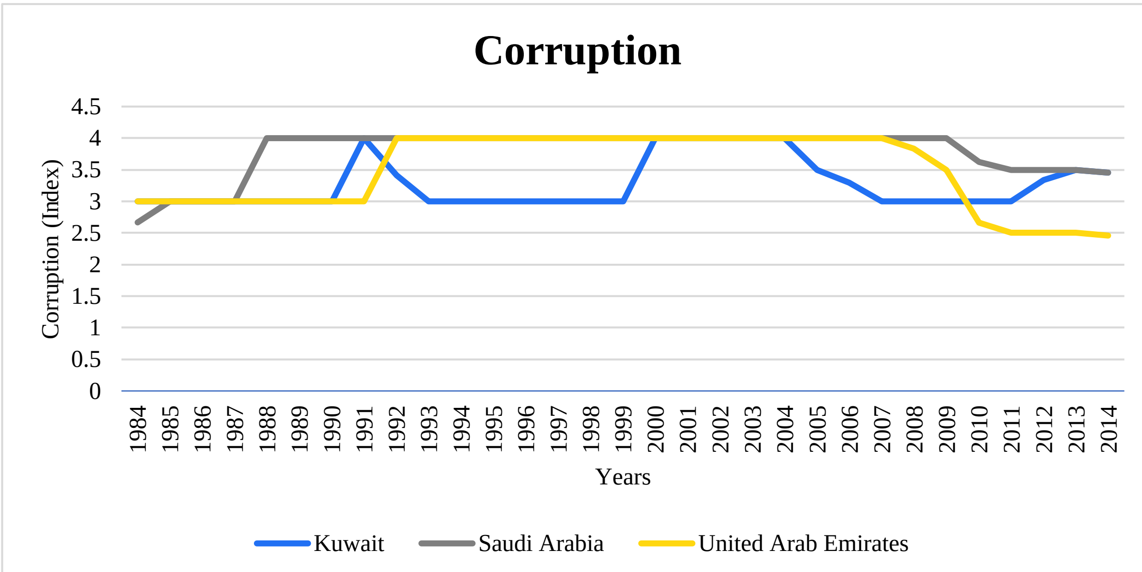



**Figure 4.4a.** Corruption Index.
Source: Author, based upon data taken from the ICRG (2017).

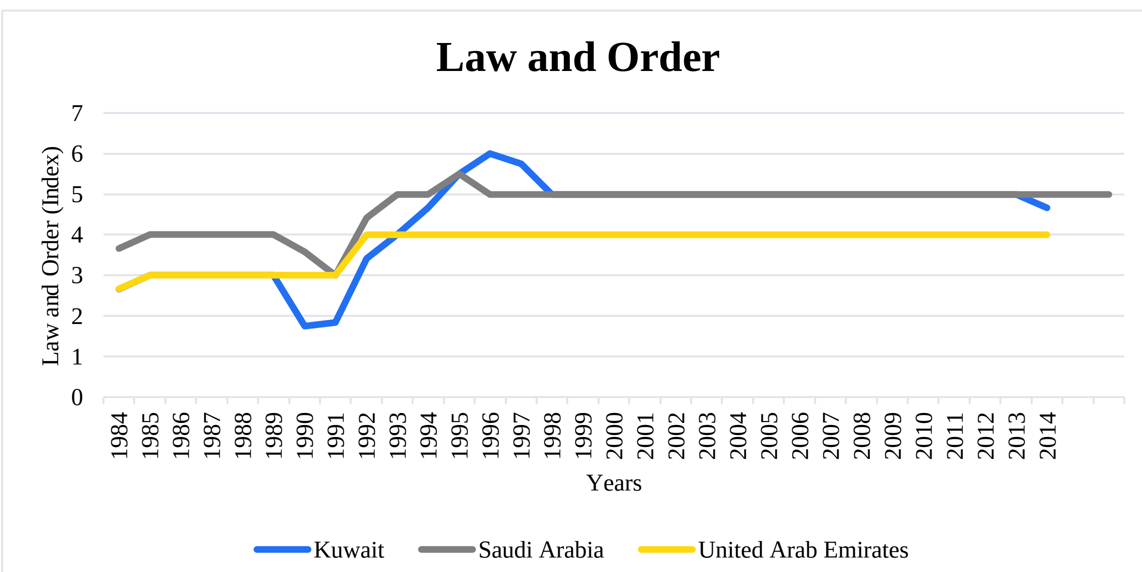



**Figure 4.4b.** Law and Order.
Source: Author, based upon data taken from the ICRG (2017).

The literature has presented two different views of the impacts of resource rents on human capital. One view is that resource rents discourage investment into education and the obtainment of high skills, as people may obtain jobs with less skills in resource-based sectors (Gylfason, 2001; Gylfason et al., 1999). The other view is that resource-rich countries have the capacity to invest and spend more in education to increase human capital. To estimate this phenomenon, the study takes resource rents (RR) as an independent variable, and the natural logarithm was taken for this variable. The total natural resource rents (% of GDP) data was taken from the World Development Indicators (WDI) provided by the World Bank (2017). It is defined as the total percentage of GDP associated with sales of natural resources (World Bank, 2017). RR is the value of interest in this study, and it is selected following Okada and Samreth (2017), Elbadawi and Soto (2015), Farhadi et al. (2015), Bhattacharyya and Hodler (2014), Anthonsen et. al (2012), Blanco and Grier (2012), and Atkinson and Hamilton (2003). Hereafter, when resource rents is mentioned, it refers to the resource rents as a proportion of GDP. Figure (4.5) below presents the resource rents. As Kuwait had the highest percentage among the countries compared in the chart below, this indicates that Kuwait had the highest degree of dependency on natural wealth.

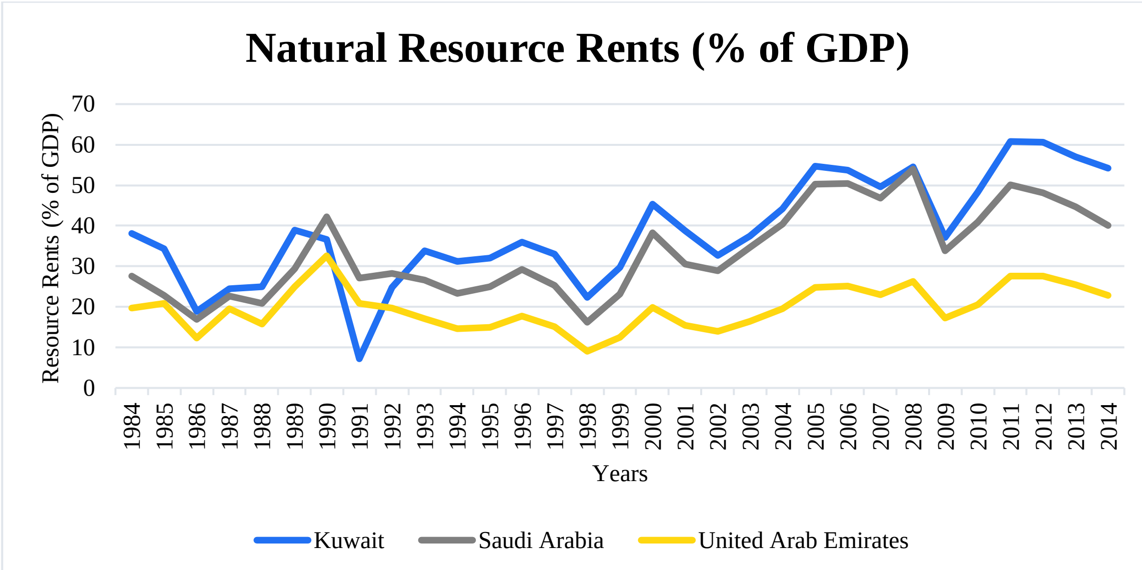



**Figure 4.5.** Natural Resource Rents (% of GDP).
Source: Author, based upon data taken from World Bank (2017).

## 4.4 Results and Discussion

### 4.4.1 Unit Root Test

Checking the order of integration of the variables is a pre-condition for any co-integration technique. For this purpose, augmented Dickey–Fuller **(**ADF) and Phillips–Perron (PP) tests are applied. The results of the unit root test of (ADF) are reported in Table (2.1). In KWT, the null hypotheses of the unit root could not be rejected at the 5% level of significance for per capita GDP, human capital, and corruption. Thus, these variables are integrated of order 1 (i.e., I(1)). The other variable under consideration, resource rents, is stationary at level (i.e., I(0)). However, for law and order, reported results for ADF indicate the rejection of null hypothesis at level while PP test indicates non-stationarity at level, while the series is stationary with a first difference transformation (Appendix B., Table B3).

The results were found to be similar for the KSA and the UAE, as reported in Table (2.1). It was found that the null hypotheses of the unit root at level could not be rejected at a 10% level of significance for PGDP, human capital, corruption, and law and order, but these variables were stationary at first difference. However, resource rents were stationary at level (i.e., I(0)).

### 4.4.2. The ARDL and Bound Test

Table (2.1) reports two very important features regarding the univariate characteristics of the variables used in the case of the three countries. First, all variables followed different orders of integration (i.e., I(1) and I(0)). Second, all the proposed dependent variables were integrated of order one. These two characteristics of variables granted the application of ARDL, as these characteristics are also important prerequisites. The other prerequisite for ARDL is the existence of co-integration between the I(0) and I(1) variables. This was done by a co-integration bound test (Pesaran et al., 2001), where the bound-testing procedure was based on the Wald-test (F-test). Pesaran et al. (2001) stated two critical values for the co-integration test. The lower critical bound assumes all variables are I(0), meaning that there is no co-integration relationship between the examined variables, while the upper bound assumes that all variables are I(1), meaning that there is co-integration among the variables. When the computed F-statistic is greater than the upper bound critical value, then the null hypothesis that the variables are co-integrated is rejected. If the F-statistic is below the lower bound critical value, then the null hypothesis cannot be rejected. The results in Table (4.1) show that the values of the F-statistics were higher than the upper bound in a 95% confidence interval for the three countries. The value was (4.63) for human capital in KSA, (4.70) in KWT, and (33.62) in UAE.

These results confirm that, for all equations, there was at least one short or long-run co-integrating relationship between the I(0) and I(1) variables. The regression results follow, as all prerequisites to apply ARDL have been achieved.

**Table 4.1 Co-integration Bound Test Results.**

| Country | Kuwait | | The Kingdom of Saudi Arabia | | The United Arab Emirates | |
|---|---|---|---|---|---|---|
| Dependent Variable | F- Statistic | K | F- Statistic | K | F- Statistic | K |
| Human Capital | 4.70 | 3 | 4.63 | 4 | 33.62 | 4 |

### 4.4.3 Short-Run and Long-Run Results of the impacts of Natural Resources on Human Capital in Kuwait, the Kingdom of Saudi Arabia, and the United Arab Emirates

We estimated the model for human capital (HC) and resource rents (RR) while controlling corruption (CRP), law and order (LO), and PGDP; the results are shown in Table (4.2). The stability of the model was verified by the error correction term, which depicts that 49% of the error was corrected every year successfully in the case of KWT, 11% in KSA, and 10% in UAE.

**Table 4.2 Impact of Resource Rents and Institutional Quality on Human Capital in Kuwait, Kingdom of Saudi Arabia, and United Arab Emirates.**

| Short-run results | | | | | | |
|---|---|---|---|---|---|---|
| **Country** | **Kuwait** | | **The Kingdom of Saudi Arabia** | | **The United Arab Emirates** | |
| **Variable** | **Coefficient** | **t-Statistics** | **Coefficient** | **t-Statistics** | **Coefficient** | **t-Statistics** |
| **Human Capital (-1)** | 0.606*** | 3.979 | | | | |
| **Resource Rents** | –0.074* | -1.847 | –0.012 | –0.456 | –0.001 | –0.102 |
| **Resource Rents (-1)** | 0.071 | 1.576 | | | –0.013* | –1.764 |
| **Per capita GDP** | | | –0.312*** | –3.044 | 0.000 | 0.015 |
| **Per capita GDP (-1)** | | | | | 0.172*** | 3.900 |
| **Corruption** | –0.002 | –0.076 | –0.089* | –1.689 | –0.001* | –1.689 |
| **Corruption (-1)** | | | | | 0.009 | 1.345 |
| **Law and Order** | 0.0056 | 0.226 | 0.004 | 0.294 | 0.029** | 2.302 |
| **CointEq (-1)** | –0.491*** | –3.753 | –0.110** | –2.365 | –0.107*** | –8.404 |
| **Long-run results** | | | | | | |
| **Variable** | **Coefficient** | **t-Statistics** | **Coefficient** | **t-Statistics** | **Coefficient** | **t-Statistics** |
| **Resource Rents** | –0.495* | –2.015 | –0.596** | –2.695 | –0.169* | –1.790 |
| **Per capita GDP** | | | 0.572*** | 2.831 | –0.245 | –0.869 |
| **Corruption** | –0.099** | –2.127 | 0.812 | 1.094 | –0.140* | –1.801 |
| **Law and Order** | 0.069** | 2.554 | –0.040 | –0.319 | 0.276** | 2.465 |
| **C** | 0.930* | 1.995 | –25.814 | –1.502 | 5.234 | 1.382 |

Note: ***, **, and * denote the significance at the 99%, 95%, and 90% confidence interval respectively.
Note: In this study, the variable of PGDP in the case of KWT was excluded due to the problem of multicollinearity between PGDP and resource rents.

### 4.4.3.1. Results in Kuwait

The results show that human capital was largely determined by its own lag. A 1% increase in one-year lag for human capital enhanced the current human capital by 0.60%. Resource rents (% of GDP) had an immediate negative effect on human capital: A 1% increase in Resource rents (% of GDP) reduced human capital by 0.07%, at a 10% level of significance.

However, the long-run effect was far larger than short-run effect, where a 1% increase in the proportion of resource rents in the KWT GDP reduced human capital by 0.49%.

The effect of corruption on human capital occurred in the long-run, where it reduced human capital significantly by 0.09% relative to a 1% increase in corruption; however, it was insignificant in the short-run. The positive effect of law and order on human capital was also manifested in the long-run, where a 1% increase in law and order increased human capital by 0.069%. A perspective of the data and results is presented in Appendix C. (Figure C10, Section 4.1).

The cumulative sum control chart (CUSUM) and CUSUM of Squares tests were applied to check the stability of the model; both tests indicated that the model was stable (Appendix D., Figures D19 and D20).

#### 4.4.3.2 Results in the Kingdom of Saudi Arabia

In the case of KSA, resource rents (% of GDP) had an insignificant impact on human capital in the short-run; however, they deteriorated human capital in the long-run by 0.59% relative to a 1% increase in the proportion of resource rents in the KSA GDP. PGDP was significant in both terms, but with different effects. It was found that high PGDP weakened human capital in the short-run by 0.31% per 1% increase in PGDP, but enhanced human capital in the long-run by 0.57% per 1% increase in PGDP. Corruption was only significant in the short-run at the 10% level, where a 1% increase in corruption caused human capital to deteriorate by 0.08%. However, the variable of law and order had no effect on human capital, as it was statistically insignificant in both the short- and long-run in KSA. Additional analysis of the data and results in KSA is presented in Appendix C. (Figure C11, Section 4.2).

The CUSUM and CUSUM of Squares tests were applied and both tests approved the stability of the model (Appendix D., Figures D21 and D22).

#### 4.4.3.3 Results in the United Arab Emirates

In the case of UAE, the one-year lag form of resource rents (as proportion of GDP) negatively affected human capital in the short-run, and the same effect appeared in the long-run between resource rents and human capital. A 1% increase in the proportion of resource rents in the UAE GDP decreased human capital by 0.16%. Corruption showed a negative relationship with human capital, in both the short- and long-run, in the 90% confidence interval. Human capital deteriorated by 0.001% in the short-run and 0.14% in the long-run, per 1% increase in corruption.

In the 95% confidence interval, the variable of law and order positively affected human capital in both the short- and long-run, by 0.02% and 0.27% per 1% increase in law and order, respectively. In regard to PGDP, the one-year lag of PGDP showed a significant positive relationship with human capital only in the short-run. Further assessment of the results of the UAE during the period under study is given in Appendix C. (Figure C12, Section 4.3).

The CUSUM and CUSUM of Squares tests were applied and both tests approved the stability of the model (Appendix D., Figures D23 and D24).

### 4.4.4 Overall Discussion

The previous section presented the different results for each country, and each country displayed different results, depending on its own condition, characteristics, and experience. However, there were some similarities between the countries, which shall be introduced in the discussion of the impacts of resource rents, institutional quality, and PGDP on human capital, below.

#### 4.4.4.1 Natural Resource Rents

A percentage increase of natural resources in the KWT GDP appeared to reduce human capital in the short-run. Similarly, resource rents reduced human capital in all of the three countries under study in the long-run.

There are few possibilities for the negative effect of resource rents (% of GDP) on human capital. Natural resource richness causes countries to assign inadequate attention and expenditures to education (Behbudi et al., 2010). Another possibility is that resource-rich countries consider the huge revenues from mineral production and exportation as secured income and, hence, they are prone to neglect the development of human capital (Gyfalson, 2001); furthermore, huge natural resource windfalls trigger a false sense of security and overconfidence about natural resource wealth, causing authorities and individuals to consider it to be the most important asset of their country (Sachs and Warner, 1999). This would be reflected, on a country-wide level, in neglecting the importance of human resources by allocating less budget and attention to education. Additionally, at the individual level, this wealth would diminish the need to educate children, which would cause the quality of education to have less priority (Gylfason et al., 1999). Furthermore, resource richness plays a major part in changing the economy, as people start getting jobs in the energy sector which pay high wages and require less skills (Gylfason et al., 1999). Our findings support what is known as the "social resource curse" (Shao and Yang, 2014; Carmignani, 2013; Sarr and

Wick, 2010; Behbudi, et al., 2010; Gylfason, 2008; Bravo-Ortega and De Gregorio, 2005; Gylfason, 2001).

#### 4.4.4.2 Institutional Quality

In UAE and KSA, corruption deteriorated human capital in the short-run and the same effects were observed in KWT and UAE in the long-run. These findings are consistent with Chimezie and Prince (2016), who found that corruption harms the educational system in resource-rich countries by reducing funding for health and education, wasting good opportunities, and influencing education outcomes. Similar results were found by Akpan and Chuku (2014) and Azfar and Gurgur (2008).

Moreover, law and order positively affected human capital in UAE in the short-run, and in UAE and KWT in the long-run, which supports the findings of Faruq and Taylor (2011). However, this study found the effect of law and order on human capital to be insignificant, both in the short- and long-run, in KSA.

Our findings on the impact of institutional quality on human capital appear to support the fact that an enhancement in the institutional environment encourages education expenditure and increases incentives to learn, with subsequent improvement in human capital (Hanushek and Woessmann, 2007; Glaeser et al., 2004).

#### 4.4.4.3 Per Capita GDP

The possibilities of the negative effect of PGDP on human capital in KSA and the insignificant results in KWT can probably be related to the same possibilities that caused resource rents (% of GDP) to negatively affect human capital, as countries with higher incomes may become overconfident about their income and have a false sense of security, which drives these countries to neglect their human resources by giving less attention to the quality of their human capital; in particular, with respect to both education and health (Gylfason et al., 1999; Sachs and Warner, 1999, 1995).

However, our results show that, in the long-run, this negative effect in KSA turned positive. Besides, this positive effect appeared in UAE from the one-year lag of PGDP in the short-run. The logic behind this is that income describes the well-being of individuals and, so, income growth drives schooling (Bils and Klenow, 2000). This is likely to happen when the high national income is used appropriately by assigning more resources to education, increasing access to higher levels of education and knowledge, offering more opportunities and expenses for educated workers and education, and supporting an institutional environment that is favourable to education (Bruckner and Gradstein, 2013).

The insignificant results in KWT are consistent with the observation of some studies that the relationship between PGDP and human capital is insignificant (McDonald and Roberts, 2002; Knowles and Owen, 1995).

## 4.5 Conclusion

This study investigated the nexus between natural resource dependence (measured as resource rents as a proportion of GDP) and human capital development, in order to cover the social aspects of the resource curse in Gulf Countries. The study has applied the ARDL model and co-integration by taking human capital as dependent variable and deriving evidence based on time-series data collected from 1984 to 2014.

Natural resource rents (% of GDP) appeared to crowd out education (which was used as a proxy for human capital) in the long-run, in the three cases of KWT, KSA, and UAE. The crowding-out effect of resource rents on education operated in the short-run in KWT and in UAE with the one-year lag form of resource rents. In fact, this could slow down the pace of the progress of economic development, since the endogenous growth theory highlights the role of human capital in guaranteeing long-term economic growth. The crowding-out effect on human capital in the three countries, due to natural resource rents, predictably leads to low economic growth and development in the long-term, resulting in the resource curse phenomenon, as this crowding-out effect is one of the transmission channels by which the resource curse impacts economies. Other sources have suggested that the reason behind the crowding-out effect is due to the false sense of security that reduces the incentive for households to educate their children and pushes governments to keep education at a low priority. The results confirm the social resource curse in GCs and raise questions concerning the appropriate tools to implement in order to avoid or control the crowding-out effect on human capital, which is out of the scope of this study and needs to be further considered.

Corruption deteriorated human capital, while law and order enhanced it, in the case of KWT, only in the long-run. In the case of KSA, corruption worsened human capital immediately. The same results appeared in UAE, but they were consistent in both the short- and long-run. This was justified, in that high institutional quality increases the incentives to learn and raises the skill of the labour force. According to the results, in order to improve human capital, there is an instant need to ensure better law and order conditions, control corruption, and enhance the overall institutional environment, which must go hand in hand with any plans to enhance human capital. However, more work needs to be done to recognise efficient methods to improve institutional quality at the country level in order to guarantee human capital development, as this is beyond the scope of this study.

High PGDP in KSA deteriorated human capital in the short-run but enhanced human capital in the long-run. However, in the case of UAE, the one-year lag of PGDP improved human capital in the short-run. Logically, PGDP describes the well-being of individuals, so PGDP growth drives schooling by assigning more resources to education, increasing access to higher levels of education and knowledge, and offering more opportunities and expenses for educated workers and education.

Presently, natural resource rents are believed to be a blessing for GCs, as these huge windfalls boost investments, employment, and PGDP. Accordingly, they are expected to improve human capital; yet, resource rents cause a deterioration in human capital. As a result, these deterioration effects cause an over-reliance on non-renewable resources. As there is a global shift toward renewable energy, this blessing could turn into a curse by slowing the pace of economic development. Moreover, inadequate institutions and support mechanisms for education and skill development perpetuate limited access to institutions for training and learning.

All in all, exporting natural resources can raise the financial revenues and reduce the budget constraints of government expenditures, even though these revenues are volatile and uncertain. Therefore, GCs should be able to develop their citizens education, due to their mass wealth and abilities, in order to utilize the revenues from natural resources to enhance and develop the quality of human capital and, consequently, utilize the knowledge and skills attained by their citizens effectively in wealth creation and, hence, development. The idea that human capital development is able to provide individuals with the recipes they need to confront modern developmental problems and challenges has been supported in past studies (Hanushek and Woessmann, 2007; Hanuschek and Kimko, 2000; Krueger and Lindahl, 2001;

Richardson,1997; Barro and Sala-i-Martin,1997; Psacharopoulos, 1973) and human capital is considered to be one of the greatest resources and wealth of nations, which manages other resources in order to achieve long-term growth (Harbison, 1971). Therefore, ignorance of this important human resource is a matter of contention.

Governments in resource-rich Gulf Countries should, first, realise the necessity of being aware of the existence of the resource curse in their economies; that is, the issues and complications in relation to natural resource wealth and their serious effects on their long-term growth and development, which is the scope of the study. Then, governments should take serious steps towards tackling these issues and implementing the right policies; however, this is a complex step and often multiple policies should be considered. Some critical questions which arise are: Which policy should be implemented to guarantee a good quality of education? What are the benefits and costs of increasing investments in education? Is increasing expenditures in education an efficient policy or should governments consider major improvements in the quality of education? How can educational opportunities be augmented, and how can the population be encouraged to receive education? These questions must be further examined.

If governments realised and appreciated the relevance and necessity of human capital in both tackling the crowding-out effects of natural resources and as a means for placing their countries on the long-term growth and sustainable development path, then governments would alter their budgets, decisions, and policies towards this direction.

# 5

# DISCUSSION AND CONCLUSIONS

## 5.1 Introduction

The main contribution of this thesis is to illustrate the significance of the existence of non-renewable natural resource wealth and how the dependence on this wealth produces several challenges in the economy. Moreover, the thesis highlights whether these resources are a blessing or a curse in an approach to question the relevance of the resource curse phenomena in resource rich countries, and specifically in the three Gulf Countries—Kuwait, the Kingdom of Saudi Arabia and the United Arab Emirates—as a reference to adopt and implement the optimal policies in the future.

## 5.2 Discussion

The main objective of this study is to show the impacts of natural resource dependence on the different aspects of the economy, given the importance of the Gulf Countries and their dependency on natural resource income. Since there is lively debate about the relationship between natural resource dependence and economic growth (Oyinlola et al. 2015, with others), it is beneficial to present a clarification of these impacts on economic, political and social domains by stating the general question of the thesis, which looks at whether natural resource dependence enhances or damages per capita GDP, TFP, institutional quality and human capital in the short-run and long-run in Gulf Countries.

To address the research questions, time series data from 1984 to 2014 was selected. The augmented Dickey–Fuller (ADF) unit root tests indicated that all variables followed different orders of integration, i.e., I(1) and I(0), and the co-integration bound test based on the Wald-test (F-test; Pasaran et al.,2001) suggested that co-integration existed between the variables, demonstrating the existence of short- and long-run relationships. The application of the ARDL model and the co-integration technique were followed to analyse the short-run and long-run impacts of resource dependence in the three countries. This accomplishment seeks to provide policy makers and governments with pointers to which domains or areas to consider, highlight, and prioritize when developing the policies that obtain high economic growth and overcome the challenges of natural resource dependency.

The results indicate that in the case of KWT, resource rents increase PGDP, corruption and TFP immediately, but reduce TFP, institutional quality and human capital in the long-term. In KSA, resource rents show an immediate increase in corruption, and increase TFP and PGDP in the long-run but weaken human capital. Resource rents in UAE show an immediate increase in PGDP, TFP and corruption, and increase PGDP in the long-run. However, rents weaken human capital in the long-run.

The long-run results that focused on the economic transmission channel of the resource curse are concerned with PGDP and TFP. Therefore, since KWT is the only country that shows a deteriorating effect from resource rents on TFP, KWT exhibits the economic aspect of the resource curse. This indicates that huge windfalls from resources are not contributing to increase productivity or growth, thus high dependency on rents from natural resources could be harmful to KWT.

Checking the impact of natural resources on productivity and growth in the first study (chapter two) did not provide a clear picture about the transmission channels. Therefore, further indicators that cover the political aspect of the resource curse were tackled.

The results that focused on the political transmission channel of the resource curse are concerned with institutional quality (corruption). The results revealed that in the long-run, resource rents as a proportion of GDP had a detrimental effect on the ratings of institutional quality in KWT. This was statistically insignificant in the long-run in the case of KSA and UAE, but positive in the short-run, indicating that rents from natural resources are not affecting institutional quality. In fact, the negative and significant effect of the proportion of resource rents in the GDP of KWT on institutional quality means that KWT is facing a political resource curse.

By covering the economic and political aspects of the resource curse, a further step is needed to cover the social aspect due to the importance of human capital and the recent interest in the deteriorating impact of resource dependency on human capital. The social aspect is covered in the fourth chapter to provide a complete picture of the three main aspects of the resource curse.

The long-run results that focused on the social transmission channel of the resource curse are concerned with human capital. The rents as a proportion of GDP appeared to crowd out education (which was used as a proxy for human capital) in the three cases of KWT, KSA, and UAE. These findings reveal that the social resource curse is dominant in the three countries, which could slow down the pace of progress of economic growth and development, due to the importance of human capital in guaranteeing long-term economic growth in the endogenous growth theory.

In fact, KWT is the only country that is experiencing the three aspects or drivers of the resource curse, which can be related to its greater dependency on resource rents in comparison to the other two countries.

The impacts of natural resource dependency on economic growth are by no means comprehensive and universal. There are several factors that determine growth across countries and these factors are correlated in multi-dimensional ways, which create an exclusive case in every country. Therefore, it is important to consider these factors when studying the challenges of resource dependency and the resource curse, since natural resource wealth does not certainly lead to poor economic growth, with theoretical analysis and statistical verification showing that natural resource wealth can have both positive and negative impacts on economic performance. Some academics argue whether the resource curse even occurs or whether the outcomes in an economy are the result of other important factors that determine growth, such as poor institutional quality or neglected human capital.

Next, the thesis questioned whether institutional quality increases or decreases PGDP, TFP and human capital in the short- and long-run in Gulf Countries. In the case of KWT, results indicate that corruption lowers PGDP, TFP and human capital, while law and order settings enhance PGDP, TFP and human capital in the long-run. In KSA, corruption shows immediate harmful effects on PGDP, TFP and human capital, as well as on TFP in the long-run. In addition, the law and order situation in KSA reduces corruption and shows an immediate harm on TFP. In UAE, corruption harms TFP and human capital, but law and order settings increase PGDP, corruption and human capital.

Corruption as one proxy of institutional quality decreases productivity in the long-run in the case of the three countries and decreases human capital in KWT and UAE. KWT is the only country with a harmful effect of corruption on PGDP, whereas law and order, as the other proxy of institutional quality, increases productivity in KWT, and increases PGDP and human capital in KWT and UAE.

The third question of the thesis concerned the impacts of human capital on PGDP, TFP and institutional quality in the short- and long-run in the Gulf Countries. In the case of KWT, results indicate that human capital enhances PGDP and TFP, and decreases corruption. Although human capital harms TFP and PGDP in the short-run in KSA, it enhances TFP and PGDP in the long-run. In UAE, human capital increases TFP and PGDP, as well as decreasing corruption.

Therefore, the results suggest that an increase in the level of human capital in the form of education increases productivity and PGDP in the three countries. It also decreases corruption in KWT and UAE. Thus, human capital is a crucial factor to raise productivity and attain economic growth in the long-run in the region.

Furthermore, the fourth question in this thesis was concerned with the impact of PGDP on institutional quality and human capital in the short-run and long-run in Gulf Countries. The results show that PGDP enhances human capital in the long-run but damages it in the short-run in KSA. The results in UAE reveal that PGDP increases corruption in the long-run.

To conclude, the study provides evidence that the existence of the resource curse is not uniform for all resource rich countries, that is, some countries experience no curse while others show less effects from the curse. This means that the existence of natural resource wealth in a country and an over-reliance on these resources, do not produce the same outcomes in each country, as revealed by the different performances of the three GCs under study. Moreover, the study provides evidence that there are other factors that are responsible for economic outcomes, because they have showed an impact on growth in resource rich countries. Whether this impact is due to the existence of natural resources or not, in addition to the relationships that have existed between these factors, is of a great interest.

In this way, this study provides a new perspective of the scenario in each country, which assists in highlighting the most influential aspect or sector on growth and the appropriate policies that guarantee growth, as well as policies that tackle the challenges of natural resource dependency. To this end, human capital and corruption emerge as examples of crucial factors in the three countries for growth and productivity. Put simply, the rents generated from natural resources foster corruption (in the short-run) and weaken human capital (in the long-run) in the three countries. Similar observations are found in the literature, suggesting the existence of natural resources could be to blame for damaging growth.

## 5.3 Theoretical Implications

To the author's knowledge, this study is the first of its nature to empirically cover the short- and long-run dimensions of natural resource dependence, and to provide a deeper understanding of the resource curse phenomenon and its transmission mechanisms. The country assessments have been made using three resource rich countries in the Gulf region, namely Kuwait, the Kingdom of Saudi Arabia and the United Arab Emirates, using co-integration and an ECM model based on ARDL. Testing the four models that were developed in this study in other resource rich countries will improve their generalizability, as well as the applicability of the findings to other Gulf Countries, in particular.

This study gives a perspective on the critical variables that affect growth in resource rich countries. Together with the existing literature, the study improves knowledge of the impacts of resource dependency and the resource curse. Future scholars can further confirm the assertion that an independent theory of the resource curse is essential in their examinations.

## 5.4 Recommendations for Governmental Associations and Implications for Practice

Governments in resource-rich Gulf Countries should, first, realise the necessity of being aware of the significance of the existence of non-renewable natural resources as well as the existence of the resource curse in their economies; that is, the issues and complications in relation to natural resource wealth and their serious effects on their long-term growth and development, which is the scope of this study. Then, governments should take serious steps towards tackling these issues and implementing the right policies; however, this is a complex step and often multiple policies should be considered. If governments realised and appreciated the relevance and necessity of human capital in both tackling the crowding-out effects of natural resources and as a means for placing their countries on the long-term growth and sustainable development path, then governments would alter their budgets, decisions, and policies towards this direction. Moreover, due to the importance of natural resources as a source of income in these countries, efficient management of these resources and their huge windfalls is vital, since the study supported the fact that TFP and PGDP could be raised by proper management of these revenues.

There is no single method to guarantee the efficient management of natural resources. Accordingly, this study offers authorities pointers to which domains to prioritize and to consider when developing the policies and strategies that help in utilizing the revenues from natural resources and overcoming the challenges from dependency on natural resources. The evidence suggests that human capital and institutions are crucial to growth in the three countries. Thus, authorities have to tailor these two factors to the country's goals and circumstances. Evidently, investing in human capital and improving institutional quality by preventing corruption and maintaining law and order are prerequisites to guarantee a sustainable implementation of the proposed policies and to reach sustainable economic growth and development over time.

At this point, additional studies are necessary to construct the necessary and effective policies to achieve long-term growth and to utilize the resource rents to support this goal.

## 5.5 Thesis Limitations and Directions for Future Research

The outcomes of this research have to be seen in light of some limitations. The first limitation concerns the lack of comprehensive data for total factor productivity in United Arab Emirates; this meant it was necessary to calculate the data from 1984 to 2014, using a Cobb–Douglas production function. Despite this restraint, the results are still valid and based on a commonly used approach, for example, by Alvi and Ahmed (2014), Cole and Neumayer (2006), and Miller and Upadhyay (2000).

Similarly, a lack of comprehensive data for the other Gulf states—Bahrain, Qatar and Oman—reduced the scope of this study from all GCs. Nevertheless, this study gives an opportunity for other studies exploring the resource curse and resource dependency by means of the four models in this study.

This second limitation relates to the law and order variable in the third chapter, as it shows multicollinearity with resource rents in the institutional quality model in the case of Kuwait. In the presence of multicollinearity, there is a chance of over or underestimation of the model, thus it is problematic as the signs or values of coefficients appeared to be biased. The two solutions to this problem are either to drop the less important variable or estimate the model with the same variables. Thus, to solve the problem of multicollinearity, the first solution was applied by dropping the law and order variable. A similar problem of multicollinearity occurred in the human capital model in the case of Kuwait, between PGDP and resource rents. This was solved by dropping per capita GDP. This particular limitation in both incidents did not represent a serious impact on the results and discussion since resource rents is the main variable and there are many independent variables; thus, the approach of dropping one independent variable is considered to be more appropriate in this case.

The third limitation relates to data duration (time period) which was limited to 30 years, from 1984 to 2014, which represented the full extent of publicly available data. Although the data was adequate to show reliable results under the ARDL approach, more data would have been desirable.

Moreover, there is abundant room for advanced investigation in resource rich countries, in particular, about the effect of human capital on institutional quality, and vice versa, as well as the effects of these variables on productivity. Likewise, the effect of natural resources on other variables of institutional quality from the ICRG should be researched, as a way to introduce a complete picture of the political aspect of the resource curse.

There is also scope for comparative studies between resource rich countries that would allow the effect of natural resources to be explored within different countries, for example, a comparison between the Gulf resource rich countries and the technologically advanced resource rich countries such as Norway that have comparable diversification policies.

Furthermore, an extension of this study and the application of the models developed on all GC and other resource rich countries would confirm and improve its generalizability, which is an essential element in any research methodology, as well as improving the applicability of its findings to the other Gulf Countries of Bahrain, Qatar and Oman. However, this was not possible within the time constraints of this project.

Some critical questions have arisen after reaching the findings of the study, which are: Which policy should be implemented to guarantee a good quality of education? What are the benefits and costs of increasing investment in education? Is increasing expenditure in education an efficient policy or should governments consider major improvements in the quality of education? How can educational opportunities be augmented, and how can the population be encouraged to receive education? These questions must be further examined.

Finally, future analysis is needed to determine the different necessary policies and their impact on productivity and growth, and most importantly to find the most efficient approach to manage natural resource rents, and to utilize these rents between sectors. When a resource rich country can perfect this step, other good results will follow to reach high productivity and growth.

## 5.6 Conclusions

Since the phenomena of the resource curse lacks a precise explanation, the study provides evidence that the effects of dependency on natural resources is not uniform for the selected resource rich Gulf Countries, and, while these effects are by no means comprehensive, they are complicated. The outcomes of the study support the findings of the wider literature that these challenges and the determinant factors of growth differ in every resource rich country, hence the situation expresses a dilemma of natural resource wealth.

The evidence in this study illustrates that natural resources by themselves are not a curse in the long-run for UAE and KSA. However, for them to promote growth they need to be combined with human capital development and high institutional quality as supported by empirical and theoretical studies. In fact, KWT is the only country that is experiencing the three aspects or drivers of the resource curse, which can be related to its size, institutions and its greater dependency on resource rents in comparison to the other two countries.

The findings are of particular importance for governments in the selected Gulf Countries, since the study supports the fact that TFP and PGDP could be raised by more judicious of resource revenues, development of human capital and maintenance of a good institutional environment.

Since institutions and human capital exhibit critical roles in the three countries, they should be tailored to the circumstances and goals of each country. Human capital and institutions are unique in every country due to individual settings and circumstances. In the long-run, human capital increased productivity and PGDP in the three countries, and corruption decreased productivity in the three countries and decreased human capital in KWT and UAE, while KWT is the only country with a harmful effect of corruption on PGDP. Law and order increased productivity in KWT, in addition to PGDP and human capital in KWT and UAE.

Rents from natural resources are beneficial for Gulf Countries since these huge rents were crucial in raising welfare and per capita income. Nevertheless, the observed deterioration in human capital could turn this blessing into a curse by slowing the pace of economic development. The results confirm what is known as the social resource curse, as this crowding-out effect is one of the transmission channels by which the resource curse impacts economies. These results highlight the false sense of security in GCs that reduce the incentives of citizens and governments to prioritize human capital development. These findings should be seriously considered, most notably because of the importance of human capital to achieve sustainable development.

This raises questions concerning the appropriate tools to implement in order to avoid or control the crowding-out effect on human capital, which is outside of the scope of this study but needs to be further considered.

The evidence suggests that human capital can mitigate the deteriorating impacts of natural resource dependency, as it increases the level of institutional quality (low corruption) in the case of KWT and the UAE. Moreover, human capital increases PGDP and TFP in the three countries. Accordingly, there is a need to enhance the level of education in these countries, but the optimal level of education needed to be attained was outside of the scope of this study. According to the short- and long-run results, in order to improve human capital, there is an instant need to ensure better law and order conditions, control corruption, and enhance the overall institutional environment, which must go hand-in-hand with any plans to enhance human capital. However, more work needs to be done to recognise efficient methods to improve institutional quality at the country level in order to guarantee human capital development, as this is beyond the scope of this study.

Overall, producing and exporting natural resources raises the rents and reduces the budget constraints of government expenditures, despite their volatility and uncertainty. Therefore, GCs should be able to utilize the rents from natural resources to develop and enhance their citizens' education and, consequently, use the knowledge and skills attained by their citizens effectively in wealth creation, hence leading to growth and development. This is related to the notion that human capital development is able to provide individuals with the recipes they need to tackle the challenges and problems of modern development. Moreover, human capital is considered to be one of the greatest resources and sources of wealth of nations that allows the management of other resources in order to achieve long-term growth. Therefore, ignorance of this important human resource is a matter of contention.

If governments realised and appreciated the relevance and necessity of human capital in tackling the crowding-out effects of natural resources, and as a means of placing their countries on the long-term growth and sustainable development path, then they would alter their budgets, decisions, and policies towards this direction.

# REFERENCES

Abdullah, A., Doucouliagos, H., and Manning, E. (2015) 'Does education reduce income inequality? A meta-regression analysis', *Journal of Economic Surveys*, 29(2), pp. 301-316. DOI: 10.1111/joes.12056

Abdullah, N. H., Shamsuddin, A., Wahab, E., and AbdulHamid, N. A. (2013) 'The Relationship between Organizational Culture and Product Innovativeness', *Procedia - Social and Behavioral Sciences*, 129, pp. 140-147. DOI: 10.1016/j.sbspro.2014.03.659

Abramovitz, M. (1956) 'Resource and Output Trends in the United States Since 1870', in Abramovitz, M. (ed.) *Resource and Output Trends in the United States Since 1870*, pp. 1-23, Available at: http://www.nber.org/chapters/c5650.pdf (Accessed: 20 December 2018).

Acemoglu, D. and Robinson, J. (2010) 'The Role of Institutions in Growth and Development', *Review of Economics and Institutions*,1(2), pp. 1-33. DOI:10.5202/rei.v1i2.14

Acemoglu, D. and Robinson, J.A. (2012) '*Why Nations Fail: The Origins of Power, Prosperity, and Poverty'.* United States*:* The Crown Publishing Group.

Acemoglu, D., Gallego, F. and Robinson, J. (2014) 'Institutions, human capital and development', *Annual Review of Economics*, 6(2014), pp. 875-912. DOI: 10.1146/annurev-economics-080213-041119

Acemoglu, D., Johnson, S. and Robinson, J. A. (2001) 'The Colonial Origins of Comparative Development: An Empirical Investigation', *The American Economic Review*, 91(5), pp. 1369-1401. Available at: http://www.jstor.org/stable/2677930 (Accessed: 23 December 2018).

Acemoglu, D., Johnson, S. and Robinson, J. A. (2002) 'Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution', *Quarterly Journal of Economics*, 117 (4), pp. 1231-1294. DOI: 10.3386/w8460

Acemoglu, D., Johnson, S. and Robinson J. (2005) 'The rise of Europe: Atlantic trade, institutional change, and economic growth', *American Economic Review*, 95 (2), pp. 546-579. DOI: 10.3386/w9378

Acemoglu, D., Johnson, S. and Robinson, J. A. (2005) 'Institutions as a Fundamental Cause of Long-Run Growth', in Aghion, P. and Durlauf, S.N. (eds.) *Handbook of Economic Growth Volume 1A*, pp. 386-472. Available at: https://scholar.harvard.edu/files/jrobinson/files/jr_institutionscause.pdf (Accessed: 19 December 2018).

Acevedo, S. (2008) 'Measuring the Impact of Human Capital on the Economic Growth of South Korea, *The Journal of the Korean Economy*, 9(1), pp. 113-139. Available at: file:///C:/Users/raalj/AppData/Local/Packages/Microsoft.MicrosoftEdge_8wekyb3d8bbwe/

TempState/Downloads/Measuring_the_Impact_of_Human_Capital_on_the_Econo%20(1).pdf. (Accessed: 22 September 2017).

Ades, A., and Di Tella, R. (1999) ‘Rents, competition, and corruption’, *American Economic Review,* 89(4), pp. 982–993. DOI:10.1257/aer.89.4.982

Agbor, J. A. (2015) ‘Effects of Primary, Secondary and Tertiary Education on Conflict Intensity in Africa’, *Economies,* 3(4), pp. 161-185. DOI:10.3390/economies3040161

Aghion, P., and P. Howitt. (1992) ‘A Model of Growth through Creative Destruction’, *Econometrica*, 60(2), pp, 323–351. DOI:10.3386/w3223

Aghion P., and Howitt, P. (1998) ‘Endogenous growth theory’. Cambridge, MA: MIT Press.

Aghion, P., Caroli, E., and García-Peñalosa, C. (1999) ‘Inequality and Economic Growth: The Perspective of The New Growth Theories’, *Journal of Economic Literature,* 37(4), pp. 1615-1660. DOI: 10.1257/jel.37.4.1615

Aghion, P., Blundell, R., Griffith, R., Howitt, P. and Prantl. S. (2009) ‘The effects of entry on incumbent innovation and productivity’, *Review of Economics and Statistics,* 91(1), pp. 20-32. DOI:10.1162/rest.91.1.20

Ahmadov, I., Mammadov, J. and Aslanli, K (2013) ‘Assessment of Institutional Quality in Resource-Rich Caspian Basin Countries’, MPRA Paper No. 47430. DOI: 10.2139/ssrn.2274813

Ahmed, K., Mahalik, M.K, and Shahbaz, M. (2016) ‘Dynamics between economic growth, labor, capital and natural resource abundance in Iran: an application of the combined cointegration approach’, *Resources Policy,* 49(C), pp. 213-221. DOI: 10.1016/j.resourpol.2016.06.005

Aidt, T. (2003) ‘Economic analysis of corruption: a survey’, *The Economic Journal,* 113(491), pp. F632–F652. DOI: 10.1046/j.0013-0133.2003.00171.x

Aidt, T. (2009) ‘Corruption, Institutions, and Economic Development’, *Oxford Review of Economic Policy,* 25(2), pp. 271-291. DOI: 10.1093/oxrep/grp012

Aidt, T., Dutta, J. and Sena, V. (2008) ‘Governance Regimes, Corruption and Growth: Theory and Evidence’, *Journal of Comparative Economics,* 36(2), pp. 195-220. DOI: 10.1016/j.jce.2007.11.004

Aiyar, S. and Feyrer, J, A (2002) ‘*Contribution to the Empirics of Total Factor Productivity*’ Dartmouth College Working Paper No. 02-09. DOI:10.2139/ssrn.325363

Aisen, A. and Veiga, F.J. (2011) ‘How Does Political Instability Affect Economic Growth?’, International Monetary Fund, Working Paper No. 11/12. Available at: https://www.imf.org/external/pubs/ft/wp/2011/wp1112.pdf (Accessed 16 April 2018).

Akacem, M. and Cachanosky, N. (2017) ‘The Myth of the Resource Curse: A Case Study of Algeria’, *SSRN Electronic Journal,* 32(2). DOI: 10.2139/ssrn.2633793

Akinlo, A. E. (2012) ‘How Important is Oil in Nigeria’s Economic Growth?’, *Journal of Sustainable Development*, 5(4), pp. 165 – 179. DOI:10.5539/jsd.v5n4p165

Akinlo, A. and Adejumo, O. (2016) 'Determinants of Total Factor Productivity Growth in Nigeria, 1970–2009', *Global Business Review,* 17(2), pp. 257-270. DOI: 10.1177/0972150915619801

Akpan, G. E. and Chuku, C. (2014) 'Natural Resources, Human Capital and Economic Development in Nigeria: Tracing the Linkages', *Journal of Economics and Sustainable Development,* 5(21), pp. 40-51. Available at: https://pdfs.semanticscholar.org/7633/561fd605c9c9e4e4e636ba42f276bb6c5913.pdf (Accessed: 2 November 2017).

Alan, K. M. A., Altman, Y., and Roussel, J. (2008) 'Employee Training Needs and Perceived Value of Training in the Pearl River Delta of China: A Human Capital Development Approach', *Journal of European Industrial Training,* 32(1), pp. 19-31. DOI:10.1108/03090590810846548

Alesina, A., Ozler, S., Roubini, N. and Swagel, P. (1996) 'Political instability and economic growth', *Journal of Economic Growth,* 1(2), pp. 189–211.

Alesina, A. and Perotti, R. (1996) 'Income distribution, political instability, and investment', *European Economic Review,* 40(6), pp. 1203- 1228. DOI: 10.1016/0014-2921(95)00030-5

Alexeev, M. and Conrad, R. (2009) 'The elusive curse of oil', *Review of Economics and Statistics,* 91(3), pp. 586-598. DOI: 10.1162/rest.91.3.586

Ali, H., and Jabeen, A. (2015) 'Effects of education on economic growth: Evidence from Pakistan', *American Journal of Economics*, Finance and Management, 1(6), pp. 379-585. Available at: http://www.aiscience.org/journal/ajefm (Accessed: 20 January 2018)

Aljarallah, R. and Angus, A. (2019) '*An Analysis of the Impact of Rents from Non-renewable Energy Resources and changes in Human Capital on Institutional Quality: A case Study of Kuwait'*, Manuscript submitted for publication.

Alvi, S. and Ahmed, A. (2014) 'Analyzing the Impact of Health and Education on Total Factor Productivity: A Panel Data Approach', *Indian Economic Review,* 49(1), pp. 109-123. Available at: http://www.jstor.org/stable/24583409 (Accessed:10 December 2017).

Andersen, J. J. and Aslaksen, S. (2008) 'Constitutions and the resource curse', *Journal of Development Economics,* 87(2), pp. 227-246. DOI: 10.1016/j.jdeveco.2007.12.005

Andvig, J.C. and Moene, K.O. (1990) 'How corruption may corrupt', *Journal of Economic Behavior and Organization,* 13(1), pp. 63–76. DOI:10.1016/0167-2681(90)90053-G

Antonakakis, N., Cunado, J., Filis, G., and Gracia, F. P. D. (2017) 'Oil dependence, quality of political institutions and economic growth: A panel VAR approach', *Resources Policy,* 53, pp.147-163. DOI: 10.1016/j.resourpol.2017.06.005

Anthonsen, M., Löfgren, A., Nilsson, K. and Westerlund, J. (2012) 'Effects of rent dependency on quality of government', *Economics of Governance,* 13(2). pp 145–168. DOI 10.1007/s10101-011-0105-3

Apergis, N., El-Montasser, G., Sekyere, E., Ajmi, A.N. and Gupta, R. (2014) 'Dutch disease effect of oil rents on agriculture value added in Middle East and North African (MENA) countries, *Energy Economics*, 45, pp. 485-490. Available at: http://hdl.handle.net/10545/623403 (Accessed: 20 November 2018)

Apergis, N. and Payne, J.E. (2014) 'The oil curse, institutional quality, and growth in MENA countries: evidence from time-varying cointegration', *Energy Economics*, 46, pp.1-9. DOI: 10.1016/j.eneco.2014.08.026

Appiah, E. (2017) 'The Effect of Education Expenditure on Per Capita GDP in Developing Countries', *International Journal of Economics and Finance Archives*, 9(10), pp. 136-144. DOI:10.5539/ijef.v9n10p136

Araji, S.M. and Mohtadi, H. (2018) 'Natural resources, incentives and human capital: reinterpreting the curse', *10th Midwest International Development Conference, Madison*, WI, 2013.

Arezki, R., and Bruckner, M. (2011) 'Oil rents, corruption, and state stability: Evidence from panel data regressions', *European Economic Review*, 55(7), pp. 955-963. DOI: 10.1016/j.euroecorev.2011.03.004

Arezki, R., and Bruckner, M. (2012) 'Resource Windfalls and Emerging Market Sovereign Bond Spreads: The Role of Political Institutions', *The World Bank Economic Review*, 26(1), pp. 78–99, DOI:10.1093/wber/lhr015

Arezki, R., Dupuy, A., and Gelb, A. (2012) '*Resource windfalls, optimal public investment and redistribution: the role of total factor productivity and administrative capacity',* International Monetary Fund, Working Paper WP/12/200. DOI: 10.5089/9781475505504.001

Arezki, R., Hamilton, K. and Kazimov, K. (2011) '*Resource windfalls, macroeconomic stability and growth: The role of political institutions'*, International Monetary Fund, Working Paper 11/142. DOI:10.5089/9781455266432.001

Arezki, R. and Nabli, M. (2012) '*Natural Resources, Volatility, and Inclusive Growth: Perspectives from the Middle East and North Africa'*, International Monetary Fund, Working Paper, WP/12/111. DOI:10.5089/9781475503326.001

Arezki, R. and Van der Ploeg, F. (2007) *'Can the Natural Resource Curse Be Turned into a Blessing? The Role of Trade Policies and Institutions'*, International Monetary Fund, Working Paper No. 07/55. Available at: https://ssrn.com/abstract=969869 (Accessed: 20 November 2018)

Arezki, R. and van der Ploeg, F. (2010) 'Trade policies, institutions and the natural resource curse', *Applied Economics Letters*, 17(15), pp. 1443–1451. DOI:10.1080/13504850903035881

Arezki, R. and Van der Ploeg, F. (2011) 'Do Natural Resources Depress Income Per Capita?', *Review of Development Economics,* 15(3), pp. 504–521. DOI: 10.1111/j.1467-9361.2011.00623.x

Armstrong, M. (2006) '*A Handbook of Human Resource Management Practice'*, 10th ed. London: Kogan Page.

Aron, J. (2000) ‘Growth and Institutions: A Review of the Evidence’, *The World Bank Research Observer*, 15(1), pp. 99-135. DOI: 10.1093/wbro/15.1.99

Asekunowo, V.O. and Olaiya, S.A. (2012) ‘Crude oil revenue and economic development in Nigeria (1974–2008)’, *OPEC Energy Review*, 36(2), pp. 138–169. DOI: 10.1111/j.1753-0237.2011.00205.x

Atkinson, G. and Hamilton, K. (2003) ‘Savings, growth and the resource curse hypothesis’, *World Development,* 31(11), pp.1793-1807. DOI: 10.1016/j.worlddev.2003.05.001

Attila, J.G. (2008) *‘Corruption, Taxation and Economic Growth: Theory and Evidence’*, CERDI Working Paper E 2008.29. DOI: 10.2139/ssrn.2260995

Auty, R. M. (1990) ‘*Resource-Based Industrialization: Sowing the Oil in Eight Developing Countries’*. New York: Oxford University Press.

Auty R. M. (1993) ‘*Sustaining development in mineral economies: The Resource Curse Thesis’.* Routledge, London.

Auty, R. M. (2001) *‘Resource abundance and economic development’.* Oxford: Oxford University Press.

Auty, R.M. (2007) ‘Natural resources, capital accumulation and the resource curse’, *Ecological Economics*, 61(4), pp. 627-634. DOI: 10.1016/j.ecolecon.2006.09.006.

Azfar, O. and Gurgur, T. (2008) ‘Does Corruption Affect Health and Education Outcomes in the Philippines?’, *Economics of Governance,* 9(3), pp. 197-244. DOI:10.1007/s10101-006-0031-y

Badeeb, R. and Lean, H. (2017) ‘Natural Resources and Productivity: Can Banking Development Mitigate the Curse?’, *Economies*, 5(11). DOI:10.3390/economies5020011

Badeeb, R. A., Lean, H.H., and Clark, J. (2017) ‘The evolution of the natural resource curse thesis: A critical literature survey’, *Resources Policy*, 51(March), pp. 123-134. DOI: 10.1016/j.resourpol.2016.10.015

Bah, C. M. (2016) ‘Economic Growth, Institutions, and the Natural Resource Curse in Sierra Leone: An Empirical Investigation’, *International Journal of Business and Social Science,* 7(5), pp. 100-124. Available at: http://www.ijbssnet.com/journals/Vol_7_No_5_May_2016/10.pdf (Accessed: 21 May 2018)

Bakwena, M. (2012) ‘Is it true that good institution alleviates the resource curse? A re-assessment of existing OLS cross country evidence’, *Botswana Journal of Economics*. 10(14). Abailable at: https://www.ajol.info/index.php/boje/article/viewFile/85406/75331(Accessed: 21 January 2018)

Baland, J. M. and Francois, P. (2000) ‘Rent-seeking and resource booms’, *Journal of Development Economics,* 61(2), pp. 527-542. DOI: 10.1016/S0304-3878(00)00067-5

Banafea, W. and Ibnrubbian, A. (2018) ‘Assessment of economic diversification in Saudi Arabia through nine development plans’, *OPEC Energy Review,* 42(1), pp. 42-54. DOI: 10.1111/opec.12116

Barakat, S. and Skelton, J. (2014) *‘The Reconstruction of Post-war Kuwait: A Missed Opportunity?’*, Research Paper, Kuwait Programme on Development, Governance and Globalisation in the Gulf States. Available at: http://eprints.lse.ac.uk/55337/1/Barakat_Skelton_2014.pdf (Accessed: 21 May 2019)

Bardhan, P. (1997) ‘Corruption and Development: A Review of Issues’, *Journal of Economic Literature,* 35(3), pp.1320-1346. Available at: https://www.jstor.org/stable/2729979 (Accessed: 2 November 2018)

Barrett, A. and O’Connell, P.J. (1999) ‘Does Training Generally Work? The Returns to In-Company Training’, *Industrial and Labor Relations Review,* 54(3), pp. 647-662. DOI: 10.2307/2695995

Barro, R. J. (1991) ‘Economic Growth in a Cross Section of Countries’, *The Quarterly Journal of Economics,* 106(2), pp. 407-443. DOI: 10.2307/2937943

Barro R. J. (1997) ‘Determinants of Economic Growth: A Cross-Country Empirical Study’. Cambridge: MIT Press.

Barro, R.J. (2001) ‘Human Capital and Growth’, *American Economic Association,* 91(2), pp. 12-17. DOI: 10.1257/aer.91.2.12

Barro, R. J. and Sala-i-Martin, X. (1997) ‘Technological Diffusion, Convergence, and Growth’, *Journal of Economic Growth*, 2(1), pp. 1-26. Available at: Handle: *RePEc:kap:jecgro:v:2:y:1997:i:1:p:1-26* (Accessed: 2 December 2017).

Barro, R. J. and Lee, J.W. (2013) ‘A new data set of educational attainment in the world 1950-2010’, *Journal of Development Economics*, 104(C), pp. 184–198. DOI: 10.1016/j.jdeveco.2012.10.001

Bassanini, A. and Scarpetta,S. (2002) ‘Does human capital matter for growth in OECD countries? A pooled mean-group approach’, *Economics Letters,* 74(3), pp. 399-405. DOI: 10.1016/S0165-1765(01)00569-9

Bauer, P.W., Schweitzer, M.E., and Shane, S.A. (2006) ‘*State Growth Empirics: The Long-Run Determinants of State Income Growth’,* FRB of Cleveland Working Paper No. 06-06. Available at SSRN: http://ssrn.com/abstract=1022341 (Accessed: 29 January 2018).

Becker, G. (1962) ‘Investment in Human Capital: A Theoretical Analysis’, *Journal of Political Economy,* 70(5), pp. 9-49. Available at: https://www.jstor.org/stable/1829103 (Accessed: 20 September 2018).

Becker, G. S. (1964) *‘Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education’*. New York: Columbia University Press.

Beets, S. D. (2005) ‘Understanding the Demand-Side Issues of International Corruption’, *Journal of Business Ethics*, 57(1), pp. 65-81. DOI: 10.1007/s10551-004-3824-3

Behbudi, D., Mamipour, S. and Karami, A. (2010) ‘Natural resource abundance, human capital and economic growth in the petroleum exporting countries’, *Journal of Economic Development,* 35(3), pp. 81-102. Available at: http://www.jed.or.kr/full-text/35-3/4.pdf (Accessed: 2 November 2018)

Beland, L. and Tiagi, R. (2009) ‘*Economic freedom and the resource curse: An empirical analysis’*, Available at: https://www.fraserinstitute.org/sites/default/files/EconomicFreedomandResourceCurse_1.pdf (Accessed: 3 November 2018).

Bencivenga, V.R. and Smith, B.D. (1991) ‘Financial intermediation and endogenous growth’, *The Review of Economic Studies*, 58(2), pp. 195-209. DOI: 10.2307/2297964

Benhabib, J. and Spiegel, M. (1994) ‘The role of human capital in economic development: Evidence from aggregate cross-country and regional US data’, *Journal of Monetary Economics*, 34(2), pp. 143-173. DOI: 10.1016/0304-3932(94)90047-7

Ben-Porath, Y. (1967) ‘The Production of Human Capital and the Life Cycle of Earnings’, *The Journal of Political Economy*, 75(4), pp. 352—365. DOI:10.1086/259291

Ben-salha, O., Dachraoui, H. and Sebri, M. (2018) ‘Natural resource rents and economic growth in the top resource-abundant countries: A PMG estimation, *Resources Policy,* In Press, Corrected Proof. DOI:10.1016/j.resourpol.2018.07.005

Bensi, M.T., Black, D. C., and Dowd, M.R. (2004) ‘The Education/Growth Relationship: Evidence from Real State Panel Data’ *Contemporary Economic Policy*, 22(2), pp. 281-298. DOI: 10.1093/cep/byh020

Berlemann, M. and Wesselhoft, JE. (2016) ‘Estimating aggregate capital stocks using the perpetual inventory method: A Survey of Previous Implementations and New Empirical Evidence for 103 Countries’, *Review of Economics*, *65*(1), pp. 1-34. DOI:10.1515/roe-2014-0102

Bernard, A. and Jones, C. (1996) ‘Productivity across Industries and Countries: Time Series Theory and Evidence’, *The Review of Economics and Statistics*, 78(1), pp. 135-46. DOI: 10.2307/2109853

Besley, T. and Persson, T. (2014) ‘Why Do Developing Countries Tax So Little?’, *Journal of Economic Perspectives*, 28(4), pp. 99-120. DOI: 10.1257/jep.28.4.99

Bhattacharyya, S. and Collier, P. (2014) ‘Public capital in resource rich economies: is there a curse?’, *Oxford Economic Papers*, 66(1), pp. 1-24, DOI:10.1093/oep/gps073

Bhattacharyya, S. and Hodler, R. (2010) ‘Natural Resources, Democracy and Corruption’, *European Economic Review*. 54(4), pp. 608–621.

Bhattacharyya, S. and Hodler, R. (2014) ‘Do natural resource revenues hinder financial development? The role of political institutions’, World Development, 57, pp. 101-113. DOI: 10.1016/j.worlddev.2013.12.003

Bils, M. and Klenow, P.J. (2000) ‘Does Schooling Cause Growth?’, *American Economic Review*, 90(5), pp. 1160-1183. DOI: 10.1257/aer.90.5.1160

Birdsall, N. and Hamoudi, A. (2002) *‘Commodity dependence, trade, and growth: when ‘‘Openness'' is not enough’,* Working Paper No. 7. Center for Global Development, Washington, DC. DOI: 10.2139/ssrn.999988

Birdsall N., Kelley A. C., and Sinding S. W. (2001a) *‘Why population matters: demographic change, economic growth, and poverty in the developing world’*. Oxford: Oxford University Press.

Birdsall, N., Pinckney, T. and Sabot R. (2001b) ‘Natural Resources, Human Capital, and Growth’, in Auty, R. (ed.) *Resource Abundance and Economic Growth’*. Oxford: Oxford University Press. pp. 57-75.

Bjorvatn, K. and Selvik, K. (2008) ‘Destructive Competition: Factionalism and Rent-Seeking in Iran’, *World Development*, 36(11), pp. 2314-2324. DOI: 10.1016/j.worlddev.2007.11.002

Bjorvatn, K., Farzanegan, M. R. and Schneider, F. (2012) ‘Resource Curse and Power Balance: Evidence from Oil-Rich Countries’, *World Development*. 40(7), pp. 1308–1316. DOI: 10.1016/j.worlddev.2012.03.003

Blanco, L. and Grier, R. (2012) ‘Natural Resource Dependence and the Accumulation of Physical and Human Capital in Latin America’, *Resources Policy,* 37(3), pp. 281–295. DOI:10.1016/j.resourpol.2012.01.005

Blankenau, W., Simpson, N. B. and Tomljanovich, M. (2007) ‘Public Education Expenditures, Taxation, and Growth: Linking Data to Theory’, *American Economic Review*, 97(2), pp. 393-397. DOI: 10.1257/aer.97.2.393

Boschini, A. D., Pettersson, J. and Roine, J. (2007) ‘Resource Curse or Not: A Question of Appropriability’, *The Scandinavian Journal of Economics*, 109(3), pp. 593–617. DOI: 10.1111/j.1467-9442.2007.00509.x

Boschini, A., Pettersson, J. and Roine, J. (2013) ‘The resource curse and its potential reversal’, *World Development*, 43(C), pp. 19-41. DOI: 10.1016/j.worlddev.2012.10.007

Bose, N., Haque, M. E., and Osborn, D. R. (2007) ‘Public expenditure and economic growth: A disaggregated analysis for developing countries,’ *The Manchester School*, 75(5), pp. 533–556. DOI: 10.1111/j.1467-9957.2007.01028.x

Bosworth, B. P. and Collins, S. M. (2003) ‘The empirics of growth: An update’, *Brookings Papers on Economic Activity*, 34(2), pp. 113–206.

Boyce, J.R. and Emery, J.H. (2011) ‘Is a negative correlation between resource abundance and growth sufficient evidence that there is a "resource curse"?’, *Resources Policy*, 36(1), pp. 1-13. Available at: https://EconPapers.repec.org/RePEc:eee:jrpoli:v:36:y:2011:i:1:p:1-13 (Accessed: 15 November 2018)

Braun, M. and Di Tella, R. (2004) ‘Inflation Variability, and Corruption’, *Economics & Politics*, 16(1), pp. 77-100. Available at SSRN: https://ssrn.com/abstract=513529 (Accessed: 2 December 2017).

Brockwell, P. and Davis, R. (2002) ‘*Introduction to Time Series and Forecasting’.* Switzerland: Springer.

Bruckner, M. and Gradstein, M. (2013) *‘Income and Schooling’*. Discussion Paper 9365. Washington, DC: CEPR. Available at: http://www.cepr.org/active/publications/discussion_papers/dp.php?dpno=9365 (Accessed: 20 March 2019)

Brunnschweiler, C. N. (2008) ‘Cursing the blessings? Natural resource abundance, institutions, and economic growth’, *World development, 36*(3), pp. 399-419. DOI:10.1016/j.worlddev.2007.03.004

Brunnschweiler, C. N. and Bulte, E. H. (2008) ‘The resource curse revisited and revised: A tale of paradoxes and red herrings’, *Journal of environmental economics and management*, *55*(3), pp. 248-264. DOI:10.1016/j.jeem.2007.08.004

Bulte, E., Damania, R. and Deacon, R. (2003) *‘Resource abundance, poverty and development’*, The Food and Agriculture Organization of the United Nations ESA Working Paper No. 04-03. Available at: https://escholarship.org/uc/item/66z854gv (Accessed: 10 March 2018)

Bulte, E., Damania, R. and Deacon, R. (2005) ‘Resource Intensity, Institutions, and Development’, *World Development*, 33(7), pp. 1029–1044. DOI: 10.1016/j.worlddev.2005.04.004

Burgess, R., Hansen, M., Olken, B. A., Potapov, P. and Sieber, S. (2012) ‘The political economy of deforestation in the tropics’, *The Quarterly Journal of Economics*, 127(4), pp. 1707-1754. DOI:10.1093/qje/qjs034

Burnham, K. P. and Anderson, D. R. (2004) ‘Multimodel inference: understanding AIC and BIC in model selection’, *Sociological methods & research*, 33(2), pp. 261-304. DOI:10.1177/0049124104268644

Busse, M. and Groening, S. (2013) ‘The resource curse revisited: governance and natural resources’, *Public Choice*, 154(1-2), pp 1–20. DOI: 10.2139/ssrn.1634963

Butkiewicz, J. L. and Yanikkaya, H. (2006) ‘Institutional quality and economic growth: Maintenance of the rule of law or democratic institutions, or both?’, *Economic Modelling*, 23(4), pp. 648-661. DOI:10.1016/j.econmod.2006.03.004

Butkiewicz, J.L. and Yanikkaya, H. (2010) ‘Minerals, institutions, openness, and growth: an empirical analysis’, *Land Economics,* 86(2), pp. 313-328. DOI: 10.3368/le.86.2.313

Cabrales, A. and Hauk, E. (2011) 'The Quality of Political Institutions and the Curse of Natural Resources', *The Economic Journal*, 121(551), pp. 58 – 88. DOI: 10.1111/j.1468-0297.2010.02390.x

Cameron G. (1998) 'Economic growth in the information age: From physical capital to weightless economy', *Journal of Informational Affairs*, 51(2), pp. 447–471. Available at: https://www.jstor.org/stable/24357508 (Accessed: 10 November 2018)

Carmignani, F. (2013) 'Development outcomes, resource abundance, and the transmission through inequality', *Resource and Energy Economics*, 35(3), pp. 412-428. DOI:10.1016/j.reseneeco.2013.04.007

Carmignani, F. and Avom, D. (2010) 'The social development effects of primary commodity export dependence', *Ecological Economics*, 70(2), pp.317-330. DOI: 10.1016/j.ecolecon.2010.09.003

Caselli, F. (2005) 'Accounting for Cross-Country Income Differences', in Aghion, P. and Durlauf, S. (eds.) *Handbook of Economic Growth*, 1stedn, 1(A), pp. 679-741. Available at: https://personal.lse.ac.uk/casellif/papers/handbook.pdf (Accessed: 5 November 2018)

Caselli, F. and Cunningham, T. E. (2009) 'Leader Behaviour and the Natural Resource Curse', *Oxford Economic Papers*, 61(4), pp. 628-650. DOI: 10.1093/oep/gpp023

Castello-Climent, A. (2008) 'On the distribution of education and democracy', *Journal of Development Economics*, 87 (2), pp. 179-190. DOI: 10.1016/j.jdeveco.2007.10.006

Cavalcanti, T, Mohaddes, K. and Raissi, M. (2011) 'Growth, development and natural resources: new evidence using a heterogeneous panel analysis', *The Quarterly Review of Economics and Finance,* 51(4), pp. 305-318. DOI: 10.1016/j.qref.2011.07.007

Cavusoglu, T. and Onal, D. K. (2016) 'The Role of Institutional Quality on Total Factor Productivity: A Comparative Analysis on the CEE and MENA Economies', in Erdoğdu, M. M. and Bryan Christiansen, B. (eds.) *Handbook of Research on Comparative Economic Development Perspectives on Europe and the MENA Region*, Hershey, PA: IGI Global, pp. 98-126.

Central Intelligence Agency, CIA (2018) '*The World Factbook'*. Available at: https://www.cia.gov/library/publications/resources/the-world-factbook/ (Accessed: 20 June 2019).

Cervellati, M. and Sunde, U. (2002) 'Human Capital Formation, Life Expectancy and the Process of Economic Development', *American Economic Review*, *95*(5), pp. 1653-1672. Available at: https://www.jstor.org/stable/4132770 (Accessed: 2 May 2019).

Chen, S. (2012) 'Natural Resource Curse, Total Factor Productivity and Regional Disparity in China: Based on Dynamic Panel Data Model Analysis', *International Journal of Economic Policy Studies*, 7(1), pp. 1-30. DOI: 10.1007/BF03405735

Cheung, C. K. and Chan, R. K. H. (2008) 'Facilitating achievement by social capital in Japan', *Journal of Behavioral and Experimental Economics,* 37(6), pp. 2261–2277.

Cheung, H. Y. and Chan, A. W.H. (2008) ‘Corruption Across Countries; Impacts form Education and Cultural Dimensions’, *The Social Science Journal,* 45(2), pp. 223-239. DOI: 10.1016/j.soscij.2008.03.002

Chimezie, N. B. and Prince O., N. (2016) ‘Effects of Corruption on Educational System: A Focus on Private Secondary Schools in Nsukka Zone’, *Global Journal of Human-Social Science: A,* 16(5), pp. 59-67.

Chong, A. and Calderon, C. (2000) ‘Causality and Feedback between Institutional Measures and Economic Growth’, *Economics and Politics,* 12(1), pp. 69-81. DOI:10.1111/1468-0343.00069

Ciccone, A. and Papaioannou, E. (2009) ‘Human Capital, the Structure of Production, and Growth’, *Review of Economics and Statistics*, 91(1), pp. 66-82. DOI: 10.1162/rest.91.1.66

Cockx, L. and Francken, N. (2014) ‘Extending the concept of the resource curse: natural resources and public spending on health’, *Ecological Economics* 108(December), pp. 136-49. DOI: 10.1016/j.ecolecon.2014.10.013

Cockx, L. and Francken, N. (2016) ‘Natural resources: a curse on education spending?’, *Energy Policy*, 92(C), pp. 394-408. DOI: 10.1016/j.enpol.2016.02.027

Coe, D.T., Helpman, E. and Hoffmaister, A.W. (2009) ‘International R&D spill overs and institutions’, *European Economic Review*, 53 (7), pp. 723-741. DOI:10.1016/j.euroecorev.2009.02.005

Cohen, D. and Soto, M. (2007) ‘Growth and human capital: good data, good results’, *Journal of Economic Growth*, 12(1), pp. 51-76. DOI 10.1007/s10887-007-9011-5

Cole, M. A. and Neumayer, E. (2006) ‘The impact of poor health on factor productivity: an empirical investigation’, *Journal of development studies*, 42(6). pp. 918-938. DOI: 10.1080/00220380600774681

Collier, P. and Goderis, B. (2008) *‘Commodity Prices, Growth, and the Natural Resource Curse: Reconciling a Conundrum’*, MPRA Working Paper No. 17315. DOI:10.2139/ssrn.1473716

Collier, P. and Goderis, B. (2012) ‘Commodity prices and growth: An empirical investigation’, *European Economic Review,* 56(6), pp. 1241-1260. DOI: 10.1016/j.euroecorev.2012.04.002

Collier, P. and Hoeffler, A. (2005) ‘Resource Rents, Governance, and Conflict’, *Journal of Conflict Resolution*, 49(4), pp. 625-633. DOI: 10.1177/0022002705277551

Collier, P. and Hoeffler, A. (2009) ‘Testing the neocon agenda: democracy in resource-rich societies’, *European Economic Review,* 53(3), pp. 293-308. DOI: 10.1016/j.euroecorev.2008.05.006

Collier, P., Hoeffler, A. and Soderborn, M. (2004) ‘On the Duration of Civil War’, *Journal of Peace Research,* 41(3), pp. 253-273. DOI:10.1177/0022343304043769

Collins, S. M., Bosworth, B. P., and Rodrik, D. (1996) ‘Economic growth in East Asia: accumulation versus assimilation’, *Brookings papers on economic activity*, 1996(2), pp.135-203.

Comin, D. (2017) ‘Total factor productivity’, in Macmillan Publishers Ltd (ed.) *The New Palgrave Dictionary of Economics.* London, Palgrave Macmillan, pp. 1-4.

Conti, G., Heckman, J. and Urzua.S. (2010) ‘The Education-Health Gradient’, *American Economic Review,* 100(2), pp. 234-38. DOI: 10.1257/aer.100.2.234

Corden, W. M. (1984) ‘Booming Sector and Dutch Disease Economics: Survey and Consolidation’, *Oxford Economic Papers,* 36(3), pp.359–380. Available at: http://www.jstor.org/stable/2662669 (Accessed: 9 November 2018)

Corden, W.M. and Neary, J. P. (1982) ‘Booming Sector and De-Industrialization in a Small Open Economy’, *The Economic Journal*, 92(368), pp. 825–848. DOI: 10.2307/2232670

Costa, H. and Santos, E. (2013) ‘Institutional analysis and the resource curse in developing countries’, *Energy Policy,* 63(C), pp. 788-795. DOI: 10.1016/j.enpol.2013.08.060

Costantini, V. and Monni, S. (2008) ‘Environment, human development and economic growth’, *Ecological Economics,* 64(4), pp. 867-880. DOI: 10.1016/j.ecolecon.2007.05.011

Cotet, A. M., and Tsui. K. K. (2013) ‘Oil and Conflict: What Does the Cross-Country Evidence Really Show?’, *American Economic Journal: Macroeconomics*, 5(1), pp. 49-80. DOI: 10.1257/mac.5.1.49

Coulombe, S. and Tremblay, J. F. (2006) ‘Literacy and growth’, *The B.E. Journal of Macroeconomics,* 6(2), pp. 1-34.

Crivelli, E. and Gupta, S. (2014) ‘Resource blessing, revenue curse? Domestic revenue effort in resource-rich countries’, *European Journal of Political Economy,* 35, pp. 88-101. DOI: 10.1016/j.ejpoleco.2014.04.001

Crowther, D. and Lancaster, G. (2008) ‘*Research Methods: A Concise Introduction to Research in Management and Business Consultancy’*. Abingdon: Routledge.

Dalgaard, C. and Olsson, O. (2008) ‘Windfall gains, political economy and economic development’, *Journal of African Economies,* 17(233), pp. 72-109. DOI: 10.1093/jae/ejm033}

Daniele, V. (2011) ‘Natural resources and economic growth: a curse or a blessing?’, *Rivista Italiana degli Economisti,* 16(3), pp. 507-528. Available at SSRN: https://ssrn.com/abstract=2012298 (Accessed: 3 January 2019).

Dasgupta, P. and Ray, D. (1991) ‘Adapting to Undernourishment: The Biological Evidence and Its Implications’, in Dreze, J. and Sen, A. K. (eds.), *The Political Economy of Hunger* Oxford: Clarendon Press.

Dasgupta, D., Keller, J. and Srinivasan, T.G. (2005) ‘*Reform and elusive growth in the Middle East - What has happened in the 1990s?’,* Middle East and North Africa Working Paper no. 25. Washington, D.C: The World Bank. Available at:

http://documents.worldbank.org/curated/en/892651468776955775/Reform-and-elusive-growth-in-the-Middle-East-What-has-happened-in-the-1990s (Accessed: 13 December 2018).

Davis, G. (1995) 'Learning to love the Dutch disease: Evidence from the Mineral Economies', *World Development,* 23(10), pp.1765-79. DOI: 10.1016/0305-750X(95)00071-J

De Haan, J. and Sturm, J. (2000) 'On the Relationship Between Economic Freedom and Economic Growth', *European Journal of Political Economy,* 16(2), pp. 215-241. DOI: 10.1016/S0176-2680(99)00065-8

Delalibera, B. R. and Ferreira, P. C. (2019) 'Early childhood education and economic growth', *Journal of Economic Dynamics and Control,* 98(C), pp. 82-104. DOI: 10.1016/j.jedc.2018.10.002

De Mello, L. and Dutz, M.A. (2012), *'Promoting inclusive growth: Challenges and policies',* Paris: OECD and the World Bank.

De Rosa, D. and Lootty, M. (2012) '*Are Natural Resources Cursed? An Investigation of the Dynamic Effects of Resource Dependence on Institutional Quality*', World Bank, Policy Research Working Paper 6151. DOI:10.1596/1813-9450-6151

Di John, J. (2011) 'Is There Really a Resource Curse? A Critical Survey of Theory and Evidence', *Global Governance,* 17(2), pp. 167-184. Available at: https://www.jstor.org/stable/23033728 (Accessed: 12 February 2018).

Dias, J. and Tebaldi, E. (2012) 'Institutions, human capital, and growth: The institutional mechanism', *Structural Change and Economic Dynamics,* 23(3), pp. 300–312. DOI: 10.1016/j.strueco.2012.04.003

Dietz, S., Neumayer, E. and De Soysa, I. (2007) 'Corruption, the resource curse and genuine saving', *Environment and Development Economics,* 12(01), pp. 33-53 DOI: 10.1017/S1355770X06003378

Ding, N. and Field, B. (2005) 'Natural Resource Abundance and Economic Growths', *Land Economics,* 81(4), pp. 496-502. DOI: 10.3368/le.81.4.496

Dollar, D. and Kraay, A. (2000) *'Property Rights, Political Rights, and the Development of Poor Countries in the Post-Colonial Period'*, World Bank Working Papers. Available at: https://pdfs.semanticscholar.org/1c99/9f6ea63804a621716bbbd79b31ec368373cc.pdf (Accessed: 20 October 2018).

Dollar, D. and Kraay, A. (2001) '*Growth is good for the poor',* World Bank Policy Research Working Paper No. 2587. DOI:10.1596/1813-9450-2587.

Douangngeune, B., Hayami, Y. and Godo, Y. (2005) 'Education and natural resources in economic development: Thailand compared with Japan and Korea', *Journal of Asian Economics,* 16(2), pp. 179-204. DOI: 10.1016/j.asieco.2004.12.004

Douglas, S. and Walker, A. (2017) 'Coal Mining and The Resource Curse in The Eastern United States', *Journal of Regional Science,* 57(4), pp. 568-590. DOI: 10.2139/ssrn.2385560

Driouchi, A. (2014) *'Testing of Natural Resources as Blessing or Curse to the Knowledge Economy in Arab Countries',* MPRA Paper No. 58598. Available at: http://mpra.ub.uni-muenchen.de/58598/ (Accessed: 12 March 2019)

Du Plessis, S. and Du Plessis, S. (2006) 'Explanations for Zambia's economic decline', *Development Southern Africa*, 23(3), pp. 351–369. DOI: 10.1080/03768350600843069

Easterly, W. and Levine, R. (2001) 'It's Not Factor Accumulation: Stylized Facts and Growth Models', *The World Bank Economic Review,* 15(2), pp. 177-219.

Easterly, W and Levine, R. (2003) 'Tropics, germs, and crops: how endowments influence economic development', *Journal of Monetary Economics,* 50(1), pp. 3-39. DOI:10.1016/S0304-3932(02)00200-3

Ehrlich, I and Lui, F.T. (1999) 'Bureaucratic corruption and endogenous economic growth', *Journal of Political Economy,*107(6), pp. S270-S293. DOI: 10.1086/250111

Ehteshami, A. and Wright, S. (2007) 'Political Change in the Arab Oil Monarchies: From Liberalization to Enfranchisement', *International Affairs (Royal Institute of International Affairs 1944)*, 83(5), pp. 913-932. https://www.jstor.org/stable/4541861 (Accessed: 18 October 2018).

El Anshasy, A. A. and Katsaiti, M.S. (2013) 'Natural resources and fiscal performance: Does good governance matter?', *Journal of Macroeconomics*, 37(September). pp. 285–298. DOI: 10.1016/j.jmacro.2013.05.006

Elbadawi, I. A. and Soto, R. (2015) 'Resource rents, institutions, and violent civil conflicts', *Defense and Peace Economics*, 26(1), pp. 89-113. DOI: 10.1080/10242694.2013.848579

El-Katiri, L., Fattouh, B., and Segal, P. (2011) 'Anatomy of an Oil-Based Welfare State: Rent Distribution in Kuwait', London: London School of Economics. Available at: http://www.lse.ac.uk/LSEKP/. (Accessed: 2 Feb 2019).

Engerman, S. L. and Sokoloff, K. L. (2002) 'Factor Endowments, Inequality, and Paths of Development among New World Economies', *Economia*, 3(1), pp. 41-88. DOI: 10.1353/eco.2002.0013

Eregha, P.B. and Mesagan, E. (2016) 'Oil resource abundance, institutions and growth: Evidence from oil producing African countries', *Journal of Policy Modeling*, 38 (3), pp. 603-619. DOI: 10.1016/j.jpolmod.2016.03.013

Fallatah, Y. A., Farooqi, A. H. and Shalhoob, S. A. (2019) 'A Perspective of the Shari'ah Compliant Corporate Governance of Financial Institutions in Saudi Arabia and Agency Structures', in in Toseef AzidAli Abdullah AlnodelMuhamad Azeem Qureshi (eds.) *Research in Corporate and Shari'ah Governance in the Muslim World: Theory and Practice,* pp. 287-303. Bradford: Emerald Publishing.

Farhadi, M., Islam,M. and Moslehi, S. (2015) 'Economic Freedom and Productivity Growth in Resource-rich Economies', *World Development,* 72(C), pp. 109-126. DOI: 10.1016/j.worlddev.2015.02.014

Faria, H., Montesinos-Yufa, H., Morales, D. and Navarro, C. (2016) 'Unbundling the roles of human capital and institutions in economic development', *European Journal of Political Economy,* 45(S), pp. 108-128. DOI:10.1016/j.ejpoleco.2016.08.001

Faruq, H. and Taylor, A. (2011) 'Quality of Education, Economic Performance and Institutional Environment', *International Advances in Economic Research*, 17(2), pp. 224-235. DOI: 10.1007/s11294-011-9293-4

Fattouh, B., and El-Katiri, L. (2012a) '*Energy subsidies in the Arab world* (Arab Human Development Report Research Paper Series)', United Nations Development Programme. Available at: http://www.arab-hdr.org/publications/ other/ahdrps/Energy%20Subsidies-Bassam%20Fattouh-Final.pdf (Accessed: 24 January 2019)

Fattouh, B., and El-Katiri, L. (2012b) '*Energy and Arab economic development* (Arab Human Development Report Research Paper Series)', United Nations Development Programme. Available at: http://www.arab-hdr.org/publications/ other/ahdrps/ENGFattouhKatiriV2.pdf (Accessed: 24 January 2019)

Federal Reserve Bank of St. Louis FRED, (2018) 'Economic Research'. Available at: https://fred.stlouisfed.org. (Accessed: 13 June 2019).

Feenstra, R. C., Inklaar, R. and Timmer, M. P. (2015) 'The Next Generation of the Penn World Table', *American Economic Review,* 105(10), pp. 3150-3182, Available at: www.ggdc.net/pwt (Accessed: 29 December 2017).

Filmer, D., De la Brière, B., Ringold, D., Rohner, D., Samuda, K. and Denisova, A. (2017) *'Human Capital in Resource-Rich Countries: From Mines and Wells to Well-Built Minds: Turning Sub-Saharan Africa's Natural Resource Wealth into Human Capital',* World Bank, Washington, DC. DOI: 10.1596/978-1-4648-1005-3_ch1

Fischer S. (1993) 'The role of macroeconomic factors in growth', *Journal of Monetary Economics,* 32(3), pp. 485–512. DOI: 10.3386/w4565

Fitzsimons P. (2017) 'Human Capital Theory and Education', in Peters, M. A. (ed.) *Encyclopedia of Educational Philosophy and Theory,* Singapore: Springer, Chapter 76. DOI: 10.1007/978-981-287-588-4_331

Forbes (2019) '*Saudi Arabia'*. Available at: http://www.forbes.com/places/saudi-arabia/. (Accessed: 20 June 2019)

Fox, J. (2000) *'Civil society and political accountability: propositions for discussion', Santa Cruz,* University of California (mimeo.).

Frank, R. H., and Bernanke, B. S. (2007) '*Principles of Microeconomics (3rd ed.)*', McGraw-Hill/Irwin: New York.

Frankel, J. (2012) '*The natural resource curse: A survey of diagnoses and some prescriptions',* HKS Faculty Research Working Paper Series RWP12-014, John F. Kennedy School of Government, Harvard University. Available at: http://nrs.harvard.edu/urn-3:HUL.InstRepos:8694932 (Accessed: 20 January 2017)

Frechette, G. R. (2006) '*A Panel Data Analysis of the Time-Varying Determinants of Corruption',* CIRANO Working Papers No. 2006s-28. Available at: http://www.cirano.qc.ca/files/publications/2006s-28.pdf (Accessed: 20 November 2017).

Galor, O., Moav, O. and Vollrath, D. (2009) 'Inequality in landownership, the emergence of human-capital promoting institutions, and the great divergence', *Review of Economic Studies,* 76(1), pp. 143-179. DOI: 10.1111/j.1467-937X.2008.00506.x

Garavan, T.N., Morley, M., Gunnigle, P. and Collins, E. (2001) 'Human capital accumulation: the role of human resource development', *Journal of European Industrial Training,* 25(2/3/4), pp. 48-68. DOI: 10.1108/EUM0000000005437

Gatti, R., Morgandi, M., Grun, R., Brodmann, S., Angel-Urdinola, D., Moreno, J.M., Marotta, D., Schiffbauer, M., and Mata Lorenzo, E. (2013) *'Jobs for Shared Prosperity: Time for Action in the Middle East and North Africa',* Washington, DC: World Bank. Available at: http://hdl.handle.net/10986/13284 (Accessed: 20 May 2018).

Gelb, A. (1988). '*Windfall Gains: Blessing or Curse?'.* New York: Oxford University Press.

Gelb, A. (2010) 'Economic Diversification in Resource Rich Countries' [Lecture], *Natural resources, finance, and development: Confronting Old and New Challenges*. The Central Bank of Algeria and the IMF Institute in Algiers. 4-5 November 2010.

Gennaioli, N., LaPorta, R., Lopez-de-Silanes, F. and Shleifer, A. (2013) 'Human Capital and Regional Development', *The Quarterly Journal of Economics,* 128(1), pp. 105-164. DOI:10.1093/qje/qjs050.

Gilberthorpe, E. and Papyrakis, E. (2015) 'The extractive industries and development: the resource curse at the micro, meso and macro levels', *The Extractive Industries and Society,* 2(2), pp. 381-390. DOI:10.1016/j.exis.2015.02.008

Glaeser, E. L, La Porta, R., Lopez-de-silanes, F. and Shleifer, A. (2004) 'Do institutions cause growth?', *Journal of Economic Growth*, 9(1), pp. 271-303. DOI: 10.2139/ssrn.556370

Godwin, E. A. and Chuka, C. (2014) 'Natural Resources, Human Capital, and Economic Development in Nigeria: Tracing the Linkages', *Journal of Economics and Sustainable Development,* 5(21), pp.35–52. Available at: https://pdfs.semanticscholar.org/7633/561fd605c9c9e4e4e636ba42f276bb6c5913.pdf (Accessed: 20 February 2018)

Gould, D.J. (1991) 'Administrative Corruption: Incidence, Causes, and Remedial Strategies', in Farazmand, A. (ed.) *Handbook of Comparative and Development Public Administration*. New York: Marcel Dekker, pp.467-480.

Gould, D.J. and Amaro-Reyes, J.A. (1985) '*The Effects of Corruption on Administrative Performance: Illustrations from Developing Countries'*, World Bank Staff Paper No.580. Washington, DC.: The World Bank. Available at: http://documents.worldbank.org/curated/en/799981468762327213/The-effects-of-corruption-on-administrative-performance-illustrations-from-development-countries (Accessed: 20 May 2019).

Gregorio, J. and Lee, J. (2002) ‘Education and Income Inequality: New Evidence from Cross-Country Data’, *Review of Income and Wealth*, 48(3), pp. 395-416. DOI:10.1111/1475-4991.00060

Griliches, Z. (1992) ‘The search for R&D spillovers’, *Scandinavian Journal of Economics,* 94(Supplement), pp. 29–47. DOI: 10.2307/3440244

Gwartney, J., Holcombe, R. and Lawson, R. (2004) ‘Economic Freedom, Institutional Quality, and Cross-Country Differences in Income and Growth’, *Cato Journal*, 24(3), pp. 205-233. Available at: http://www.cato.org/sites/cato.org/files/serials/f ... 2004/11/cj24n3-2.pdf (Accessed: 4 October 2018).

Gyimah-Brempong, K. (2002) ‘Corruption, Economic Growth, and Income Inequality in Africa’, *Economics of Governance,* 3(3), pp.183-209. DOI: 10.1007/s101010200045

Gylfason, T. (2001) ‘Natural resources, education, and economic development’, *European Economic Review,* 45(5), pp. 847-859. DOI: 10.1016/S0014-2921(01)00127-1

Gylfason, T. (2003) ‘Nature, power and growth’, *Scottish Journal of Political Economy,* 48(5), pp. 558-588. DOI: 10.1111/1467-9485.00215

Gylfason, T., (2003) ‘Resources, Agriculture, and Economic Growth in Economies in Transition’, *Kyklos*, 53(4), pp. 545-579. DOI:10.1111/1467-6435.00133

Gylfason, T. and Zoega, G. (2006) ‘Natural Resources and Economic Growth: The Role of Investment’ *World Economy,* 29(8), pp. 1091–1115. DOI: 10.1111/j.1467-9701.2006.00807.x

Gylfason, T., Herbertsson, T. and Zoega, G. (1999) ‘A mixed blessing: Natural resources and economic growth’, *Macroeconomic Dynamics,* 3(2), pp. 204-225. DOI: 10.1017/S1365100599011049

Haapanen, L. and Tapio, P. (2016) ‘Economic growth as phenomenon, institution and ideology: a qualitative content analysis of the 21st century growth critique’, *Journal of Cleaner Production,* 112(4), pp. 3492-3503. DOI: 10.1016/j.jclepro.2015.10.024

Hall B. and Kramarz F. (1998) ‘Introduction: Effects of technology and innovation on firm performance, employment, and wages’, *Economics of Innovation and New Technology,* 5(2–4), pp. 99–107. DOI:10.1080/10438599800000001

Hall, R. E. and Jones, C. I. (1999) ‘Why do Some Countries Produce So Much More Output Per Worker than Others?’, *The Quarterly Journal of Economics*,114(1), pp. 83-116. Available at: http://www.jstor.org/stable/2586948 (Accessed: 10 November 2018).

Hall, S. and Ahmad, M. (2014) ‘Revisiting the institutions–growth nexus in developing countries: The new evidence’, *New Zealand Economic Papers*, 48(3), 301–312. DOI: 10.1080/00779954.2013.867795

Hamdi, H. and Sbia, R. (2013a) ‘Dynamic relationships between oil revenues, government spending and economic growth in an oil dependent economy’, *Economic Modelling,* 35(C), pp. 118-125. DOI: 10.1016/j.econmod.2013.06.043

Hamdi, H. and Sbia, R. (2013b) 'The relationship between natural resources rents, trade openness and economic growth in Algeria', *Economics Bulletin*, 33(2), pp. 1649-1659. Available at: http://www.accessecon.com/Pubs/EB/2013/Volume33/EB-13-V33-I2-P154.pdf (Accessed: 10 April 2019).

Hamdi, H. and Sbia, R. (2013) 'Are Investment and Saving Cointegrated? Evidence from Middle East and North African Countries', *The International Journal of Business and Finance Research*, 7(4), pp. 103-113. Available at: https://ssrn.com/abstract=2239966(Accessed: 2 December 2018).

Hanushek, E. A. and Kimko, D. D. (2000) 'Schooling, labor force quality, and the growth of nations', *American Economic Review*, 90(5), pp. 1184–1208. DOI: 10.1257/aer.90.5.1184.

Hanushek, E. A. and Woessmann, L. (2007) '*The Role of Education Quality for Economic Growth',* World Bank Policy Research Working Paper No. 4122. Available at: https://ssrn.com/abstract=960379 (Accessed: 12 February 2019).

Hanushek, E. A. and Wossmann, L. (2010) 'Education and Economic Growth', in Penelope Peterson, Eva Baker, Barry McGaw, (eds.) *International Encyclopedia of Education volume 2*. Oxford: Elsevier, pp. 245-252.

Harbison, F. H. (1971) 'Human Resources as the Wealth of Nations', *American Philosophical Society*, 115(6), pp. 426-431. Available at: https://www.jstor.org/stable/985834

Harding, T. and Venables, A.J. (2013) *'The Implications of Natural Resource Exports for Non-resource Trade',* OxCarre (Oxford Centre for the Analysis of Resource Rich Economies) Research Paper No. 103. Available at: https://www.economics.ox.ac.uk/materials/working_papers/4857/oxcarrerp2013103.pdf (Accessed: 24 January 2019)

Hassaballa, H. (2017) 'Studying the Effect of Corruption on Income Per-capita Level in an IV Estimation in Developing countries', *European Journal of Sustainable Development*, 6(1), pp. 57-70. DOI:10.14207/ejsd.2017.v6n1p57

Hassler, U. and Wolters, J. (2006) 'Autoregressive distributed lag models and cointegration', in Hübler, O. and Frohn, J. (eds.) *Modern Econometric Analysis*, New York: Springer. pp. 57-72.

Hellman, J., Jones, G. and Kaufmann, D. (2000) '*Seize the State, Seize the Day: State Capture, Corruption and Influence in Transition',* World Bank Policy Research Working Paper: 2444. Available at: http://siteresources.worldbank.org/INTWBIGOVANTCOR/Resources/seize_synth.pdf (Accessed: 11 May 2018).

Hertog, S., and Luciani, G. (2009) '*Energy and sustainability policies in the GCC',* Kuwait Programme on Development, Governance and Globalization in the Gulf States. UK: London School of Economics and Political Science.

Herzfeld, T. and Weiss, C. (2003) 'Corruption and Legal (In) Effectiveness: An Empirical Investigation', *European Journal of Political Economy,* 19(3), pp. 621-632, DOI: 10.1016/S0176-2680(03)00018-1

Hodgson, G. M. (2006) 'What Are Institutions?', *Journal of Economic Issues,* 40(1), pp. 1-25. DOI: 10.1080/00213624.2006.11506879

Hodler, R. (2006) 'The curse of natural resources in fractionalized countries', *European Economic Review,* 50(6), pp. 1367-1386. DOI: 10.1016/j.euroecorev.2005.05.004

Hsieh, C. and Klenow, P.J. (2007) 'Relative Prices and Relative Prosperity', *American Economic Review,* 97(3), pp. 562-585. DOI: 10.1257/aer.97.3.562

Hvidt, M. (2013) '*Economic diversification in GCC countries: Past record and future trends*', London School of Economics and Political Science. Available at: http://www.lse.ac.uk/IDEAS/programmes/kuwait/documents/economic- diversification-in-the-gcc-countries.pdf (Accessed: 21 February 2019)

Igwike, R. S., Hussain, M.E. and Noman, A. (2012) 'The Impact of Corruption on Economic Development: A Panel Data Analysis', *SSRN Electronic Journal.* DOI:10.2139/ssrn.2003061

Imbs, J., and Romain Wacziarg, R. (2003) 'Stages of Diversification', *American Economic Review* 93(1), pp. 63–86. DOI: DOI: 10.1257/000282803321455160

IMF (2016) 'Economic Diversification in Oil-Exporting Arab Countries', Manama: International Monetary Fund. Available at: https://www.imf.org/external/np/pp/eng/2016/042916.pdf

International Country Risk Guide, ICRG (2017) 'Country Data Online', Available at: https://epub.prsgroup.com/the-countrydata-gateway/ (Accessed: 14 October 2018).

International Monetary Fund, IMF (2019) *'World Economic and Financial Surveys'*. Available at: https://www.imf.org/external/pubs/ft/weo/2019/01/weodata/index.aspx (Accessed: 19 June 2019).

International Monetary Fund, IMF (2019) *'World Economic Outlook'*. Available at: https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/MENA/EGY/SDN/YEM/LBY/TUN/WEOWORLD/MEQ/BHR/KWT/ARE/SAU/QAT/OMN/NOR/NGA/IRQ/IRN/IND/DZA/AFG/ALB/AZE/AUS?year=2019 (Accessed: 21 June 2019).

Isham, J., Woolcock, M., Pritchett, L. and Busby, G. (2005) 'The Varieties of Resource Experience: Natural Resource Export Structures and the Political Economy of Economic Growth', *The World Bank Economic Review,* 19 (2), pp. 141–174. Available at: http://documents.worldbank.org/curated/en/184571468149698798/Varieties-of-resource-experience-natural-resource-export-structures-and-the-political-economy-of-economic-growth (Accessed: 2 October 2018).

Islam, R. and Montenegro, C. E. (2002) '*What determines the quality of institutions?',* Policy Research Working Paper No. 2764. Washington, DC: World Bank. Available at:

http://documents.worldbank.org/curated/en/416091468766754963/What-determines-the-quality-of-institutions (Accessed: 20 December 2017).

Ismail K. (2010) *'The Structural Manifestation of the 'Dutch Disease': The Case of Oil Exporting Countries',* International Monetary Fund Working Paper, 10/103. Available at: https://pdfs.semanticscholar.org/c52a/88abff1bd7f5a5ed770106c9b0469d217ab7.pdf (Accessed: 25 January 2018)

James, A. (2015) 'The resource curse: a statistical mirage?', *Journal of Development Economics*, 114(C), pp. 55-63. DOI: 10.1016/j.jdeveco.2014.10.006

James, A. and Aadland, D. (2011) 'The curse of natural resources: an empirical investigation of US counties', *Resource and Energy Economics*, 33(2), pp. 440-453. DOI:10.1016/j.reseneeco.2010.05.006

Jamison, E. A., Jamison, D. T., and Hanushek, E. A. (2007) 'The effects of education quality on mortality decline and income growth', *Journal of Economic Literature,* 46(3), pp. 607–668.

Ji, K., Magnus, J.R. and Wang, W. (2014) 'Natural resources, institutional quality, and economic growth in China', *Environmental and Resource Economics*, 57(3), pp. 323-343. DOI 10.1007/s10640-013-9673-8

Johansen, S., and Juselius, K. (1990) 'Maximum Likelihood Estimation and Inference on Cointegration– with Applications to the Demand for Money', *Oxford Bulletin of Economics and Statistics*, 52(2), pp. 169–210.

Jones, R. W. (1965) 'The Structure of Simple General Equilibrium Models', *Journal of Political Economy,* 73(6). pp. 557-572. Available at: https://www.jstor.org/stable/1829883 (Accessed: 16 March 2018).

Jung, H. and Thorbecke, E. (2003) 'The impact of public education expenditure on human capital, growth, and poverty in Tanzania and Zambia: a general equilibrium approach', *Journal of Policy Modeling*, 25(8), pp. 701-725. DOI: 10.1016/S0161-8938(03)00060-7

Justesen, M. (2008) 'The effect of economic freedom on growth revisited: New evidence on causality from a panel of countries 1970-1999', *European Journal of Political Economy*, 24(3), pp. 642-660. DOI:10.1016/j.ejpoleco.2008.06.003

Kakanov, E., Blöchliger, H. and Demmou, L. (2018) *'Resource curse in oil exporting countries'*, OECD Economics Department Working Papers No. 1511, Organisation for Economic Co-operation and Development Publishing. Available at: http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ECO/WKP(2018)59&docLanguage=En (Accessed 11 May 2019).

Kalyuzhnova, Y. and Kaser, M. (2006) 'Prudential management of hydrocarbon revenues in resource-rich transition economies', *Post-Communist Economies*, 18(2), pp.167-187. DOI: 10.1080/14631370600619857

Kalyuzhnova, Y., Kutan, A.M. and Yigit, T. (2009) ‘Corruption and economic development in energy-rich economies’, *Comparative Economic Studies,* 51(2), pp.165-180.

Kampelmann, S., Rycx, F., Saks, Y., and Tojerow, I. (2018) ‘Does education raise productivity and wages equally? The moderating role of age and gender’, *IZA Journal of Labor Economics,* 7(1). DOI: 10.1186/s40172-017-0061-4

Karabegovic, A. (2009) ‘*Institutions, Economic Growth, and the" curse" of Natural Resources'.* Canada: Fraser Institute.

Karl, T. L. (1997) ‘The Paradox of Plenty: Oil Booms and Petro-States. Studies in International Political Economy’. United States: University of California Press.

Kaufmann, D., Kraay, A. and Mastruzzi, M. (2009) ‘*Governance matters VIII: Governance indicators for 1996–2008*’, World Bank Policy Research Working Paper No. 4978. DOI:10.1596/1813-9450-4978

Kaufmann, D., Kraay, A. and Zoido-Lobaton, P. (1999) ‘*Governance Matters',* World Bank Policy Research Working Paper No. 2196. DOI: 10.1596/1813-9450-2196

Keller, K. R. I. (2006) ‘Investment in primary, secondary, and higher education and the effects on economic growth’, *Contemporary Economic Policy,* 24(1), pp. 18-34. DOI: 10.1093/cep/byj012

Kim, D. and Lin, S. C. (2017) ‘Human capital and natural resource dependence’, *Structural Change and Economic Dynamics*, 40(C), pp. 92-102. DOI: 10.1016/j.strueco.2017.01.002

King, R. and Levine, R. (1994) ‘Capital fundamentalism, economic development, and economic growth’, *Carnegie-Rochester Conference Series on Public Policy,* 40, pp. 259-292. DOI: 10.1016/0167-2231(94)90011-6

Klenow, P and Rodriguez-Clare, A. (1997) ‘The Neoclassical Revival in Growth Economics: Has It Gone Too Far?’, in Bernanke, B.S. and Rotemberg, J. (eds.) *NBER Macroeconomics Annual, volume 12*, pp. 73-114. Available at: http://www.nber.org/chapters/c11037.pdf (Accessed: 10 April 2019).

Knack, S. (1999) *‘Social capital, growth, and poverty: a survey of cross-country evidence',* Social Capital Initiative Working Paper No. 7. Washington, D.C.: The World Bank. Available at: http://documents.worldbank.org/curated/en/517621468739260100/Social-capital-growth-and-poverty-a-survey-of-cross-country-evidence (Accessed: 3 March 2018).

Knack, S. (1999) ‘*Democracy, Governance and Growth*’, United States: The University of Michigan Press.

Knack, S. and Keefer, P. (1995) ‘Institutions and economic performance: cross-country tests using alternative institutional measures’, *Economics and Politics,* 7(3), pp. 207-227. DOI: 10.1111/j.1468-0343.1995.tb00111.x

Knack, S. and Keefer P. (1997) ‘Does Social Capital Have an Economic Payoff? A Cross-Country Investigation’, *The Quarterly Journal of Economics*, 112(4), pp. 1251–1288. DOI: 10.1162/003355300555475

Knowles, S. and Owen, P. D. (1995) 'Health capital and cross-country variation in income per capita in the Mankiw-Romer-Weil model', *Economics Letters,* 48(1), pp. 99-106. DOI:10.1016/0165-1765(94)00577-O

Kolstad, I. (2009) 'The resource curse: which institutions matter?', *Applied Economics Letters,* 16(4), pp. 439–442. DOI: 10.1080/17446540802167339

Kolstad, I., and Soreide, T. (2009) 'Corruption in natural resource management: Implications for policy makers', *Resources Policy*, *34*(4), pp. 214-226. DOI:10.1016/j.resourpol.2009.05.001

Kolstad, I. and Wiig, A. (2009) 'It's the rents, stupid! The political economy of the resource curse', *Energy Policy,* 37(12), pp. 5317–5325. DOI: 10.1016/j.enpol.2009.07.055

Kronenberg, T. (2004) 'The curse of natural resources in the transition economies', *Economics of Transition* becomes *Economics of Transition and Institutional Change*, 12(3), pp. 399-426. DOI:10.1111/j.0967-0750.2004.00187.x

Krueger, A. B., and Lindahl, M. (2001) 'Education for growth: Why and for whom?', *Journal of Economic Literature*, 39(4), pp. 1101-36. DOI:10.1257/jel.39.4.1101

Krugman, P. (1987) 'The narrow moving band, the Dutch disease, and the competitive consequences of Mrs. Thatcher: Notes on trade in the presence of dynamic scale economies', *Journal of Development Economics,* 27(1-2), pp. 41-55. DOI: 10.1016/0304-3878(87)90005-8

Kumar, A. and Chen, W. (2013) 'Health, education and the dynamics of cross-country productivity differences', *Applied Economics Letters,* 20(12), pp. 1160-1164. DOI: 10.1080/13504851.2013.797549

Kumar, A. and Kober, B. (2012) 'Urbanization, human capital, and cross-country productivity differences', *Economics Letters*, 117(1), pp. 14-17. DOI: 10.1016/j.econlet.2012.04.072

Kurtz, M. and Brooks, S. (2011) 'Conditioning the "Resource Curse": Globalization, Human Capital, and Growth in Oil-Rich Nations', *Comparative Political Studies*, 44(6), pp. 747-770. DOI:10.1177/0010414011401215

La Porta, R., Lopez-De-Silanes, F. and Shleifer, A. (2002) 'Government Ownership of Banks', *The Journal of Finance*, 57(1), pp. 265-301. DOI: 10.1111/1540-6261.00422

Lambsdorff, J. (2002) 'Corruption and Rent-Seeking', *Public Choice*, 113(1-2), pp. 97-125. DOI: 10.1023/A:1020320327526

Lambsdorff, J. (2007) '*The institutional economics of corruption and reform: Theory, evidence, and policy',* Cambridge: Cambridge University Press.

Lane, P. R., and Tornell, A. (1996) 'Power, Growth and the Voracity Effect', *Journal of Economic Growth,* 1(2), pp. 213-241. DOI: 10.1007/BF00138863

Lau, L. J., Jamison, D. T. and Louat, F. F. (1991) *'Education and productivity in developing countries: an aggregate production function approach'*, Policy, Research, and External

Affairs Working Papers No. 612, World Development Report. Available at: http://documents.worldbank.org/curated/en/720681468739788036/Education-and-productivity-in-developing-countries-an-aggregate-production-function-approach (Accessed: 13 September 2018).

Leamer, E., Schott, P., Maul, H. and Rodriguez, S. (1999) ‘Does Natural Resource Abundance Increase Latin American Income Inequality’, *Journal of Development Economics,* 59(1), pp. 3-42. DOI: 10.1016/S0304-3878(99)00004-8

Lederman, D. and Maloney, W. F. (2007) ‘Natural Resources: Neither Curse nor Destiny’. Washington, DC: The World Bank and Stanford University Press.

Lederman, D. and Maloney, W.F. (2008) ‘In Search of the Missing Resource Curse’, *Economía*, 9(1), pp. 1–56. DOI:10.1353/eco.0.0012

Lederman, D., Loayza, N. V. and Soares, R. R. (2005) ‘Accountability and Corruption: Political Institutions Matter’, *Economics and Politics,* 17(1), pp. 1–35. DOI: 10.1111/j.1468-0343.2005.00145.x

Leightner, J. E. and Inoue, T. (2012) ‘Solving the Omitted Variables Problem of Regression Analysis Using the Relative Vertical Position of Observations’, *Advances in Decision Sciences,* 2012(728980). DOI:10.1155/2012/728980

Leite, C. and Weidmann, J. (1999) ‘*Does mother nature corrupt? Natural resources, corruption and economic growth.* International Monetary Fund, Working Paper No 99/85, Available at: https://ssrn.com/abstract=259928 (Accessed: 2 September 2018).

Liberto, A., Pigliaru, F. and Chelucci, P. (2011) ‘International TFP Dynamics and Human Capital Stocks: A Panel Data Analysis, 1960- 2003’, *Review of Income and Wealth,* 57(1), pp. 156-182. DOI: 10.1111/j.1475-4991.2010.00379.x

Lipset, S. M. (1960) ‘*Political man: The social basis of modern politics’,* New York: Doubleday.

Loayza, N.V., Ranciere, R., Serven, L. and Ventura, J. (2007) ‘Macroeconomic volatility and welfare in developing countries: an introduction’, *World Bank Economic Review,* 21(3), pp. 343-357. Available at: http://documents.worldbank.org/curated/en/577091468180899931/Macroeconomic-volatility-and-welfare-in-developing-countries-an-introduction (Accessed: 2 Feb 2018)

Loko, B. and Diouf, M. (2009) ‘*Revisiting the Determinants of Productivity Growth: What's New?’* International Monetary Fund, Working Paper No. 09/225. DOI: 10.5089/9781451873726.001

Looney, R. (1991) ‘Diversification in a Small Oil Exporting Country; The Impact of the Dutch Disease on Kuwait's Industrialization’, *Resources Policy,* 17(1), pp. 31-41. DOI:10.1016/0301-4207(91)90024-P

Lucas, R. E. (1988) ‘On the mechanics of economic development’, *Journal of Monetary Economics*, 22(1), pp. 3-42. DOI:10.1016/0304-3932(88)90168-7

Lucas, R. E. (1990) 'Why Does Capital Flow from Rich to Poor Countries?' *American Economic Review*, 80(2), pp. 92-96. Available at: https://EconPapers.repec.org/RePEc:aea:aecrev:v:80:y:1990:i:2:p:92-96 (Accessed: 20 December 2018).

Manuelli, R. E., and Seshadri, A. (2014) 'Human Capital and the Wealth of Nations', *American Economic Review*, 104(9), pp. 2736-62. DOI: 10.1257/aer.104.9.2736

Mauro, P. (1995) 'Corruption and Growth', *The Quarterly Journal of Economics*, 110(3), pp. 681–712. DOI: 10.2307/2946696

Mauro, P. (1997) *'The Effects of Corruption on Growth, Investment, and Government Expenditure: A Cross-Country Analysis',* International Monetary Fund, Working Paper No. 96/98. Available at SSRN: https://ssrn.com/abstract=882994 (Accessed: 20 December 2018).

Mavrotas, G., Murshed, SM. and Torres, S. (2011) 'Natural resource dependence and economic performance in the 1970–2000 period', *Review of Development Economics*, 15(1), pp. 124–138. DOI:10.1111/j.1467-9361.2010.00597.x

McDonald, S. and Roberts, J. (2002) 'Growth and multiple forms of human capital in an augmented Solow model: a panel data investigation', *Economics Letters*, 74(2), pp. 271-276. Available at: http://www.sciencedirect.com/science/article/pii/S0165-1765(01)00539-0 (Accessed: 20 January 2019).

Mehar, M. R., Hasan, A., Sheikh, M. A., and Adeeb, B. (2018) 'Total Natural Resources Rent Relation with Economic Growth: The Case of Pakistan and India, *European Journal of Economic and Business,* 3(3), pp. 14-22. Available at: http://lawarencepress.com/ojs/index.php/EJEB/article/view/538/960 (Accessed: 29 January 2019).

Mehlum, H., Moene, K. and Torvik, R. (2006) 'Cursed by Resources or Institutions?', *World Economy*, 29(8), pp. 1117–1131. DOI: 10.1111/j.1467-9701.2006.00808.x

Mehrara, M., Alhosseini, S.M.S., and Bahramirad, D. (2011) 'Resource Curse and Institutional Quality in Oil Countries', *Middle Eastern Finance and Economics Journal*, Issue 9.

Meon, P. and Sekkat, K. (2005) 'Does corruption grease or sand the wheels of growth?', *Public Choice,*122(1), pp. 69-97. DOI: 10.1007/s11127-005-3988-0

Michaels, G. (2011) 'The long-term consequences of resource-based specialization', *The Economic Journal*,121(551), pp. 31-57. DOI:10.1111/j.1468-0297.2010.02402.x

Miller S.M., and Upadhyay M.P. (2000) 'The effects of openness, trade orientation, and human capital on total factor productivity', *Journal of Development Economics*, 63(2), pp. 399–423. Available at: http://www.sciencedirect.com/science/article/pii/S0304-3878(00)00112-7 (Accessed: 20 January 2019)

Miller, S. M. and Upadhyay, M.P. (2002) '*Total Factor Productivity, Human Capital and Outward Orientation: Differences by Stage of Development and Geographic Regions',* Economics Working Papers No. 200233. Available at: http://digitalcommons.uconn.edu/econ_wpapers/200233 (Accessed: 20 January 2019)

Mincer, J. (1958) 'Investment in Human Capital and Personal Income Distribution', *Journal of Political Economy*, 6(4), pp. 281—302. DOI: 10.1086/258055

Mincer, J. (1974) '*Schooling, Earnings, and Experience'*. New York: Columbia University Press.

Ministry of Commerce and Investment (2019) '*Statistics'*. Available at: https://mci.gov.sa/en/About/Statistics/Pages/default.aspx (Accessed: 11 June 2019).

Ministry of Economy (2018) *'United Arab Emirates Statistics Reports'*. Available at: https://www.economy.gov.ae/english/Knowledge-Section/Pages/Statistics-Reports.aspx (Accessed: 10 June 2019)

Ministry of Economy and Planning (MEP) (2018) *'Saudi Economic Indicators',* Available at: https://www.mep.gov.sa/en/Pages/EconomicIndicators.aspx (Accessed: 2 June 2019).

Ministry of Oil (2018) '*The State of Kuwait'*. Available at: http://www.moo.gov.kw/About-Kuwait/Brief-Info.aspx (Accessed: 10 May 2019)

Mo, P. (2001) 'Corruption and Economic Growth', *Journal of Comparative Economics*, 29(1), pp. 66-79. DOI: 10.1006/jcec.2000.1703

Montinola, G. R. and Jackman, R. W. (2002) 'Sources of Corruption: A Cross-Country Study', *British Journal of Political Science*, 32(01), pp 147 – 170. DOI: 10.1017/S0007123402000066

Moradbeigi, M. and Law, S.H. (2017) 'The role of financial development in the oil-growth nexus', *Resources Policy*, 53(C), pp. 164-172. DOI: 10.1016/j.resourpol.2017.06.016

Moss, T. J. (2010) '*Oil to cash: Fighting the resource curse through cash transfers',* Centre for Global Development Working Paper No. 237. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1824605 (Accessed: 12 February 2018).

Murphy, K. M., Shleifer, A. and Vishny, R.W. (1993) 'Why Is Rent-Seeking So Costly to Growth?', *The American Economic Review'*, 83(2), pp. 409–414. Available at: https://scholar.harvard.edu/shleifer/files/rent_seeking.pdf (Accessed 13 May 2018).

Murshed, S.M. (2007) 'What turns a blessing into a curse? The political economy of natural resource wealth', *The Pakistan Development Review*, 46(4), pp. 351–377. Available at: http://www.pide.org.pk/pdf/PDR/2007/Volume4/351-377.pdf (Accessed: 2 March 2017).

Mustapha, N. (2014) 'The Impact of Corruption on GDP Per Capita', Journal of Eastern European and Central Asian Research, 1(2). DOI: 10.15549/jeecar.v1i2.76.

Nachega, J. and Fontaine, T. (2006) *'Economic Growth and Total Factor Productivity in Niger',* International Monetary Fund, Working Paper No. 06/208. DOI:10.5089/9781451864687.001

Nation Master (2019) 'Countries Compared'. Available at: https://www.nationmaster.com/country-info/stats/Geography/Area. (Accessed: 10 May 2018).

NationMaster (2019) 'Kuwait Economy Stats'. Available at: http://nationmaster.com/country-info/profiles/Kuwait/Economy (Accessed: 27 June 2019)

NationMaster (2019) 'United Arab Emirates Economy Stats', Available at: http://www.nationmaster.com/country-info/profiles/United-Arab-Emirates/Economy (Accessed: 27 June 2019)

NationMaster (2019) 'Saudi Arabia Economy Stats', Available at: http://www.nationmaster.com/country-info/profiles/Saudi-Arabia/Economy (Accessed: 27 June 2019)

Nawaz, S. and Alvi, S. (2017) 'The impact of malnutrition and lack of access to clean water on productivity', *Journal of Business & Economics,* 9(1), pp. 66-86.

Nawaz, S., Iqbal, N. and Khan, M.A. (2014) 'The Impact of Institutional Quality on Economic Growth: Panel Evidence', *The Pakistan Development Review,* 53(1), pp. 15-31. Available at: https://www.jstor.org/stable/24397923 (Accessed 12 September 2018).

Nelson, R. and Phelps, E. (1966) 'Investment in humans, technological diffusion, and economic growth' *American Economic Review,* 56(1/2), pp. 69–75. Available at: https://www.jstor.org/stable/1821269 (Accessed: 21 January 2019).

Neumayer, E. (2004) 'Does the "Resource Curse" Hold for Growth in Genuine Income as Well?' *World Development,* 32(10), pp.1627–1640. DOI:10.1016/j.worlddev.2004.05.005

Nieva, F. O. (2015) 'Social women entrepreneurship in the Kingdom of Saudi Arabia', *Journal of Global Entrepreneurship Research,* 5(11), pp. 1-33. DOI 10.1186/s40497-015-0028-5

Nkoro, E. and Uko, A. K. (2016) 'Autoregressive Distributed Lag (ARDL) cointegration technique: application and interpretation', *Journal of Statistical and Econometric Methods,* 5(4), pp.63-91. Available at: http://www.scienpress.com/Upload/JSEM%2fVol%205_4_3.pdf (Accessed: 10 October 2018).

Norman, C. (2009) 'Rule of Law and the Resource Curse: Abundance Versus Intensity', *Environmental & Resource Economics,* 43(2), pp.183-207. DOI: 10.1007/s10640-008-9231-y

North, D.C. (1981) '*Structure and Change in Economic History'*, London: Norton & Co.

North, D. (1990) *'Institutions, Institutional Change and Economic Performance'.* Cambridge: Cambridge University Press.

North, D. (1994) 'Economic performance through time', *The American Economic Review,* 84(3), pp. 359–368. Available at: ttps://www.jstor.org/stable/2118057 (Accessed: 10 November 2018).

Nye, J. S. (1967) ‘Corruption and Political Development: A Cost-Benefit Analysis’, *The American Political Science Review*, 61(2), pp. 417-427. DOI: 10.2307/1953254

OilPrice.com (2019) *‘Is Oil Trending? How Twitter Influences Oil Price Volatility’.* Available at: https://oilprice.com/Energy/Oil-Prices/Is-Oil-Trending-How-Twitter-Influences-Oil-Price-Volatility.html# (Accessed: 2 June 2019).

Okada, K. and Samreth, S. (2017) ‘Corruption and natural resource rents: evidence from quantile regression’, *Applied Economics Letters*, 24(20), pp. 1490-1493, DOI: 10.1080/13504851.2017.1287849

Olayungbo, D. O. and Adediran, K. A. (2017) ‘Effects of Oil Revenue and Institutional Quality on Economic Growth with an ARDL Approach’, *Energy and Policy Research,* 4(1), pp. 44–54. DOI:10.1080/23815639.2017.1307146

Olken, B. (2007) ‘Monitoring Corruption: Evidence from a Field Experiment in Indonesia’, *Journal of Political Economy,* 115, pp. 200-249. DOI: 10.1086/517935

Olken, B. (2009) ‘Corruption Perceptions vs. Corruption Reality’, *Journal of Public Economics,* 93(7-8), pp. 950-964. DOI: 10.1016/j.jpubeco.2009.03.001

Olken, B. and Barron, P. (2009) ‘The Simple Economics of Extortion: Evidence from Trucking in Aceh’, *Journal of Political Economy*, 117(3), pp. 417-452. DOI: 10.1086/599707

Ologunla, S.E., Kareem, R.O, and Raheem, K.A. (2014) ‘Institutions and the resource curse in Nigeria’, *Journal of Sustainable Development Studies,* 7(1), pp. 36-51.

Omodadepo, A. and Akanni, P. (2013) ‘Oil Wealth; Meat in Norway, Poison in Nigeria: An Analysis of Human Capital as a Transmission Channel of Resource Curse’, *Journal of World Economic Research,* 2(3), pp. 39 – 44. DOI: 10.11648/j.jwer.20130203.12

Oreopoulos, P. and Salvanes, K. G. (2009) ‘*How Large are Returns to Schooling? Hint: Money Isn’t Everything’, NBER Working Paper* No 15339. Available at: http://www.nber.org/papers/w15339 (Accessed: 4 October 2018).

Organization of Petroleum Exporting Countries, OPEC (2019) *‘Brief History’.* Available at: https://www.opec.org/opec_web/en/about_us/24.htm (Accessed: 14 June 2019).

Organization of Petroleum Exporting Countries, OPEC (2019) *‘Kuwait’.* Available at: https://www.opec.org/opec_web/en/about_us/165.htm. (Accessed: 14 June 2019).

Organization of Petroleum Exporting Countries, OPEC (2019) *‘Member Countries’*. Available at: https://www.opec.org/opec_web/en/about_us/25.htm (Accessed: 4 June 2019).

Organization of Petroleum Exporting Countries, OPEC (2019) ‘Saudi Arabia facts and figures’. Available at: https://www.opec.org/opec_web/en/about_us/169.htm. (Accessed: 14 June 2019).

Oskenbayev, Y., Yilmaz, M. and Abdulla, K. (2013) ‘Resource concentration, institutional quality and the natural resource curse’, *Economic Systems,* 37(2), pp. 254–270. DOI:10.1016/j.ecosys.2012.11.001

Oyinlola, M., Adeniyi, O., and Raheem, I. (2015) 'Natural resource abundance, institutions and economic growth in Africa', *African Journal of Economic and Sustainable Development*, 4(10), pp. 34-48. DOI: 10.1504/AJESD.2015.068513

Oyinlola, M.A., Adeniyi, O.A. and Raheem, I.D. (2015) 'Natural resource abundance, institutions and economic growth in Africa', *African J. of Economic and Sustainable Development*, 4(1), pp. 34-48. DOI:10.1504/AJESD.2015.068513

Ozturk, I., (2001) *'The role of education in economic development: a theoretical perspective',* MPRA Paper No. 9023, University Library of Munich, Germany. DOI: 10.2139/ssrn.1137541

Paiders, J. (2008) 'Relationship between corruption level changes and economic growth in the world end Europe', *Proceedings of the International scientific conference: Research for Rural Development*. 14, Jelgava (Latvia), 21-23 May 2008.

Papyrakis, E. and Gerlagh, R. (2004) 'The resource curse hypothesis and its transmission channels', *Journal of Comparative Economics*, 32(1), pp.181-193. Available at: http://www.sciencedirect.com/science/article/pii/S0147-5967(03)00139-2 (Accessed: 19 January 2019).

Papyrakis, E. and Gerlagh, R. (2007) 'Resource abundance and economic growth in the United States', *European Economic Review,* 51(4), pp.1011-1039. DOI:10.1016/j.euroecorev.2006.04.001

Pattillo, C., Poirson, H. and Ricci, L. (2004) *'What Are the Channels through which External Debt Affects Growth',* International Monetary Fund, Working Paper WP 04/15/. DOI:10.5089/9781451843293.001

Pelinescu, E. (2015) 'The Impact of Human Capital on Economic Growth', *Procedia Economics and Finance,* 22, pp.184-190. DOI: 10.1016/S2212-5671(15)00258-0

Pendergast, S. M., Clarke, J. A. and Van Kooten, G. C. (2011) 'Corruption, development and the curse of natural resources', *Canadian Journal of Political Science*, 44(2), pp. 411-437. Available at: https://www.jstor.org/stable/41300548 (Accessed: 6 October 2018).

Perera, L. D. and Lee, G. H. (2013) 'Have Economic Growth and Institutional Quality Contributed to Poverty and Inequality Reduction in Asia?', *Journal of Asian Economics,* 27, pp. 71-86. DOI: 10.1016/j.asieco.2013.06.002.

Pesaran, M. H. (2006) 'Estimation and Inference in Large Heterogeneous Panels with a Multifactor Error Structure', *Econometrica,* 74(4), pp. 967-1012. DOI: 10.1111/j.1468-0262.2006.00692.x

Pesaran, M.H. and Shin, Y. (1999) An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis', in Strom, S. (ed.) *Econometrics and Economic Theory in the 20th Century the Ragnar Frisch Centennial Symposium,* Cambridge: Cambridge University Press, pp. 371-413.

Pesaran, M.H., Shin, Y., and Smith, R. J. (2001) 'Bounds Testing Approaches to the Analysis of Level Relationships, *Journal of Applied Econometrics,* 16(3), pp. 289-326. DOI: 10.1002/jae.616

Petermann, A., Guzmán, J. I., and Tilton, J. E. (2007) 'Mining and corruption', *Resources Policy*, *32*(3), pp. 91-103. DOI:10.1016/j.resourpol.2007.08.003

Petrakis, P. and Stamatakis, D. (2002) 'Growth and educational levels: a comparative analysis', *Economics of Education Review*, 21(5), pp. 513-521. DOI:10.1016/S0272-7757(01)00050-4

Pick, D. and Thein, H. (2010) 'Development failure and the resource curse: the case of Myanmar', *International Journal of Sociology and Social Policy,* 30(5/6), pp. 267-279. DOI: 10.1108/01443331011054235

Poelhekke, S. and Van der Ploeg, F. (2009) 'Volatility and The Natural Resource Curse', *Oxford Economic Papers*, 61(4), pp. 727-760. DOI: 10.1093/oep/gpp027

Poelhekke, S. and Van der Ploeg, F. (2010) 'Do Natural Resources Attract FDI? Evidence from Non-Stationary Sector Level Data', *SSRN Electronic Journal.* DOI: 10.2139/ssrn.1950092

Poelhekke, S. and Van der Ploeg, F. (2017) 'The impact of natural resources: survey of recent quantitative evidence', *The Journal of Development Studies*, 53(2), pp. 205-216. DOI: 10.1080/00220388.2016.1160069

Prebisch, R (1950) '*The Economic Development of Latin America and Its Principal Problems',* New York: United Nations.

Pritchett, L. (2001) *'Where Has All the Education Gone?', World Bank Economic Review*, 15(3), pp. 367–391. Available at: https://www.jstor.org/stable/3990107 (Accessed: 6 March 2019).

Profillidis, V. A. and Botzoris, G. N. (2018) 'Trend Projection and Time Series Methods', in Profillidis, V. A. and Botzoris, G. N. (eds.) *Modeling of Transport Demand,* London: Elsevier, pp. 225-270.

Psacharopoulos, G. (1973) '*Returns to education: An international comparison*'. Amsterdam: Elsevier.

Psacharopoulos, G. (1994) 'Returns to investment in education: A global update', *World Development*, 22(9), pp. 13225-1343. DOI: 10.1016/0305-750X(94)90007-8

Psacharopoulos, G. and Patrinos, H. (2004) 'Returns to Investment in Education: A Further Update', *Education Economics,* 12(2), pp. 111-134. DOI: 10.1080/0964529042000239140

Public Authority for Civil Information, PACI (2018) '*Statistical Reports'*. Available at: http://stat.paci.gov.kw/englishreports (Accessed: 10 May 2019)

Raggl, A. K. (2017) '*Natural resources, institutions, and economic growth: the case of Nigeria',* The World Bank Working Paper No. 8153. Available at: https://openknowledge.worldbank.org/handle/10986/27960 (Accessed: 7 January 2019).

Richardson, V. (1997) 'Constructivist teaching and teacher education: Theory and practice', in Richardson, V. (ed.) *Constructivist Teacher Education: Building New Understandings*. Washington, DC: Falmer Press, pp. 3-14.

Robinson, J., Acemoglu, D. and Johnson, S. (2005) 'Institutions as a Fundamental Cause of Long-Run Growth', *Handbook of Economic Growth*, 1(A), pp. 386-472. DOI: 10.1016/S1574-0684(05)01006-3

Robinson, J., Torvik, R. and Verdier, T. (2006) 'Political foundations of the Resource Curse', *Journal of Development Economics,* 79(2), pp. 447– 468. DOI: 10.1016/j.jdeveco.2006.01.008

Rodriguez, F. and Sachs, J. D. (1999) 'Why do resource-abundant economies grow more slowly?', *Journal of Economic Growth*, 4(3), pp. 277-303. DOI: 10.1023/A:1009876618968

Rodriguez, J.P. and Loomis, S.R. (2007) 'A New View of Institutions, Human Capital, and Market Standardization', *Education, Knowledge & Economy,* 1(1), pp. 93–105. DOI: 10.1080/17496890601128357

Rodrik, D., Subramanian, A. and Trebbi, F. (2004) 'Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development', *Journal of Economic Growth*, 9(2), pp. 131-165. Available at: http://journals.kluweronline.com/issn/1381-4338/contents (Accessed: 21 March 2018).

Romer, P. M. (1986) 'Increasing Returns and Long-Run Growth', *Journal of Political Economy,* 94(5), pp.1002-1037. Available at: https://www.jstor.org/stable/1833190

Romer, P. M. (1990) 'Endogenous Technological Change', *Journal of Political Economy,* 98(5), pp. 71–102. DOI: 10.3386/w3210

Rose-Ackerman, S. (1978) *'Corruption: a study in political economy'*. United States: Academic Press.

Rose-Ackerman, S. and Palifka, B. J. (2016) '*Corruption and Government: Causes, Consequences, And Reform'*. (2nd ed.). Cambridge: Cambridge University Press.

Rosen, H. S. (1999) '*Public Finance'*. New York: McGraw-Hill.

Ross, M. (1999) 'The political economy of the resource curse', *World Politics*, 51(02), pp. 297-322. DOI:10.1017/S0043887100008200

Ross, M. (2001) 'Does Oil Hinder Democracy?', *World Politics,* 53(3), pp. 325-361. DOI:10.1353/wp.2001.0011

Ross, M (2004) 'What Do We Know about Natural Resources and Civil War?', *Journal of Peace Research*, 41(3), pp. 337–356. DOI:

Ross, M. (2015) 'What have we learned about the resource curse?' *Annual Review of Political Science,* 18(1), pp. 239-259. DOI: 10.1146/annurev-polisci-052213-040359

Rosser, A. (2006) '*The Political Economy of the Resource Curse: A Literature Survey.* Institute of Development, Working Paper No 268, 1–36. Brighton: IDS. Available at:

http://opendocs.ids.ac.uk/opendocs/handle/123456789/4061 (Accessed: 13 December 2017).

Sachs, J. (2007) 'How to handle the macroeconomics of oil wealth', in Humphreys, M., Sachs, J.D. and Stiglitz, J.E. (eds.) *Escaping the Resource Curse*. New York: Columbia University Press. pp. 173–193.

Sachs, J. D. and Warner, A. M. (1995) *'Natural Resource Abundance and Economic Growth',* NBER Working Papers No. 5398, National Bureau of Economic Research. Cambridge, MA. Available at SSRN: https://ssrn.com/abstract=225459 (Accessed: 9 October 2017)

Sachs, J. D. and Warner, A. M. (1997) 'Sources of Slow Growth in African Economies', *Journal of African Economies*, 6(3), pp. 335-376. DOI: 10.1093/oxfordjournals.jae.a020932

Sachs, J. D. and Warner, A. M. (1999) 'The Big Push, Natural Resource Booms and Growth', *Journal of Development Economics,* 59(1), pp. 43-76. DOI: 10.1016/S0304-3878(99)00005-X

Sachs, J. D. and Warner, A. M. (2001) 'The Curse of Natural Resources', *European Economic Review,* 45(4-6), pp. 827-838. DOI: 10.1016/S0014-2921(01)00125-8

Sala-i-Martin (1997) 'I just ran two million regressions', *The American Economic Review,* 87(2), pp.178-183. Available at: https://www.jstor.org/stable/2950909 (Accessed: 20 October 2018).

Sala-i-Martin, X. and Subramanian, A. (2013) 'Addressing the Natural Resource Curse: An Illustration from Nigeria', *Journal of African Economies,* 22(4), pp. 570-615. DOI: 10.1093/jae/ejs033

Sala-i-Martin, X., Doppelhofer, G. and Miller R.I. (2004) 'Determinants of Long-Term Growth: A Bayesian Averaging of Classical Estimates (BACE) Approach', *American Economic Review,* 94 (4), pp. 813-835. DOI: 10.1257/0002828042002570

Sandbu, M. E. (2006) 'Natural wealth accounts: A proposal for alleviating the natural resource curse', *World Development*, 34(7), pp. 1153-1170. DOI:10.1016/j.worlddev.2005.11.014

Sarel, M. M. (1997) '*Growth and productivity in ASEAN countries*', International Monetary Fund, Working paper 97/97. Available at: https://www.imf.org/external/pubs/ft/wp/wp9797.pdf (Accessed: 22 October 2018).

Sarmidi, T., Law, S. H. and Jafari, Y. (2014) 'Resource curse: new evidence on the role of institutions', *International Economic Journal,* 28(1), pp. 191-206. DOI: 10.1080/10168737.2013.787110

Sarr, M. and Wick, K. (2010) 'Resources, conflict and development choices: public good provision in resource rich economies', *Economics of Governance,* 11(2), pp. 183–205. DOI 10.1007/s10101-010-0075-x

Satti, S.L., Farooq, A., Loganathan, N. and Shahbaz, M. (2014) 'Empirical evidence on the resource curse hypothesis in oil abundant economy', *Economic Modelling*, 42(C), pp. 421–429. DOI: 10.1016/j.econmod.2014.07.020

Saudi Arabian Monetary Authority, SAMA (2019) '*Economic Reports and Statistics'*. Available at: http://www.sama.gov.sa/en-us/EconomicReports/Pages/default.aspx (Accessed: 11 June 2019).

Saunders, M., Lewis, P. and Thornhill, A. (2012) *'Research Methods for Business Students'*, London: Pearson Education Limited

Schultz, T.W. (1961) 'Investment in Human Capital', *The American Economic Review,* 51(1), pp. 1-17.

Seck, A. (2011) 'International technology diffusion and economic growth: explaining the spill over benefits to developing countries', *Structural Change and Economic Dynamics,* 23(4), pp. 437-451. DOI:10.1016/j.strueco.2011.01.003

Seker, M, and Saliola, F. (2018) 'A cross-country analysis of total factor productivity using micro-level data,' *Central Bank Review*, 18(1), pp. 13-27. DOI: 10.1016/j.cbrev.2018.01.001

Seldadyo, H. and De Haan, J. (2006) 'The determinants of corruption: A literature survey and new evidence', *2006 EPCS conference,* Turku, Finland, 20–23 April.

Serra, D. (2006) 'Empirical determinants of corruption: A sensitivity analysis', *Public Choice,* 126(1-2), pp. 225–256. DOI:10.1007/s11127-006-0286-4

Shahbaz, M., Zakaria, M., Shahzad, J. and Mahalik, M. (2018) 'The Energy Consumption and Economic Growth Nexus in Top Ten Energy-Consuming Countries: Fresh Evidence from Using the Quantile-on-Quantile Approach', *Energy Economics,* 71(C), pp. 282-301. DOI: 10.1016/j.eneco.2018.02.023

Shahbaz, M., Naeem, M., Ahad, M. and Tahir, I. (2018) 'Is natural resource abundance a stimulus for financial development in the USA?', *Resources Policy,* 55(C), pp. 223-232. DOI:10.1016/j.resourpol.2017.12.006

Shahbaz, M., Destek, M. A., Okumus, I. and Sinha, A. (2019) 'An empirical note on comparison between resource abundance and resource dependence in resource abundant countries' *Resources Policy,* 60(C), pp. 47-55. DOI:10.1016/j.resourpol.2018.12.002

Shao, S. and Yang, L. (2014) 'Natural resource dependence, human capital accumulation, and economic growth: a combined explanation for the resource curse and the resource blessing', *Energy Policy,* 74(C), pp. 632-642. DOI: 10.1016/j.enpol.2014.07.007

Sharpe, A. (1998) '*Productivity: Key to Success*. Ottawa: Centre for the Study of Living Standards. Report prepared by the Centre for the Study of Living Standards for The Atlantic Canada Opportunities Agency.

Sianesi, B. and Van Reenen, J. (2003) 'The Returns to Education: Macroeconomics', *Journal of Economic Surveys,* 17(2), pp. 157-200. DOI: 10.1111/1467-6419.00192

Singer, H. W. (1950) 'The Distribution of Gains between Investing and Borrowing Countries', *The American Economic Review,* 40(2), pp.473–85. Available at: http://www.jstor.org.gate2.library.lse.ac.uk/s (Accessed: 13 October 2018).

Singh, S. R. (2008) 'A computational method of forecasting based on fuzzy time series', *Mathematics and Computers in Simulation,* 79(3), pp. 539-554 DOI:10.1016/j.matcom.2008.02.026

Smith, R. (2015) 'Educational research: The importance of the humanities', *Educational Theory,* 65(6), pp. 739–754. DOI: 10.1111/edth.12145

Solow, R. M. (1956) 'A Contribution to the Theory of Economic Growth', *Quarterly Journal of Economics*, 70(1), pp. 65-94. DOI: 10.2307/1884513

Solow, R. M. (1957) 'Technical Change and the Aggregate Production Function', *The Review of Economics and Statistics,* 39(3), pp. 312-320. DOI:10.2307/1926047

Solow, R. M. (1962) 'Substitution and Fixed Proportions in the Theory of Capital', *Review of Economic Studies*, 29(3), pp. 207-218. DOI: 10.2307/2295955

Sovacool, B.K. (2010) 'The political economy of oil and gas in Southeast Asia: heading towards the natural resource curse?', *The Pacific Review,* 23(2). pp. 225–259. DOI: 10.1080/09512741003624484

Stevens, P. and Dietsche, E. (2008) 'Resource Curse: An Analysis of Causes, Experiences and Possible Ways Forward', *Energy Policy,* 36(1), pp. 56–65. DOI:10.1016/j.enpol.2007.10.003

Stijns, J.P. (2005) 'Natural Resource Abundance and Economic Growth Revisited', *Resources Policy,* 30(2), pp. 107-130. DOI: 10.1016/j.resourpol.2005.05.001

Stijns, J.P. (2006) 'Natural resource abundance and human capital accumulation', *World Development,* 34(6), pp. 1060-1083. DOI: 10.1016/j.worlddev.2005.11.005

Stoian, C. and Filippaios, F. (2007) 'Foreign Direct Investment in Central, Eastern and South Eastern Europe: An 'Eclectic' Approach to Greek Investments', *International Journal of Entrepreneurship and Innovation Management,* 8(5), pp.542-564. DOI:10.1504/IJEIM.2008.022320

Sun, D., Lu, D., Li, Y., Zhou, L. and Zhang, M. (2017) 'Energy abundance and China's economic growth: 2000–2014', *Chinese Geographical Science,* 27(5), pp. 673–683. DOI: 10.1007/s11769-017-0901-y

Sun, H., Sun, W., Geng, Y. and Kong, Y. (2018) 'Natural resource dependence, public education investment, and human capital accumulation', *Petroleum Science,* 15(3), pp. 657–665, DOI:10.1007/s12182-018-0235-0

Sun, H., Sun, W., Geng, Y., Yang, X. and Edziah, B. (2019) 'How does natural resource dependence affect public education spending?', *Environmental Science and Pollution Research,* 26(4), pp. 3666–3674. DOI: 10.1007/s11356-018-3853-6

Suslova, E. and Volchkova, N. (2012) 'Human Capital, Industrial Growth and Resource Curse', *The Economic Journal of the Higher School of Economics,* 12(2), pp. 217-238. DOI:10.2139/ssrn.1023523

Svensson, J. (2005) ‘Eight Questions about Corruption’, *Journal of Economic Perspectives,* 19(3), pp.19-42. DOI: 10.1257/089533005774357860

Taguchi, H. and Lar, N. (2016) ‘The resource curse hypothesis revisited: evidence from Asian economies’, *Bulletin of Applied Economics,* 3 (2), pp. 31-42. Available at: http://www.riskmarket.co.uk/bae/journals-articles/issues/the-resource-curse-hypothesis-revisited-evidence-from-asian-economies/?download=attachment.pdf (Accessed: 11 October 2018).

Tanzi, V. and Davoodi, H. (1997) *‘Corruption, Public Investment, and Growth’,* International Monetary Fund, Working Paper No. 97/139. DOI: 10.5089/9781451929515.001

Tebaldi, E. (2016) ‘The Dynamics of Total Factor Productivity and Institutions’, *Journal of Economic Development,* 41(4), pp.1-25. Available at: http://jed.or.kr/full-text/41-4/1.pdf (Accessed: 15 April 2019).

Tebaldi, E. and Elmslie, B. (2013) ‘Does institutional quality impact innovation? Evidence from cross-country patent grant data’, *Applied Economics*, 45(7), pp. 887-900. DOI: 10.1080/00036846.2011.613777

Temple, J. (1999) ‘A positive effect of human capital on growth’, *Economics Letters*, 65(1), pp. 131-134. DOI:10.1016/S0165-1765(99)00120-2

Temple, J. (2001) ‘Growth Effects of Education and Social Capital in the OECD Countries’, *Historical Social Research,* 27(4), pp. 5-46. Available at: https://www.jstor.org/stable/20757950 (Accessed: 11 October 2018).

The Heritage Foundation (2019) *‘2019 Index of Economic Freedom’.* Available at: https://www.heritage.org/index/ (Accessed: 27 June 2019)

The World Economic Forum (2017) ‘*The Global Human Capital Report 2017’,* Available at: https://www.weforum.org/reports/the-global-human-capital-report-2017 (Accessed: 2 October 2018).

Thyne, C.L. (2006) ‘ABC's, 123's, and the Golden Rule: The Pacifying Effect of Education on Civil War, 1980–1999’, *International Studies Quarterly*, 50(4), pp. 733–754. DOI: 10.1111/j.1468-2478.2006.00423.x

Tornell, A. and Lane, P. R. (1999) ‘The Voracity Effect’, *American Economic Review*, 89(1), pp. 22-46. DOI: 10.1257/aer.89.1.22

Torres, N., Afonso, O. and Soares, I. (2012) ‘Oil abundance and economic growth-a panel data analysis’, *The Energy Journal*, 33(2). pp. 119–148. DOI: /10.5547/01956574.33.2.6

Torres, N., Afonso, O. and Soares, I. (2013) ‘Natural resources, wage growth and institutions - a panel approach’, *World Economy*, 36(5), pp. 661–687. DOI: 10.1111/twec.12023

Torvik, R. (2002) ‘Natural resources, rent-seekingand welfare’, *Journal of Development Economics*, 67(2), pp. 455-470. DOI: 10.1016/S0304-3878(01)00195-X

Torvik, R. (2009) ‘Why do some Resource-Abundant Countries Succeed while Others do not?’, *Oxford Review of Economic Policy,* 25(2), pp. 241–256. DOI: 10.1093/oxrep/grp015

Treisman, D. (2000) ‘The causes of corruption: a cross-national study’, *Journal of Public Economics,* 76(3), pp. 399-457. DOI: 10.1016/S0047-2727(99)00092-4

Tsui, K. K., (2010) ‘Resource Curse, Political Entry, and Deadweight Costs’, *Economics & Politics,* 22(3), pp. 471-497. DOI:10.1111/j.1468-0343.2010.00373.x

Tsui, K. K. (2011) ‘More Oil, Less Democracy: Evidence from Worldwide Crude Oil Discoveries’, *The Economic Journal,* 121(551), pp. 89-115. DOI:10.1111/j.1468-0297.2009.02327.x

Ubi, P. and E. Udah, B. (2014) ‘Corruption, Institutional Quality and Economic Performance in an Emerging Economy: Lessons from Nigeria’, *British Journal of Economics, Management & Trade,* 4(11), pp. 1708-1722. DOI: 10.9734/BJEMT/2014/11091

Ugur, M. (2014) ‘Corruption's direct effects on per-capita income growth: A meta-analysis’, *Journal of Economic Surveys,* 28(3), pp. 472-490. DOI:10.1111/joes.12035

Urdal, H. (2008) ‘Population, Resources, and Political Violence: A Subnational Study of India, 1956–2002’, *Journal of Conflict Resolution,* 52(4). DOI: 10.1177/0022002708316741

U.S. Energy Information Administration, EIA (2018) *‘The world’s top crude oil producers’*. Available at: https://www.eia.gov/naturalgas/crudeoilreserves/ (Accessed: 12 June 2019).

Valeriani, E. and Peluso, S. (2011) ‘The Impact of Institutional Quality on Economic Growth and Development: An Empirical Study’, *The Journal of Knowledge Management, Economics and Information Technology,* 1(6), pp. 274–299.

Van der Ploeg, F. (2011) ‘Natural resources: curse or blessing?’, *Journal of Economic Literature,* 49(2), pp. 366-420. DOI:10.1257/jel.49.2.366

Van der Ploeg, F. and Venables, T. (2009) ‘Symposium on resource rich economies introduction’ *Oxford Economic Papers,* 61(4), pp. 625-627. DOI: 10.1093/oep/gpp022

Venables, A. J. (2016) ‘Using Natural Resources for Development: Why Has It Proven So Difficult?’, *Journal of Economic Perspectives,* 30(1), pp. 161-84.

DOI: 10.1257/jep.30.1.161

Wang, G. G., Rothwell, W. J. and Sun, J. Y. (2009) ‘Management development in China: a policy analysis’, *International Journal of Training and Development,* 13(4), pp. 205-220. DOI: 10.1111/j.1468-2419.2009.00328.x

Wang, Y., Wang, Y., Zhou, J., Zhu, X. and Lu, G. (2011) ‘Energy consumption and economic growth in China: A multivariate causality test’, *Energy Policy,* 39(7), pp. 4399-4406. DOI:10.1016/j.enpol.2011.04.063

Webb, M., Kuntuova, I. and Karabayeva, A. (2018) ‘The role of education in realising youths’ human capital: social philosophical analysis’, 26(100), pp. 968-985. DOI:10.1590/s0104-40362018002601727

Welsch, H. (2008) 'Resource Dependence, Knowledge Creation, and Growth: Revisiting the Natural Resource Curse', *Journal of Economic Development*, 33(1), pp. 45–70. Available at: http://www.jed.or.kr/full-text/33-1/3.pdf (Accessed: 4 October 2017).

Williams, A. (2011) 'Shining a light on the resource curse: an empirical analysis of the relationship between natural resources, transparency, and economic growth', *World Development*, 39(4), pp. 490-505. DOI:10.1016/j.worlddev.2010.08.015

Woessmann, L. (2002) *'Schooling and the Quality of Human Capital'*. Berlin: Springer.

Woessmann, L. (2003) 'Specifying human capital', *Journal of Economic Surveys*, 17(3), pp. 239–270. DOI: 10.1111/1467-6419.00195

Wolf, A. (2002) *'Does Education matter? Myths about Education and Economic Growth*', London: Penguin.

Wolfowitz, P. (2006) '*Good governance and development: a time for action, Jakarta, Indonesia: remarks by President, Paul Wolfowitz*', Presidential speech. Washington, D.C.: World Bank Group. Available at: http://documents.worldbank.org/curated/en/938181467987875500/Good-governance-and-development-a-time-for-action-Jakarta-Indonesia-remarks-by-President-Paul-Wolfowitz (Accessed: 2 May 2019).

Woodhall, M. (2001) 'Human capital: educational aspects', in Wright, J.D. (ed.) *International Encyclopedia of the Social & Behavioral Sciences.* DOI: 10.1016/B0-08-043076-7/02469-4

Woolcock, M., Pritchett, L. and Isham, J. (2001) 'The Social Foundations of Poor Economic Growth in Resource-Rich Countries', in Auty, R. (ed.) *Resource Abundance and Economic Development.* Oxford: Oxford University Press. pp 76-92.

World Atlas (2019) *'Kuwait'*. Available at: https://www.worldatlas.com/webimage/countrys/asia/kw.htm (Accessed: 20 May 2019).

World Atlas (2019) *'Saudi Arabia'*. Available at: https://www.worldatlas.com/webimage/countrys/asia/sa.htm (Accessed: 21 May 2019).

World Atlas (2019) *'United Arab Emirates'*. Available at: https://www.worldatlas.com/webimage/countrys/asia/ae.htm (Accessed: 21 May 2019).

World Bank (2017) '*World Development Indicators, (WDI)'*, Available at: www.data.worldbank.org (Accessed: 4 December 2017).

World Bank (2017) 'GDP (PPP) per capita'. Available at: https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.KD. (Accessed: 10 May 2018).

World Bank (2017) *'GDP (constant 2010 US$)'*. Available at: https://data.worldbank.org/indicator/NY.GDP.MKTP.KD (Accessed: 10 May 2018).

World Bank (2019) 'Middle East & North Africa'. Available at: https://data.worldbank.org/region/middle-east-and-north-africa?view=chart (Accessed: 13 June 2019).

World Bank (2019) '*GDP per person employed (constant 2011 PPP $)'*. Available at: https://data.worldbank.org/indicator/ (Accessed: 13 June 2019).

World Economic Forum (2017) *'The Global Human Capital Report'*. Available at: http://www3.weforum.org/docs/WEF_Global_Human_Capital_Report_2017.pdf (Accessed: 6 December 2018).

WorldOilTraders.com (2018) *'Crude oil prices react to geopolitical and economic events'*. Available at: https://www.worldoiltraders.com/what-drives-crude-oil-prices/ (Accessed: 1 June 2019).

Yang, B. (2010) 'Resource curse: the role of institutions versus policies', *Applied Economics Letters,* 17 (1), pp. 61–66. DOI: 10.1080/13504850701719736

Yuxiang, K. and Chen, Z. (2011) 'Resource abundance and financial development: evidence from China', *Resources Policy*, 36(1), pp. 72-79. DOI: 10.1016/j.resourpol.2010.05.002

Zalle, O. (2019) 'Natural resources and economic growth in Africa: The role of institutional quality and human capital', *Resources Policy*, 62(C), pp. 616-624. DOI:10.1016/j.resourpol.2018.11.009

Zubikova, A. (2017) 'Resource curse: Case study of Nigeria', *Proceedings of Economics and Finance Conferences*. 4507411, International Institute of Social and Economic Sciences. Available at: https://iises.net/proceedings/8th-economics-finance-conference-london/table-of-content/detail?cid=48&iid=016&rid=7411 (Accessed: 9 July 2019).

# APPENDICES

## Appendix A.

### Economic Background of Case Study Countries

This section is constructed in two parts. The first part lays out the selected socio-economic statistics on the selected oil-exporting Gulf Countries, and the second part displays the reasons we choose the countries under investigation. The paper focused on countries from the Middle East, more precisely from the Gulf region including the State of Kuwait (KWT), the Kingdom of Saudi Arabia (KSA), and the United Arab Emirates (UAE). These states are members of the Gulf Cooperation Council (GCC), which is an Arabian organization consisting of six Gulf Countries: the KSA, the UAE, Qatar, KWT, Bahrain, and Oman. Moreover, they are important members of the Organization of Petroleum Exporting Countries (OPEC, 2019).

The three countries are similar in the challenges they face as well as their non-renewable natural resource wealth. They are known to be heavily dependent on their natural resources, which form the base of their economic prosperity (Tables A1.2–1.4). Thus, their fiscal revenue, export revenue, foreign exchange, and any other economic activity are dependent on the production of natural resources, either directly or indirectly (IMF, 2019). Therefore, the depletion of these natural resources is a serious economic issue for all three countries, which necessitates diversification (Hvidt, 2013) and the promotion of inclusive growth. Another challenge is related to the price volatility of these resources in the global market, so these governments need to shield their economy from this volatility. Despite several crises, as presented in Figure (A1.1), the upward trend in oil prices continues to increase rapidly, which assists in producing relatively large revenues for oil dependent countries. Nevertheless, prices have remained volatile due to major economic and geo-political factors (SAMA, 2019).

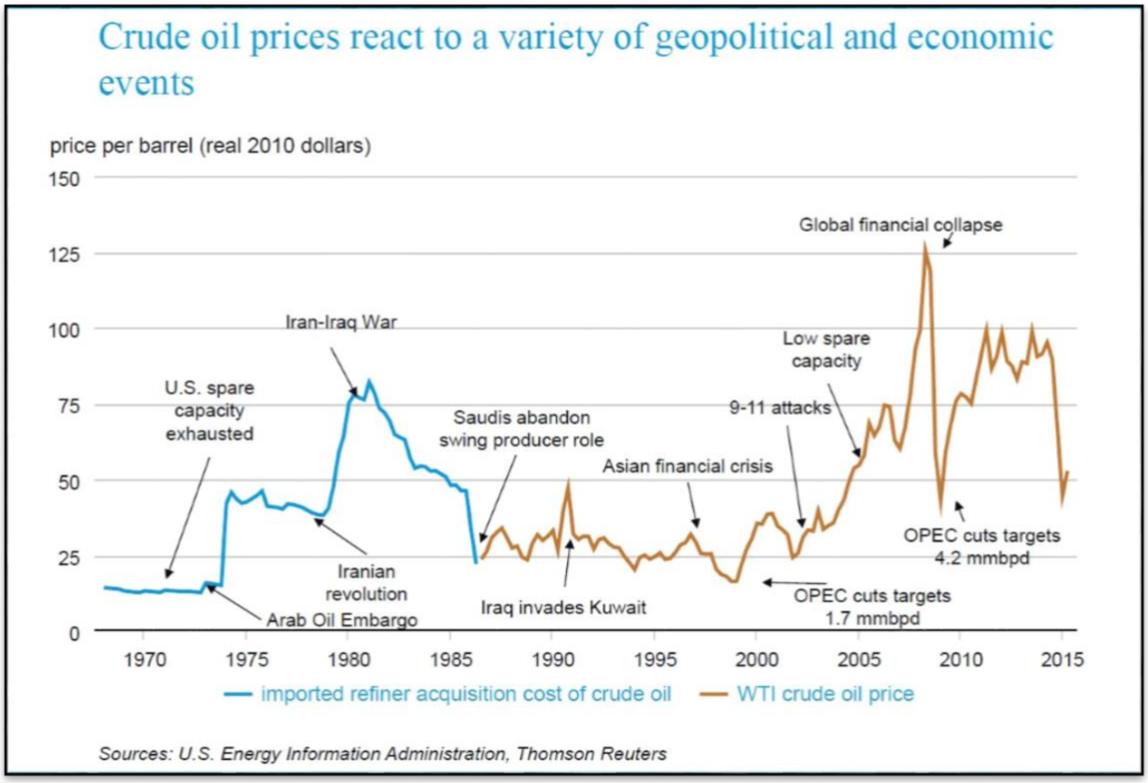



**Figure A1.1** Crude oil prices react to geopolitical and economic events

Source: World Oil Traders (2018)

Finally, the populations in these countries are young and rapidly growing, hence there is a need to create jobs to ensure employment. These countries rely heavily on foreign labor, with migrants representing more than half of the total population in these countries (PACI, 2018; IMF, 2019).

Table (A1.1) provides a summary of the most important economic indicators across the three case studies. As these indicators vary in each country, the findings are expected to vary, and the policy recommendations need to be tailored to meet the country's conditions.

**Table A1.1 Summary of the most important economic indicators.**

| Stat | Kuwait | Kingdom of Saudi Arabia | United Arab Emirates |
|---|---|---|---|
| **Location** | Middle East, bordering the Arabian Gulf, between Saudi Arabia and Iraq | Middle East, bordering the Red Sea and the Arabian Gulf, north of Yemen | Middle East, bordering the Arabian Gulf and the Gulf of Oman and the, between Oman and Saudi Arabia |
| **Total Area** | 17,818 sq. km | 2.15 million sq. km | 83,600 sq. km |
| **Population** | 2.7 m. | 26.94 m. | 5.47 m. |
| **GDP** | $160.91 b. | $711.05 b. | $348.59 b. |
| **Per capita GDP** | $51,496.93 | $25,136.21 | $39,057.84 |
| **GDP (Purchasing Power Parity)** | $150.90 billion | $883.70 billion | $255.80 billion |
| **Budget (Revenues)** | $115.80 billion | $326.50 billion | $136.60 billion |
| **Budget surplus or deficit** | 31.7% of GDP | 13.1% of GDP | 7.2% of GDP |
| **Inflation Rate (Consumer prices)** | 2.9% | 2.9% | 0.7% |
| **Unemployment Rate** | 2.2% | 10.6% | 2.4% |
| **Exports (Main exports)** | Oil | Oil, gas, cereals | Oil, gas |

| | | | |
|---|---|---|---|
| **Exports (Commodities)** | Oil and refined products, fertilizers | Petroleum and petroleum products 90% | Crude oil 45%, natural gas, reexports, dried fish, dates |
| **Human Development Index** | 0.844 | 0.772 | 0.849 |
| **Imports** | $22.79 billion | $141.80 billion | 221.90 billion |
| **Exports** | $121.00 billion | $388.40 billion | $350.10 billion |
| **Industries** | Petroleum, petrochemicals, cement, shipbuilding and repair, water desalination, food processing, construction materials | Crude oil production, petroleum refining, basic petrochemicals, ammonia, industrial gases, fertilizer, sodium hydroxide (caustic soda), cement, plastics, metals, commercial aircraft repair, construction, commercial ship repair, | Petroleum and petrochemicals; fishing, aluminum, cement, fertilizers, commercial ship repair, construction materials, some boat building, handicrafts, textiles |
| **Natural Resources** | Petroleum, fish, shrimp, natural gas | Petroleum, natural gas, iron ore, gold, copper | Petroleum, natural gas |

Source: SAMA, 2019; PACI, 2018; CIA, 2018; OPEC, 2019; World Bank, 2019

## 1.1. Case Study 1: Kuwait

The State of Kuwait is geographically relatively small, but wealthy with proven oil reserves in excess of 102 billion barrels, about 7% of the global reserves. KWT has the largest share of oil revenue as a proportion of its economy in the Gulf region. Oil accounts for nearly half of the country's GDP, 92% of export revenue, and around 90% of government income (CIA, 2018; World Bank, 2019), which highlights the critical role of these resources to the country. Table (A1.2) presents the sector's share in GDP as well as the share of employment in each of these sectors (CIA, 2018; World Bank, 2019).

| Table A1.2. Share of the economic sectors in the GDP of Kuwait in 2014. | | | |
|---|---|---|---|
| **Sector** | **Agriculture** | **Industry** | **Services** |
| **% GDP** | 0.45% | 70.54% | 42.17% |
| **% Employment** | 2.7% | 27.6% | 69.8% |
| Source: World Bank, 2019; CIA, 2018 | | | |

The upsurge in the global demand and oil prices during 2011 and 2012 benefited Kuwait as it experienced a 20% rise in revenue, relative to the levels obtained in 2010. This rise was critical in leading to higher government expenditure and economic growth, especially given the increase in public sector wages (CIA, 2018; IMF, 2019). However, Kuwait achieved relatively little diversification due to its poor business environment and the historically acrimonious relationship between the Executive Branch and National Assembly that has obstructed most of the efforts and movements of economic reform (Barakat and Skelton, 2014).

Kuwait and the other GCC nations are very similar in many ways as they share the same language, culture, and religion. In addition, they share a very similar economical perspective as they are all resource rich countries. However, the most important differentiating feature of Kuwait is that it is a constitutional monarchy and the most democratic of the three, while the other two cases are absolute monarchies where democracy is very limited (Barakat and Skelton, 2014). Another very significant difference is Kuwait's geographical location. Kuwait's only two land borders are with the Kingdom of Saudi Arabia and the Republic of Iraq and is located at the top of the Arabian Sea, which has resulted in Kuwait enjoying a very strategic location to access the region (CIA, 2018).

### 1.2. Case Study 2: The Kingdom of Saudi Arabia

The Kingdom of Saudi Arabia is the largest country in the Middle East, the fourteenth in the world, and the second largest OPEC member country (OPEC, 2019). Saudi Arabia (SA) is considered a regional power. It governs the two holiest places in Islam and is called "The Land of the Two Holy Mosques" in reference to Al-Masjid Al-Haram in Mecca and Al-Masjid Al-Nabawi in Medina, making it famous for its religious tourism (CIA, 2018).

With regard to its economy as of October 2018, the KSA was the largest and the strongest Arabian economy in the Middle East as well as being the largest producer and exporter of oil in the world. In terms of the economic importance of its natural resource wealth, oil accounts for roughly 90% of its export earnings, 42% of its GDP, and around 87% of government earnings. The KSA possesses the world's second largest oil reserves and the sixth largest gas reserves. Between 1970 and 2011, the government took advantage of the increase in oil prices in the global market and reached remarkable economic growth (CIA, 2018; MEP, 2018). The share of the sectors in the GDP of the KSA and the share of employment in each of these sectors (CIA, 2018; World Bank, 2019) are presented in Table (A1.3).

**Table A1.3. Share of the economic sectors in the GDP of Saudi Arabia in 2014.**

| Sector | Agriculture | Industry | Services |
|---|---|---|---|
| **% GDP** | 2.22% | 57.17% | 40.59% |
| **% Employment** | 6.1% | 22.7% | 71.2% |

Source: CIA, 2018; World Bank, 2019

Diversification efforts have been directed toward telecommunications, the petrochemical sectors, power generation, and the exploration of natural gas. One of the main diversification efforts is encouraging the development of the private sector as well as providing its large youth population with jobs (Forbes, 2019; Nieva, 2015). The government has started to assign some of its economic activities to the private sector including postal services, telecommunications, railways, airlines, and electricity (Ministry of Commerce and Investment, 2018), which has granted the private sector with more opportunities. These positive vital changes in the economic structure such as increasing the private sector contribution to the GDP led to the KSA joining the World Trade Organization (WTO) in 2005 (MEP, 2018; SAMA, 2019).

### 1.3. Case Study 3: The United Arab Emirates

The United Arab Emirates (UAE) has the second largest Arabian economy in the Middle East. The UAE consists of seven emirates: Abu Dhabi (the capital city), Dubai (the business capital), Sharjah, Fujairah, Ajman, Umm Al-Qaiwain, and Ras Al-Khaimah. Abu Dhabi is the richest emirate in natural resources and has contributed the most to the country's GDP.

It has an open economy with a large trade surplus and a high income per capita. Approximately, oil accounts for 30% of its GDP (CIA, 2018). Table (A1.4) shows the share of the different sectors in the UAE and the share of employment in each sector.

**Table A1.4. Share of the economic sectors in the GDP of the United Arab Emirates in 2014.**

| Sector | Agriculture | Industry | Services |
|---|---|---|---|
| **% GDP** | 0.64% | 52.78% | 46.58% |
| **% Employment** | 3.6% | 21.5% | 74.9% |

Source: CIA, 2018; World Bank, 2019

Since the discovery of oil, the country has experienced a profound transformation from an underprivileged region consisting of small desert territories to a modern country with high living standards. The government has increased its expenditure to create jobs, build and expand infrastructure, and involve the private sector with different utilities. Great opportunities have been given to the private sector, which has increased its contribution to the total economic investment (Ministry of Economy, 2018). As a result, the UAE became a member of well-known international organizations such as the General Agreement on Tariffs and Trade (GATT) in 1994, the World Trade Organization (WTO) in 1996, and The Organization of the Petroleum Exporting Countries (OPEC) in 1967 (Hvidt, 2013).

Since 2008, the government of the UAE has achieved impressive economic diversification, orientating its economy toward tourism and foreign trade. These diversification efforts have reduced the share of oil and gas production in its GDP to 30% (CIA, 2018). Moreover, as a way to attract foreign investors, the government has offered 100% foreign ownership and zero taxes in Free Trade Zones **(**Ministry of Economy, 2018).

Several factors strained the UAE economy in 2009, mainly due to the global financial crisis, constricted international credit, and the depressed prices of assets. To blunt the impacts of this crisis, the authorities boosted its liquidity in the banking sector and increased spending. The crisis hit Dubai the hardest due to its heavy exposure to deflated real estate prices while it lacked the cash needed to meet its debts. As a result, the Central Bank of the UAE and Abu Dhabi-based banks bought large shares that injected $10 billion into Dubai as loans from Abu Dhabi; hence, the significant importance of the emirate of Abu Dhabi to the UAE economy. Like other resource rich countries, the UAE has a strategic plan that focuses most on diversification, education, technology, and private sector involvement **(**Ministry of Economy, 2018).

## 2. The Importance of the Selected Countries

First of all, these countries are of significant importance for the Middle East in particular, and the entire world in general. Despite their diversity in demographics, size, and wealth, they all demonstrate the same wealth of natural resources as they have the largest proven oil reserves in the world, as shown in Table (A1.5).

**Table A1.5. The world's largest proven crude oil reserves.**

| Rank | Country | Reserves (billion barrels) |
|---|---|---|
| 1 | Venezuela | 300,878 |
| 2 | Saudi Arabia | 266,455 |
| 3 | Canada | 169,709 |
| 4 | Iran | 158,400 |
| 5 | Iraq | 142,503 |
| 6 | Kuwait | 101,500 |
| 7 | United Arab Emirates | 97,800 |
| 8 | Russia | 80,000 |
| 9 | Libya | 48,363 |
| 10 | United States | 39,230 |
| 11 | Nigeria | 37,062 |
| 12 | Kazakhstan | 30,000 |
| 13 | China | 25,620 |
| 14 | Qatar | 25,244 |
| 15 | Brazil | 12,999 |

Source: EIA, 2018; OPEC, 2019

Therefore, they are also important members in the Organization of Petroleum Exporting Countries (OPEC). OPEC is a stable intergovernmental organization, created in 1960 by five founding members: Saudi Arabia, Kuwait, Iran, Iraq, and Venezuela, followed by another ten members who later joined the organization. OPEC was created with one main objective: to co-ordinate and unify petroleum policies between member countries, as this would secure stable and fair prices for petroleum producers from one angle. Regarding the consuming countries, OPEC secures a regular, efficient, and economic supply of petroleum. Furthermore, it secures a fair return on capital for the investors in the industry.

Since 1960, as a founding member of OPEC, the KSA has aimed to stabilize the world's oil market by following a certain oil pricing policy. Furthermore, the KSA plays a leading role in OPEC as it owns 17% of the oil reserves in the world and is ranked as the largest oil exporter globally (OPEC, 2019; EIA, 2018).

The KSA and the UAE were selected as case studies since they have the strongest economies among the Gulf Countries. The KSA is ranked first for GDP and the UAE is in second, as presented in Figure (A1.2). The merged GDP of the UAE and the KSA represent nearly 70% of the Gulf Countries' total GDP, hence they are the most dominant economies in the region (World Bank, 2019; IMF, 2019).

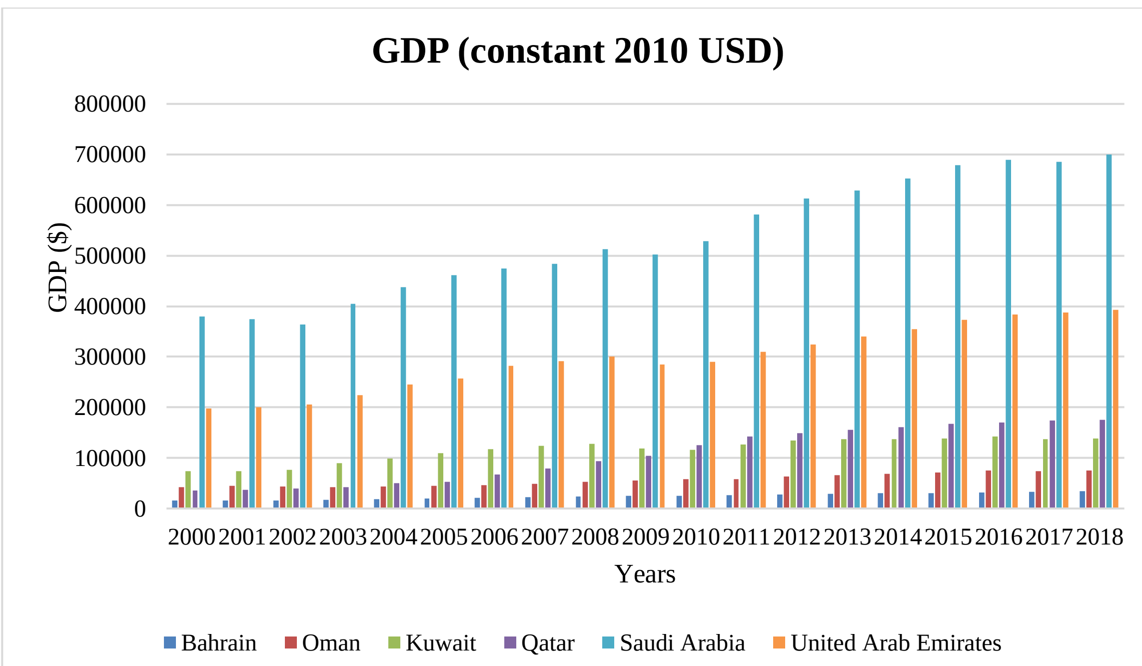



**Figure A1.2.** GDP in Gulf Countries.
Source: World Bank (2017).

Figure (A1.3) reveals the GDP trend (constant 2010D) among the three Gulf Countries.

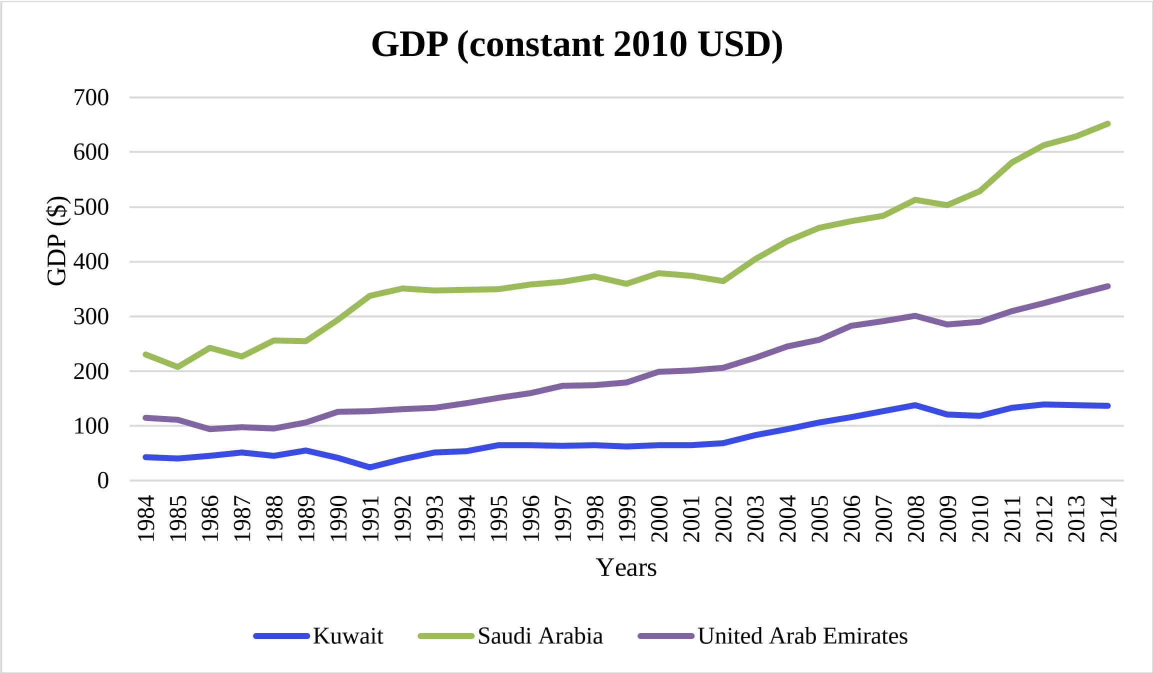



**Figure A1.3.** GDP trend (constant 2010 USD) among the three Gulf Countries under study. Source: FRED (2018).

In contrast, Kuwait ranks eighth in GDP (PPP) per capita in the world (Table A1.6) and the second in the Gulf region after Qatar since 2008, as shown in Figure (A1.4) (World Bank, 2017).

**Table A1.6. List of countries by GDP (PPP) per capita.**

| Rank | Country | US Dollars ($) |
|---|---|---|
| 1 | Qatar | 128,378 |
| 2 | Macau | 115,123 |
| 3 | Luxembourg | 103,662 |
| 4 | Singapore | 93,905 |
| 5 | Brunei | 78,836 |
| 6 | Ireland | 76,305 |
| 7 | United Arab Emirates | 73,879 |
| 8 | Kuwait | 71,943 |
| 9 | Switzerland | 65,006 |
| 10 | San Marino | 62,425 |

Source: World Bank (2017)

Another significant fact about the three countries is that they are the top oil producers in the world. The KSA is the second largest oil producer after the United States, followed by Russia (EIA, 2018), whereas the UAE ranks eighth with Kuwait in tenth place (Table A1.7).

**Table A1.7. The largest oil producers in the world.**

| Rank | Country | Million barrels per day | Share of world total |
|---|---|---|---|
| 1 | United States | 17.87 | 18% |
| 2 | Saudi Arabia | 12.42 | 12% |
| 3 | Russia | 11.40 | 11% |
| 4 | Canada | 5.27 | 5% |
| 5 | China | 4.82 | 5% |
| 6 | Iraq | 4.62 | 5% |
| 7 | Iran | 4.47 | 4% |
| 8 | United Arab Emirates | 3.79 | 4% |
| 9 | Brazil | 3.43 | 3% |
| 10 | Kuwait | 2.87 | 3% |

Source: EIA, 2018; OPEC, 2019

Per capita GDP varies significantly among the Gulf Countries (Figure A1.4), and is fairly high across the three selected countries, which is above the world average per capita GDP (PPP) of US $17,300 as of 2017 (CIA, 2018).

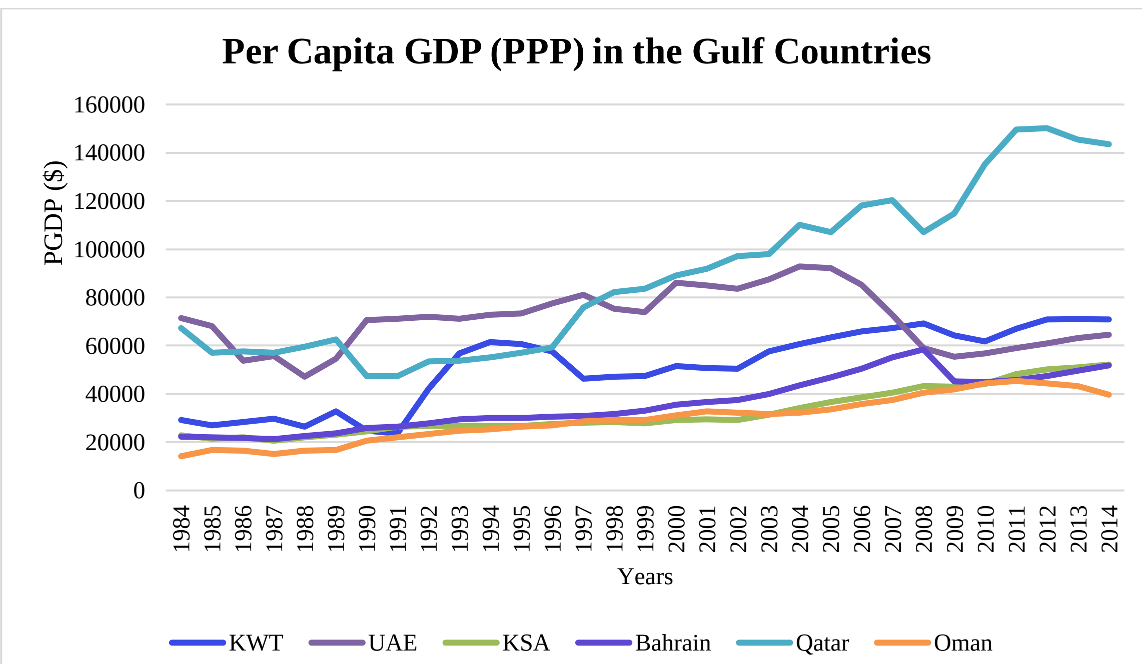



**Figure A1.4.** Per Capita GDP (PPP) in all the Gulf Countries.
Source: World Bank, 2017; CIA, 2018.

Figure (A1.5) shows the per capita GDP (constant 2010 USD) trend between the three GCs.

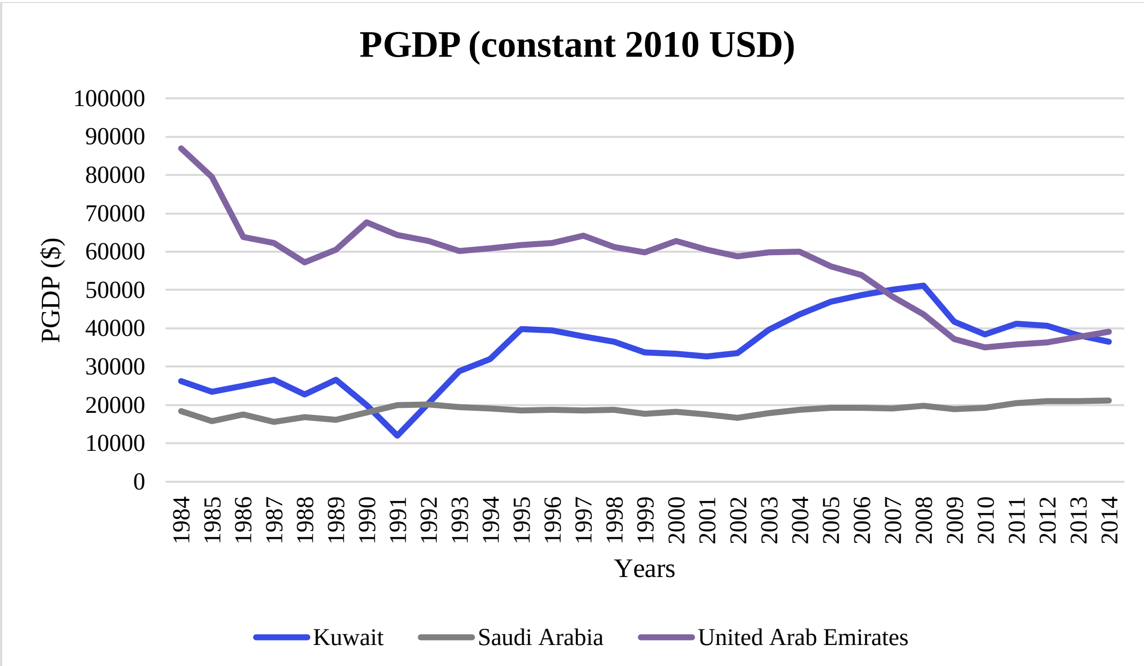



**Figure A1.5.** Per capita GDP (constant 2010USD) in the three Gulf Countries.
Source: FRED (2018), CIA (2018).

Although GDP is the most commonly used measure to compare countries, per capita GDP is a better indicator of a country's living standards because it adjusts the GDP to the population. Figure (A1.5) shows that KWT enjoyed high levels of PGDP for a long period of time, with the main two reasons being that KWT covers a small area and has a relatively small population in comparison to the KSA and the UAE.

## 3. Summary

This Appendix has provided a brief overview of the three most important economies in the Gulf region and the Arab world. The data justified the significance of the three countries selected when compared to the other Gulf Countries.

As with KWT, the UAE, and the KSA, before the discovery of oil, their economies were dependent on non-oil sectors, i.e., trade and fishing. However, after the discovery of oil, the situation changed dramatically, and they have since experienced exceptional boom and have started to become famous as oil producing countries (CIA, 2018).

Today, although all authorities have been keen to diversify their economies, their attempts have faced major shortcomings. These countries are considered as fertile cases to study and to benefit from, as their experiences sketch the road for other countries to understand approaches to diversification as well as the instability of economies that rely on natural resources (Hvidt, 2013).

As history shows, countries that rely heavily on natural resource revenues in their process of economic growth should look for another source of revenue that is controllable so that they are not exposed to the phenomena of the resource curse. This is known as the negative consequences of over reliance on one non-renewable asset as a source of income for the country. Thus, the impact of natural resources on growth has been questioned in many studies since the 1990s, and the picture of the resource curse has been expanded to include other factors that could be harmed by natural resource wealth, which would then hurt growth and development. As such, the most important questions that have arisen are what these factors are, and what their impacts are on other aspects of the economy that could affect growth and productivity in resource rich countries (Badeeb et al., 2017).

From the resource curse literature, our hypothesis was built upon the question of whether human capital, institutional quality, or natural resources were crucial factors in improving productivity and growth, and which factor has more influence on the economy in a country that is rich in non-renewable natural resources.

# Appendix B.

**Table B1. Descriptive Analysis.**

| Country / Variable | Kuwait | | | The Kingdom of Saudi Arabia | | | The United Arab Emirates | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Mean** | **Max.** | **Min.** | **Mean** | **Max.** | **Min.** | **Mean** | **Max.** | **Min.** |
| **Per capita GDP($)** | 40927 | 49588 | 35051 | 18654 | 21183 | 15608 | 56793 | 86936 | 35049 |
| **Capital Stock ($)** | 234524 | 480644 | 14698 | 2787272 | 5214103 | 1928750 | 1303207 | 2364226 | 760557 |
| **Resource Rents (% of GDP)** | 38.54 | 60.58 | 7.19 | 33.49 | 53.96 | 16.20 | 19.77 | 32.58 | 9.04 |
| **Corruption Index** | 2.72 | 3.0 | 2.0 | 2.21 | 3.33 | 2.0 | 2.51 | 3.54 | 2.0 |
| **Law and Order Index** | 4.36 | 6.0 | 1.75 | 4.68 | 5.50 | 3.0 | 3.73 | 4.0 | 2.66 |
| **Human Capital Index** | 2.06 | 2.20 | 1.90 | 2.22 | 2.60 | 1.83 | 2.40 | 2.73 | 1.76 |

**Table B2. Results of Production Function.**

| Variable | Coefficient | t-Statistic | Prob. |
|---|---|---|---|
| **Capital Stock** | 0.832177 | 47.40277 | 0.0000 |
| **Labor Force** | 0.024527 | 1.499516 | 0.1445 |
| | | | |
| **R-squared** | | | **0.90** |

**Table B.3. Results of the Phillips–Perron Unit Root Test.**

| Country / Variable | Kuwait | | The Kingdom of Saudi Arabia | | The United Arab Emirates | |
|---|---|---|---|---|---|---|
| | **Level** | **1st Difference** | **Level** | **1st Difference** | **Level** | **1st Difference** |
| **Per capita GDP** | -2.192 (0.212) | -4.810*** (0.000) | -1.866 (0.342) | -8.718*** (0.000) | -2.133 (0.233) | -3.753*** (0.008) |
| **Human Capital** | -1.362 (0.587) | -2.946*** (0.004) | 0.638 (0.988) | -4.093** (0.003) | -0.480 (0.881) | -2.761* (0.075) |
| **Resource Rents** | -3.181** (0.031) | | -3.577** (0.049) | | -2.902** (0.056) | |
| **TFP** | -1.851 (0.349) | -4.769*** (0.000) | -1.247 (0.640) | -7.219*** (0.000) | -2.070 (0.257) | -3.974*** (0.004) |
| **Law and Order** | -1.732 (0.405) | -3.649** (0.010) | -2.118 (0.239) | -5.375** (0.000**) | -2.424 (0.143) | -5.667** (0.000) |
| **Corruption** | -2.426 (0.143) | -5.435*** (0.000) | -3.550* (0.051) | -5.257*** (0.000) | -0.968 (0.751) | -4.025*** (0.004) |
| **Capital Stock** | -3.253** (0.026) | | -3.395** (0.019) | | 0.710 (0.999) | -3.221* (0.090) |

The values in the parentheses represent the P-value. * is 10% significance, ** is 5% significance; and *** is 1% significance.

# Appendix C.

## Economic Perspectives

### 1. Further analysis of the results when PGDP is the dependent variable:

The figures presented in this section present the data clearly to facilitate the understanding of the three different economies and highlight the results for the selected period.

#### 1.1 Kuwait

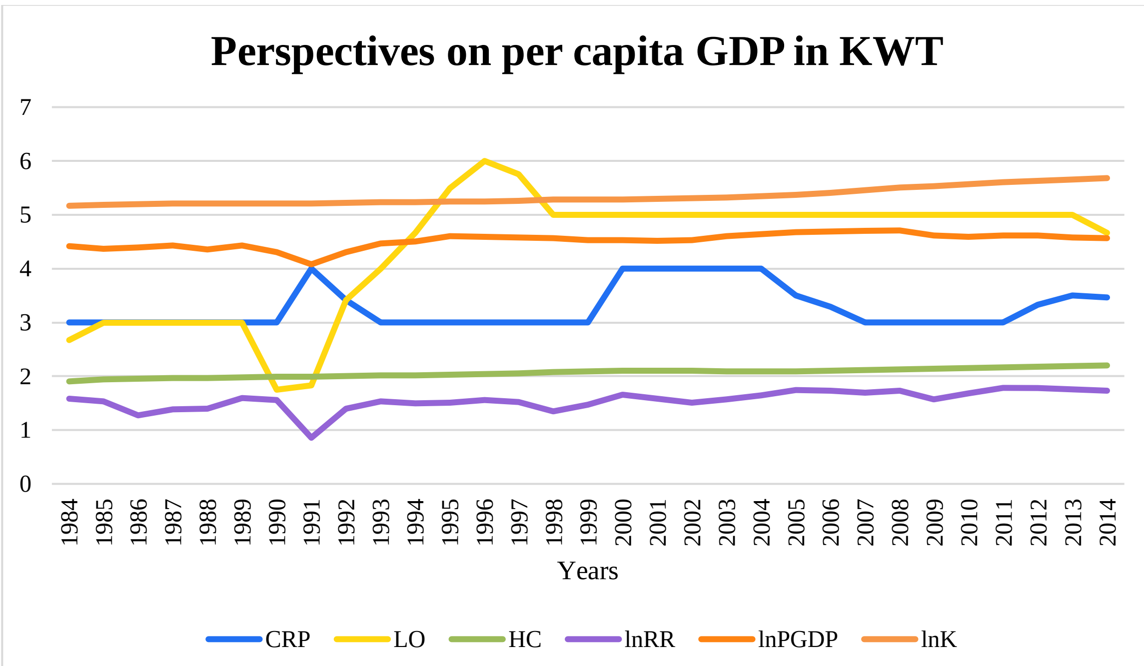



**Figure C1.** The Perspectives of per capita GDP in KWT.
Source: calculated by the author.

Figure (C1) succeeds in mirroring our findings that improvement in human capital, capital stock, law and order, and resource rents cause an increase in PGDP, while corruption causes a decline in PGDP. Thus, the figure indicates that all the variables are correlated with PGDP. It is observed that the period between 1990 and 1991 was exceptional for KWT because of the Gulf War. KWT faced a huge decline in oil production after the war when the Iraqi forces set fires in 650 oil wells. Hence, the figure clearly shows that, in 1991, resource rents were declining, the law and order situation was deteriorating, and corruption was peaking. Furthermore, PGDP was declining in that period, but its decline was less extensive than that of the other variables. There are other factors that were safeguarding the level of PGDP and helped maintain it. Two of the factors that are examined in this study reveal dominant effects on PGDP; these two factors are human capital and capital stock, which were continually increasing throughout the period of study. Moreover, during the period of 1993–1998, law and order and resource rents were high, while corruption was low. Hence, it is witnessed that PGDP was also improving during that period.

Another important period to examine is the year of the crisis in 2008 when resource rents and PGDP were affected negatively by the reduction in energy demand worldwide.

The period of 2011–2013 is critical: resource rents (% of GDP) and law and order were declining, corruption was increasing, and consequently, PGDP was negatively affected and decreasing, although the decline was not drastic because of the human and physical capital, which are found to enhance PGDP in the results of the model. These findings lead to the conclusion that the accumulation of human and physical capital is a possible solution to compensate for the negative shocks in the economy.

### 1.2 The Kingdom of Saudi Arabia

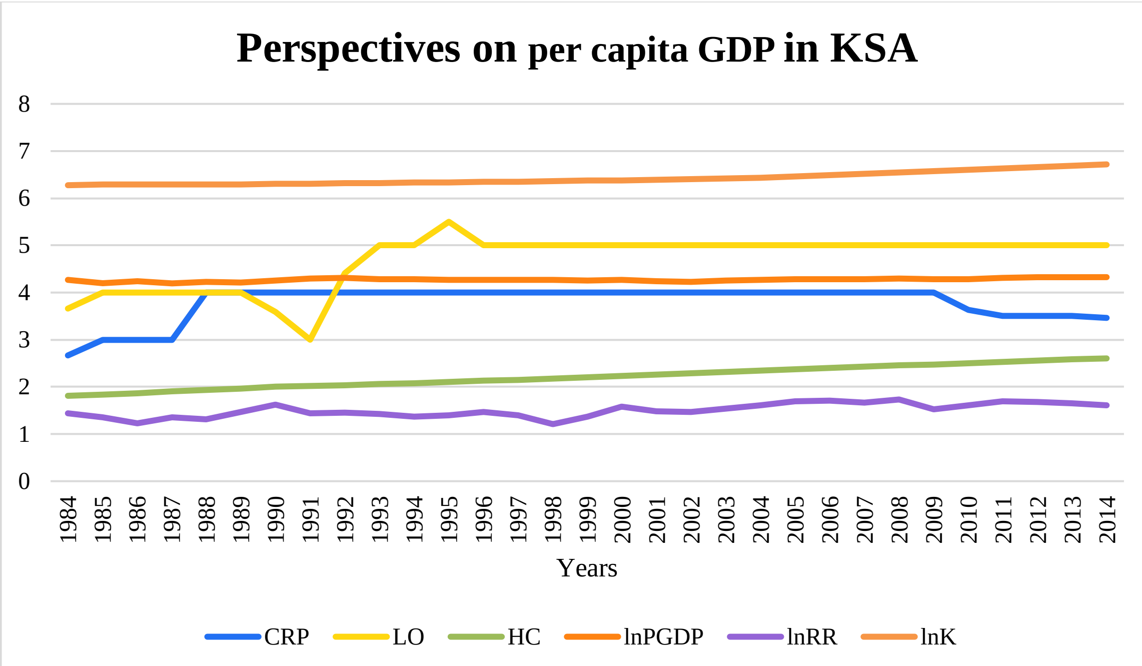



**Figure C2.** The Perspectives of per capita GDP in KSA.
Source: calculated by the author.

Figure (C2) of KSA presents the structured regression findings. Starting with the resource rents, the figure demonstrates the influence of resource rents on PGDP during the study period. PGDP is not as volatile as the resource rents, except for the period from 1984 to 1991, during which the volatility of the resource rents was highly correlated with PGDP. After that, it is observed from the figure that resource rents, as well as PGDP, were declining in 2000 and 2001.

The model suggests that natural wealth in KSA contributes positively to its economy in the long-run, but this slows down because of the negative impact of the one-year lag of resource rents on PGDP. Moreover, the results show that PGDP in KSA is less dependent on natural resource rents compared with that in KWT. As can be realized from Figure (C2), during the

2008 crisis, PGDP in KSA was less affected by the energy price drop compared with that in KWT. This is related to the fact that PGDP depends on other economic factors, such as capital stock and human capital, that were constantly improving during this period in KSA, which confirms the findings.

Further, PGDP was declining in 1984–1985 when law and order were improving. Then, in 1989–1991, PGDP was improving when law and order were declining, and it reached its lowest point in 1991. After that, law and order started increasing in 1992, whereas PGDP was moderately decreasing until 2002. It is clear that law and order have been constant since 1996; hence, no changes occurred in the legal system and the enforcement of laws. This reflects a negative but weak relationship that supports the insignificant results revealed in the model.

In regard to corruption, the negative relationship in the findings is reflected in the graph at several intervals. At the start of the period of 1984–1985, corruption increased, while PGDP decreased. Then, corruption remained constant until 1987, and then it started peaking. In 1988, when corruption reached the highest level in the period under study, it stayed constant until 2009, whereas PGDP was fluctuating with a decreasing trend. Another important period was between 2009 and 2014: when corruption started decreasing, PGDP slightly improved.

This brief analysis of Figure (C2) confirms the regression results that show that an increase in resource rents (% of GDP) cause an increase in PGDP in the long-run. Similarly, improvements in human capital and capital stock contribute positively to PGDP. However, corruption is hurting PGDP in KSA.

### 1.3 The United Arab Emirates

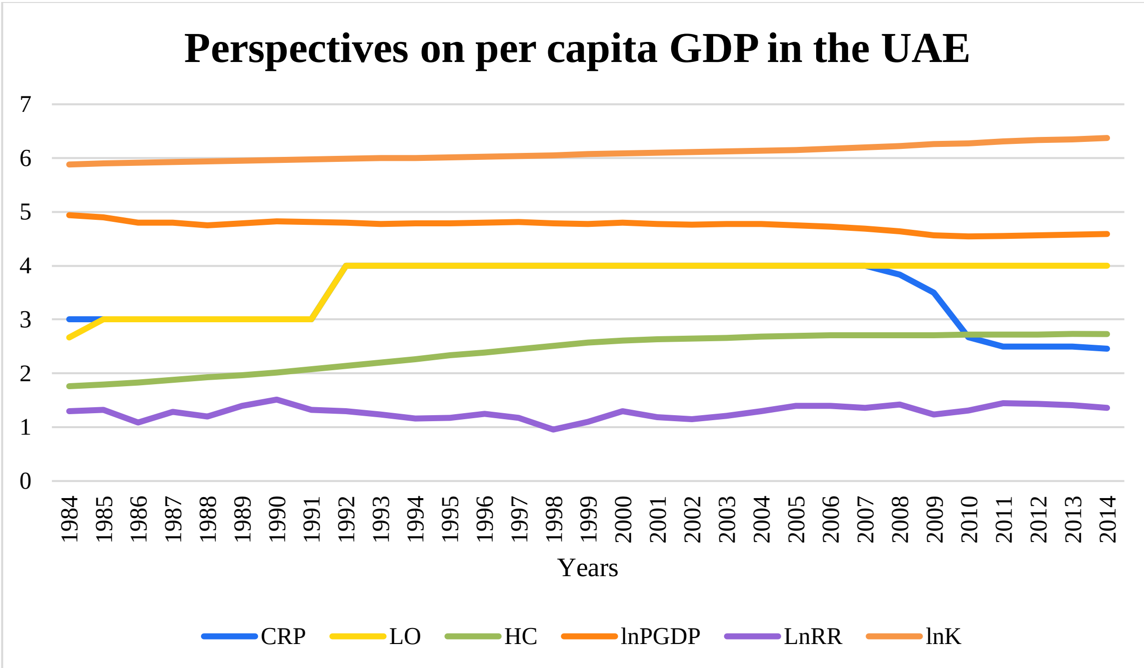



**Figure C3.** The Perspectives of per capita GDP in UAE.
Source: calculated by the author.

Figure (C3) represents the findings of the study clearly. It shows that resource rents (% of GDP) are positively correlated with PGDP, similar to the model results. Although the resource rents demonstrate strong fluctuations between 1984 and 2014, the fluctuations are less apparent in PGDP. This could be related to the negative impact of the one-year lag form of resource rents on PGDP. PGDP in the UAE appears to be less dependent on natural resources compared with that in the other studied countries, such as KWT. The figure shows that, during the 2008 crisis, PGDP was less affected by the energy price drop compared with the effect in KWT. This indicates that PGDP in the UAE is dependent on other factors, such as capital stock, human capital, and institutional quality, namely, law and order. In the figure, these factors are seen to be improving during the study period. One noticeable event is in the period between 1991 and 2007, during which corruption was slightly increasing at the beginning of the period, and then remained constant until 2007 when it started decreasing, but this change in corruption did not have any influence on PGDP. This confirms the estimated results of this study since corruption is revealed to be insignificant, while other factors, such as human capital in the long-run and capital stock in the short-run, are significant and correlated positively with PGDP. During the crisis in 2008, as well as in 1990 during the Gulf War, PGDP was experiencing a noticeable decline. However, it is believed that human capital combatted the expected drastic decline in PGDP. It is evident that when law and order were improving, PGDP was declining in 1984, and it decreased again in 1991 when law and order reached its highest level and remained constant, PGDP was declining until the end of the period. This negative relationship supports the findings of the negative impact of the one-year lag of law and order on PGDP, and the relationship becomes positive in the long-run. As a result, the fluctuations in PGDP in the upward or downward trend are controlled and not rapid.

## 2. Further analysis of the results with TFP as the dependent variable:

This section includes a comparison between the results and the illustrative figures of the data, because it is a great advantage for understanding the three different cases under study.

### 2.1 Kuwait

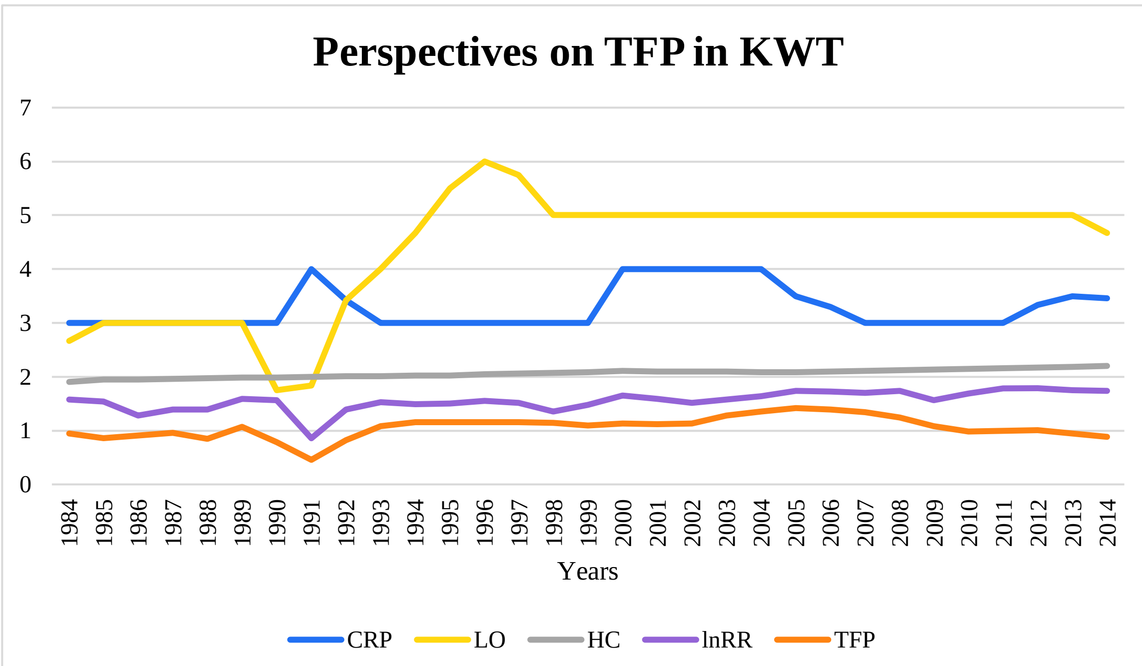



**Figure C4.** The Perspectives of TFP in KWT.
Source: calculated by the author.

The above figure shows very interesting insight into the economic and social dynamics of Kuwait from 1984 to 2014. During this period, resource rents and TFP were fluctuating together, which reflects the positive relationship in the short-run between the variables, as stated in the results. Then, precisely after 2009, TFP and resource rents started to move in opposite directions, so while TFP was decreasing, rents were increasing. This clearly explains the negative relationship between the variables in the long-run in the empirical estimates. It also means that any increase in the proportion of rents in KWT GDP, which is more dependent on natural resources, is opposed by a decline in productivity.

It can be observed that corruption and TFP are negatively correlated since, when corruption was increasing, TFP was deteriorating. This interpretation agrees with the negative relationship between corruption and TFP in the empirical findings. Figure (C4) exhibits that the condition of law and order played an important role in determining the level of TFP. In 1991, when the law and order situation was weak as a result of the Gulf War, TFP declined. Similarly, the empirical estimates indicate that improvement in law and order causes an increase in TFP in both the short and long-run.

Human capital experienced an upward trend in KWT from 1984 to 2014. Since human capital is an important determinant of TFP, as revealed by the positive relationship between the variables in the empirical results, the development in human capital enhanced TFP. The results are valid in a sense that the deterioration in TFP due to the increase in corruption or the weakness in law and order was limited and less drastic. Therefore, under these circumstances, the increase in human capital served as a shield that uplifted TFP.

## 2.2 The Kingdom of Saudi Arabia

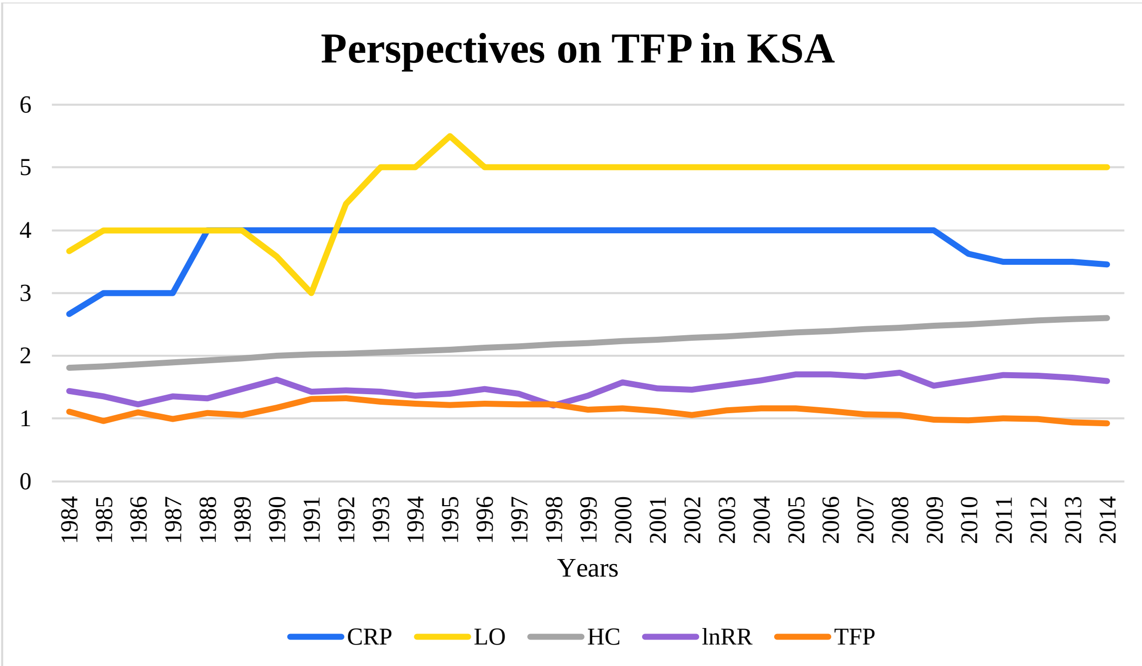



**Figure C5.** The Perspectives of TFP in KSA.
Source: calculated by the author.

In KSA, between 1984 and 1991, resource rents (% of GDP) are observed to have affected TFP but with a delayed impact, so when resource rents increased, TFP followed with a decline in the same year or after a short period of time and vice versa. This scenario was obvious in 1986, at which time the increase in resource rents was opposed by a decrease in TFP, so this scenario validates the short-run empirical findings that resource rents of a two-year lag have a negative impact on TFP. However, the overall trend shows that both variables move together, which agrees with the empirical findings of an average or a long-run positive impact of resource rents (% of GDP) on TFP.

In 1989, when law and order started decreasing, TFP was improving. When law and order started improving in 1991, TFP was declining. This supports the empirical results that show that the short-run dynamics of law and order have a negative impact on TFP. Figure (C5) shows the constant level of the corruption index with minor changes, but the overall 1984–2014 trend of corruption was upward, while that of TFP was downward. This negative relationship observed in the figure is aligned with the short-run and long-run empirical results.

The human capital index was increasing in KSA from 1984 to 2014. The long-run positive impact of human capital on TFP, as shown in the empirical results, slowed down as a result of the negative impact of human capital in the short-run, as well as the other factors that cause a decline in TFP, such as corruption, law and order, and the short-run dynamics of resource rents. Hence, as discussed in the case of KWT, human capital was the factor that prevented TFP from drastically declining in KSA.

### 2.3 The United Arab Emirates

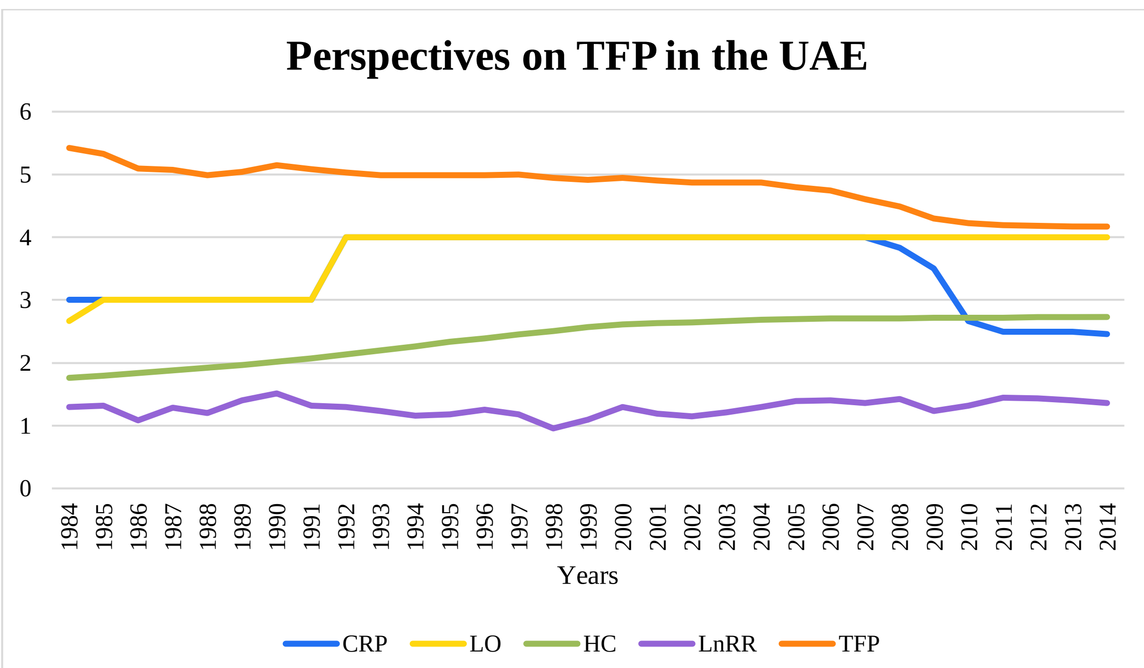



**Figure C6.** The Perspectives of TFP in UAE.
Source: calculated by the author.

In the case of the UAE, Figure (C6) exhibits that a change in resource rents (% of GDP) caused a change in TFP in the short-run. In 1990, the percentage of resource rents in GDP was at its peak, and TFP was at its highest level. Nevertheless, the figure does not reflect any long-run association between TFP and resource rents between 1984 and 2014. This validates the empirical findings of a positive impact of resource rents on TFP in the short-run, which becomes insignificant in the long-run. The relationship between law and order and TFP is not apparent in the figure or the findings, and it appears to be insignificant in both the short and long-run. Corruption and TFP moved in opposite directions between 1984 and 2008, which supports the empirical findings of the negative impacts of corruption on TFP in both the short and long-run.

The degree of the increase in corruption was not the same as the degree of decline in TFP, and the increase in corruption did not decrease TFP by much, which means that there were other important determinants of TFP that worked to speed up or slow down the TFP decline. One of these determinants is likely the human capital index, which showed an upward trend from 1984 to 2014, since the empirical findings indicate a positive impact on TFP in the short and long-run. The same scenario was repeated in the UAE. As discussed in the previous two cases, human capital is a key determinant of TFP, and the former shielded the latter from any drastic decline caused by other factors.

## 3. Further analysis of the results when Institutional Quality is the dependent variable:

This section presents three figures for each country under study. Each figure displays the data in a clear way to help in understanding the three different economies and in verifying the empirical results of the study.

### 3.1 Kuwait

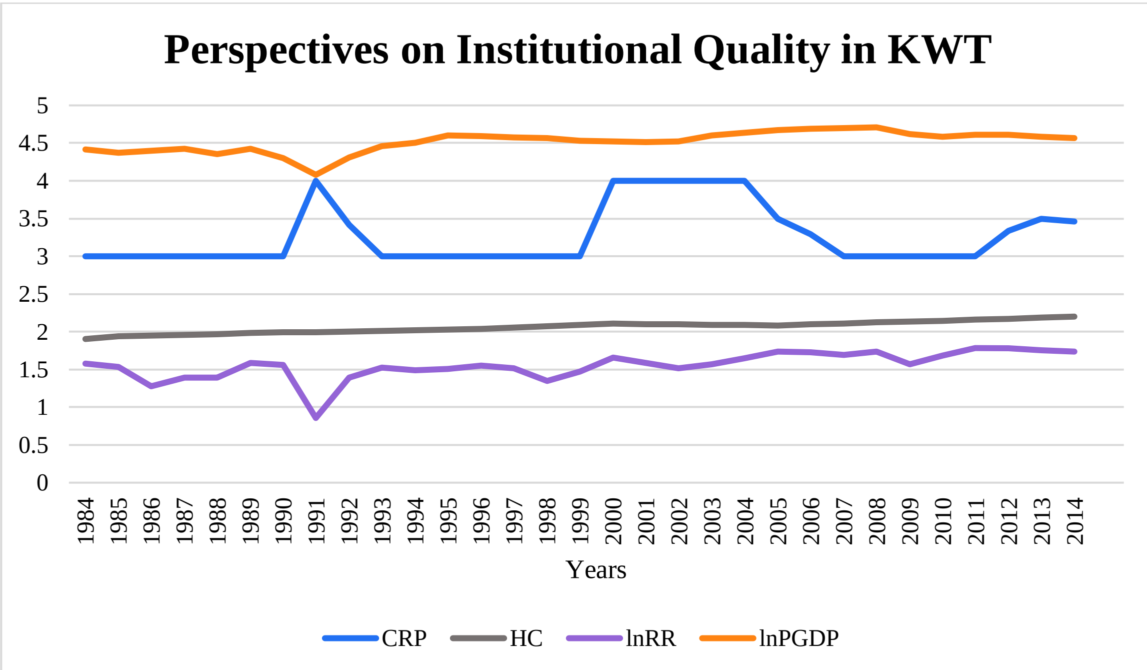



**Figure C7.** The Perspectives of Institutional Quality in KWT.
Source: calculated by the author.

The perspective on institutional quality in the case of KWT is revealed in Figure (C7). The figure exhibits the fluctuations in both the corruption index, as well as the resource rents (% of GDP) in the period from 1984 to 2014. A noticeable increase in the proportion of resource rents in KWT GDP in 1998 lead to an increase in corruption. A similar scenario was repeated after 2009. However, during the Gulf War this relationship appeared to be inversed: when resource rents were at their lowest level, corruption was at its peak. Overall, the resource rents are showing an impact on corruption in the period under study, which proves the empirical results of a positive relationship in both the short- and long-run.

The human capital index had an upward trend during the period. Though the empirical estimations indicate a negative relationship between human capital and corruption, it is difficult to observe this from the figure. Nevertheless, the importance of human capital cannot be neglected as its upward trend managed to control the increase of corruption. Thus, if human capital was declining, the corruption level could possibly stay high for the period. It is noted that the upper threshold level of corruption was 3.5 in 2013 before it started declining, while, in the previous period, corruption reached 4 before its decline. This can be related to the long-run positive influence of human capital on corruption, which managed to keep the low level at 3.5 in 2013. Further, the fluctuations of PGDP are not related to the corruption level as observed from the figure, which explains the insignificant relationship between the two variables found in the empirical results.

### 3.2 The Kingdom of Saudi Arabia

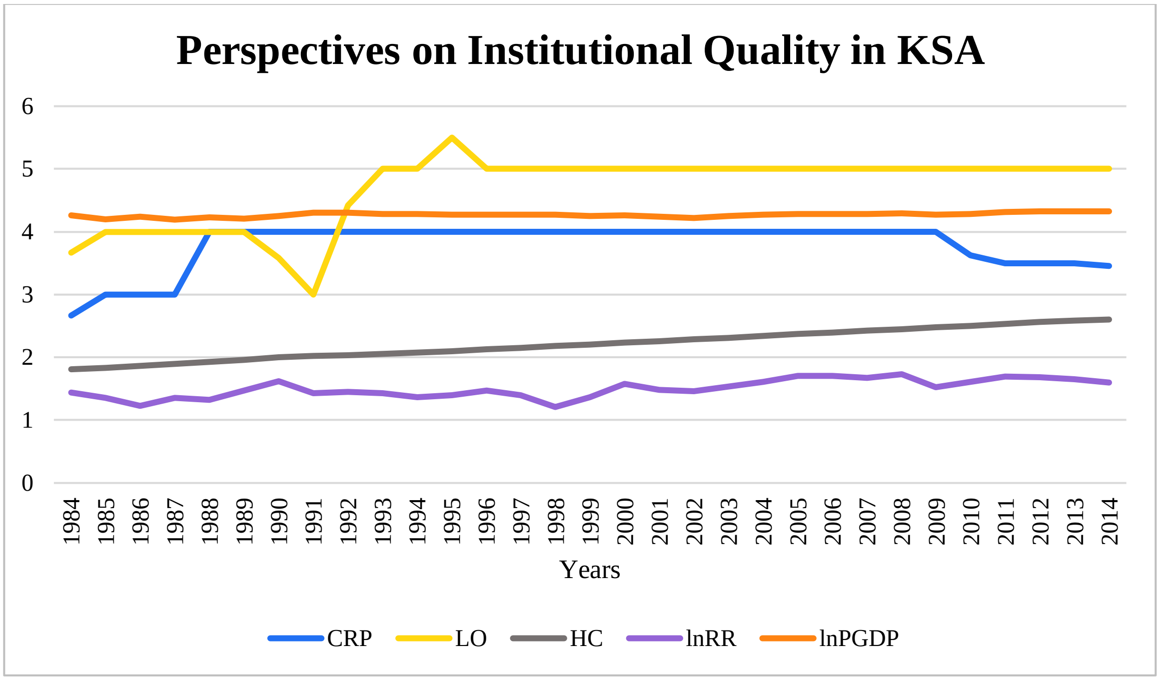



**Figure C8.** The Perspectives of Institutional Quality in KSA.
Source: calculated by the author.

The situation in KSA is presented in Figure (C8). It is observed that the corruption index started at 2.66 at the beginning of the period and then reached its highest level at 4 from 1988 until 2009, when it started declining. Then, to compare the movement of resource rents and corruption during the period, the fluctuations of rents are noticeable and reflect the volatility of this variable; hence there is no clear trend of resource rents. Accordingly, the corruption level stayed at its peak for a long period of time. This scenario verifies the short-run positive relationship between resource rents and corruption in the empirical estimates, but the relationship was insignificant in the long-run.

The deterioration in law and order in 1988 caused an increase in the level of corruption. Then, the improved situation of law and order showed a significant long-run impact in the sense that corruption started to decrease after 2009. This confirms the empirical results, which indicate that an improved law and order situation decreases the level of corruption in both the short- and long-run. The increasing trend of PGDP was at a slow pace, while corruption stayed constant at its peak from 1988 to 2009, which suggests that they are positively correlated. Thus, the increase in PGDP is reflected in an increase in corruption, which matches the empirical results of a positive relationship in the short-run.

Human capital shows an upward trend during the period, but this trend was not correlated to corruption. This verifies the insignificant empirical findings between corruption and human capital.

### 3.3 The United Arab Emirates

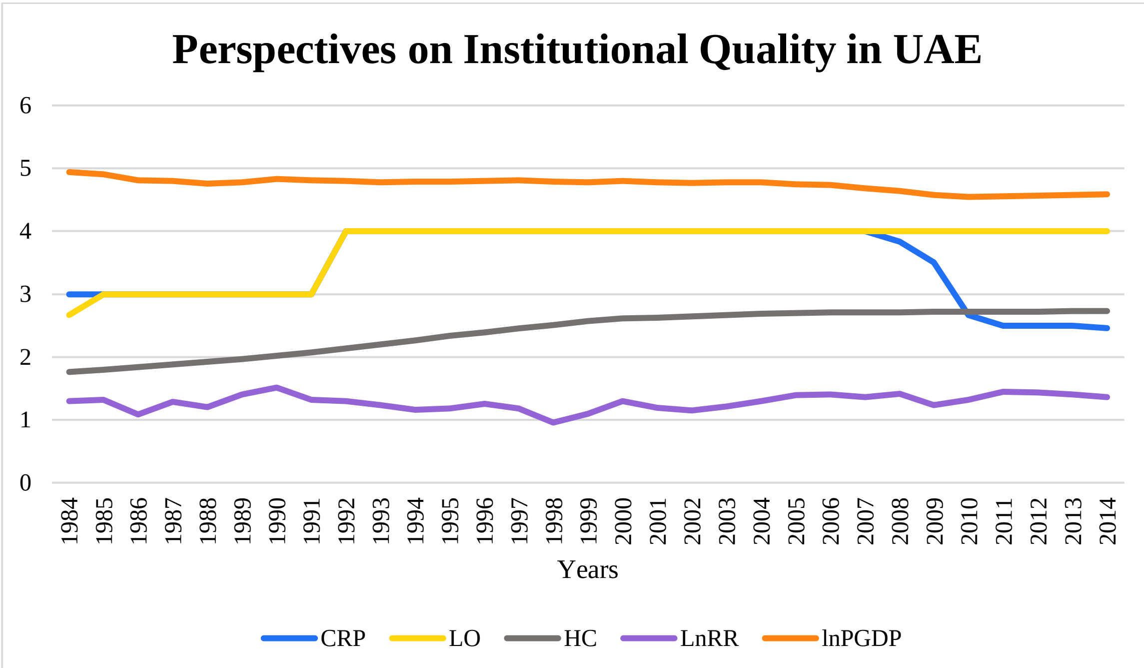



**Figure C9.** The Perspectives of Institutional Quality in UAE.
Source: calculated by the author.

The proportion of resource rents in UAE GDP fluctuated from 1984 to 2014. These short-run dynamics or volatility in resource rents managed to keep the corruption at high levels. The decline in resource rents in 2008 is reflected also as a decline in corruption. This situation confirms the positive relationship revealed in the estimated results in the short-run. In regard to the law and order situation, Figure (C9) exhibits that it matches corruption up until 2008. However, the decline in corruption did not occur because of a deterioration in the law and order situation, but because of other factors, as law and order stayed constant at a high level. The positive relationship between these two variables for a long period validates the long-run results of the study. Next, PGDP showed a slow downward trend after 2008, and was followed by a decline in corruption in the long-run, which confirms the empirical results of a long-run positive relationship between PGDP and corruption. Further, the figure shows a constant increase in human capital. Although human capital did not show an immediate impact on corruption, in the long-run, the improvement in human capital started to show some advantages in decreasing the corruption level after 2007. Therefore, this verifies the idea that human capital discourages corruption as found in the estimated results.

## 4. Further analysis of the results when Human Capital is the dependent variable:

As the results varied in this study, the following section contains three figures for each country under study, displaying the specific variables under study.

### 4.1 Kuwait

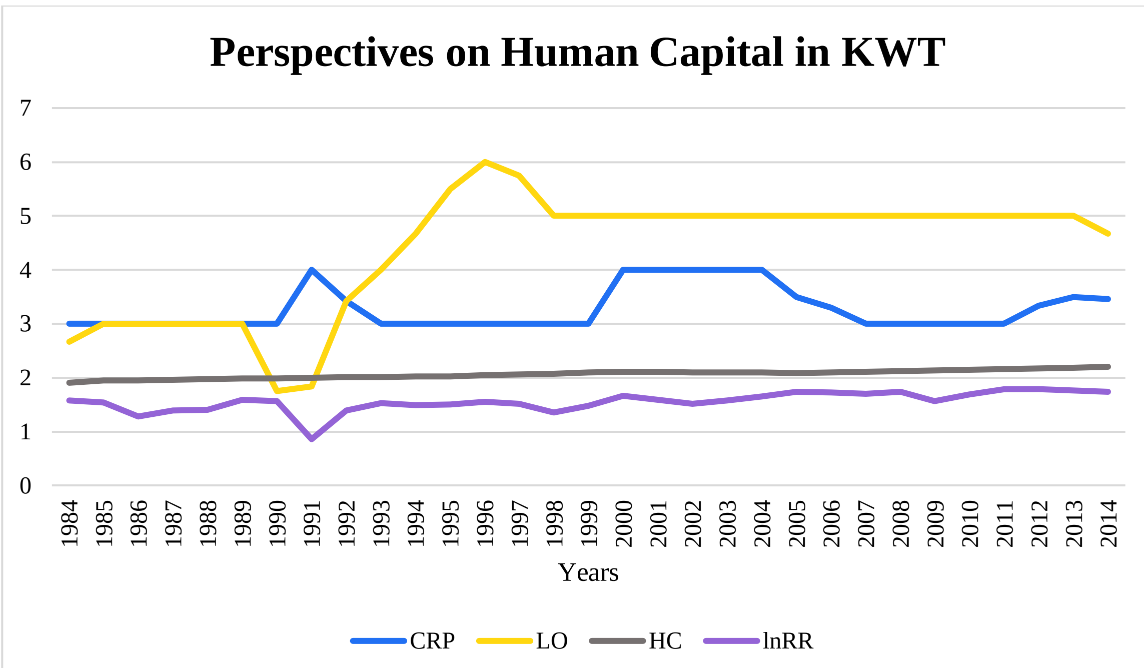



**Figure C10.** The Perspectives of Human Capital in KWT.
Source: calculated by the author.

The situation in Kuwait is presented in Figure (C10). The human capital index shows dependence on resource rents, law and order, and corruption. By looking at the trends of the resource rents (% of GDP), it can be observed that rents were declining during the periods of 1984–1986, 1997–1998, 2000–2002, and 2011–2014, while human capital was improving. However, when resource rents reached high levels, between 1993 and 1997 and again in

2000, the increasing trend of human capital was slowed down, showing a constant trend at times. These occurrences support the findings of the study.

In the case of law and order in Kuwait, the index appears to be improving with some fluctuations until 1998, when it became constant. The improvement in the human capital index from 1984–2014 showed a similar trend. Hence, a long-run positive trend can be observed, which supports the econometric results of a positive relationship between these variables in the long-run.

In regard to corruption and human capital, an important relationship can be observed from the figure. Corruption started increasing during the period of 1999–2004 and was at very high levels from 2000–2004; during this time, the progress of the human capital index was slowed, with a slight decrease. Therefore, the negative relationship between corruption and human capital in the econometric results has been verified. In 1991, there was a huge decline in the indicators of KWT due to the Gulf war.

## 4.2 The Kingdom of Saudi Arabia

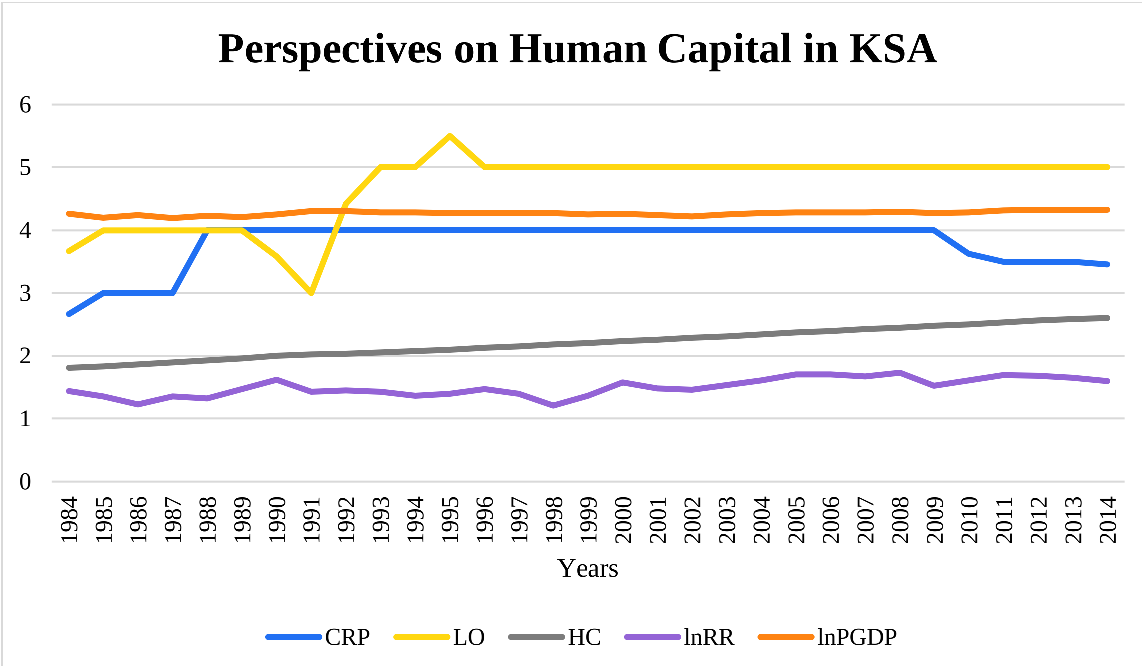



**Figure C11.** The Perspectives of Human Capital in KSA.
Source: calculated by the author.

The Figure (C11) of KSA reveals the upward trend of human capital from 1984–2014. In the beginning of the period, from 1984–1989 and, specifically, when PGDP was declining, the human capital index was increasing rapidly. The same scenario was repeated in the period of 2002–2004, which means that a short-term increase in PGDP had a negative impact on human capital index. However, by looking at average trend from 1984–2014, both PGDP and human capital were increasing. This validates the econometric results of a negative impact of PGDP on human capital index in the short-run which becomes positive in the long-run, as seen in the average impact from 1984–2014.

Further, Figure (C11) shows that fluctuations in resource rents had no impact on human capital. Despite the short-run dynamic, human capital was increasing continuously. However, in the long-run, resource rents (% of GDP) did not dramatically increase and showed a noticeable decline at the end of the period starting in 2011, which was compatible with an enhancement in the human capital index. Analysis of the figure verifies the findings of the study: We may conclude that a decrease in the proportion of resource rents in the KSA GDP increased the human capital index in the long-run, and that the results were insignificant in the short-run.

The insignificant results of law and order in both the short- and long-run are mirrored in the figure, as the fluctuations of law and order showed no relationship with human capital index. The increase in corruption in 1987 disturbed the upward trend of human capital index, which proves the negative relationship in the short-run and the insignificant relationship in the long-run, as in the econometric results.

### 4.3 The United Arab Emirates

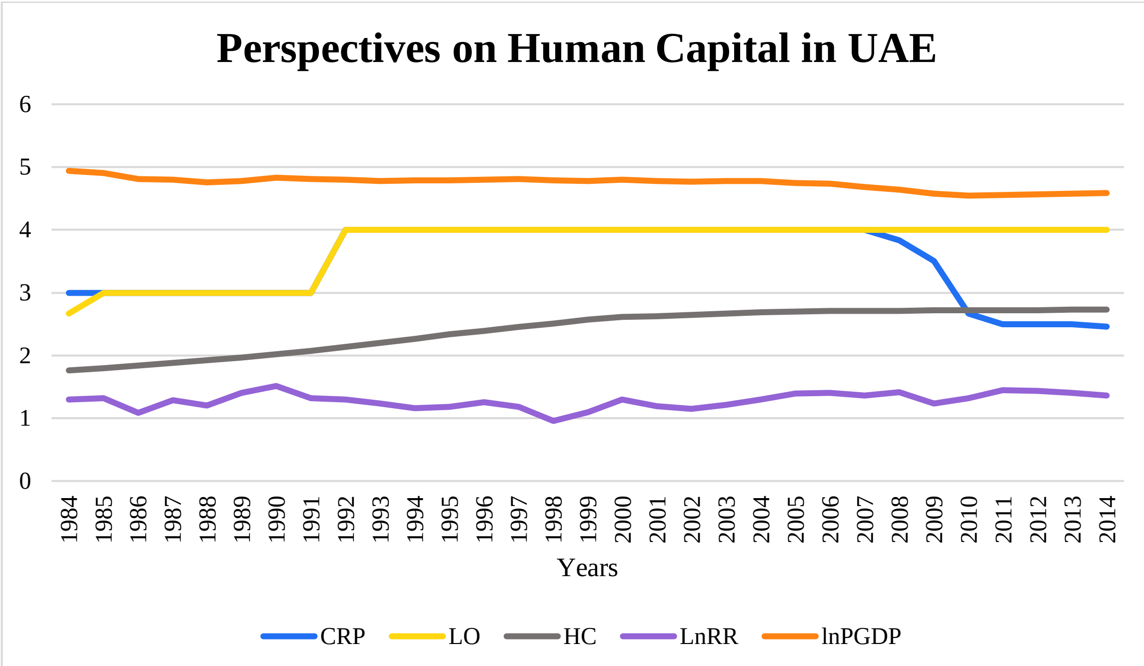



**Figure C12.** The Perspectives of Human Capital in KSA.
Source: calculated by the author.

The UAE case is displayed in Figure (C12), where the human capital index displayed noticeable enhancement over the period under study. By looking at the trends of PGDP and human capital, it can be observed that PGDP did not improve significantly and had an insignificant impact on human capital in the long-run. However, the short-run fluctuations show an impact on human capital. For example, the slight decline in PGDP during 2009–2014 was reflected in the rapid increase of the human capital trend. The trends of these variables validate the findings of the study, which show an insignificant relationship in the short- and long-run, but a positive one in the short-run with lags.

Further, fluctuations in resource rents can be seen to have affected the human capital index. When the percentage of resource rents increased in the UAE GDP, the human capital growth pace was reduced in 1990; this was observed again in 2000, when resource rents were at a high level and human capital started increasing, but at a decreasing rate. These short-run dynamics support the econometric results of negative relationships between the variables in the short-run with lags, as well as in the long-run.

As the situation of law and order was improving as well as the upward trend of human capital index from 1984–2014, the results of this study on positive relationships between the variables, in both the short- and long-run, are evidenced in the figure. On the other hand, high corruption appeared to halt human capital improvement, as other indicators were improving in a better way than human capital in UAE. This support the econometric findings of negative impacts of corruption on human capital in both terms.

# Appendix D.

## CUSUM Stability Test AND CUSUM of Squares Stability Test

### 1.1. Impact of Resource Rents on Per Capita GDP in Kuwait

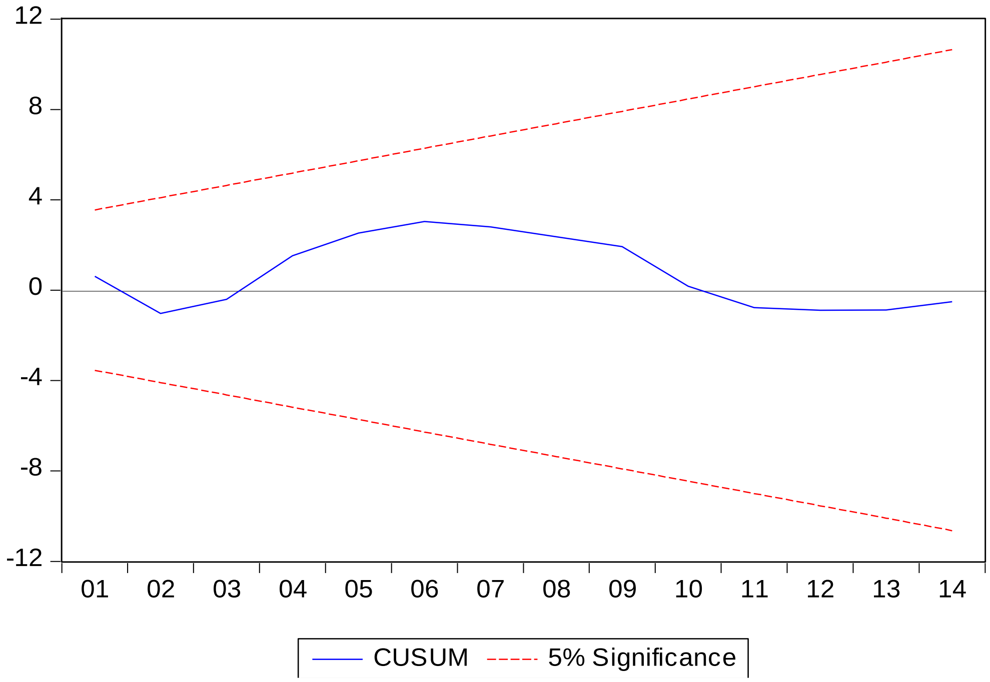



**Figure D1. CUSUM Stability Test**

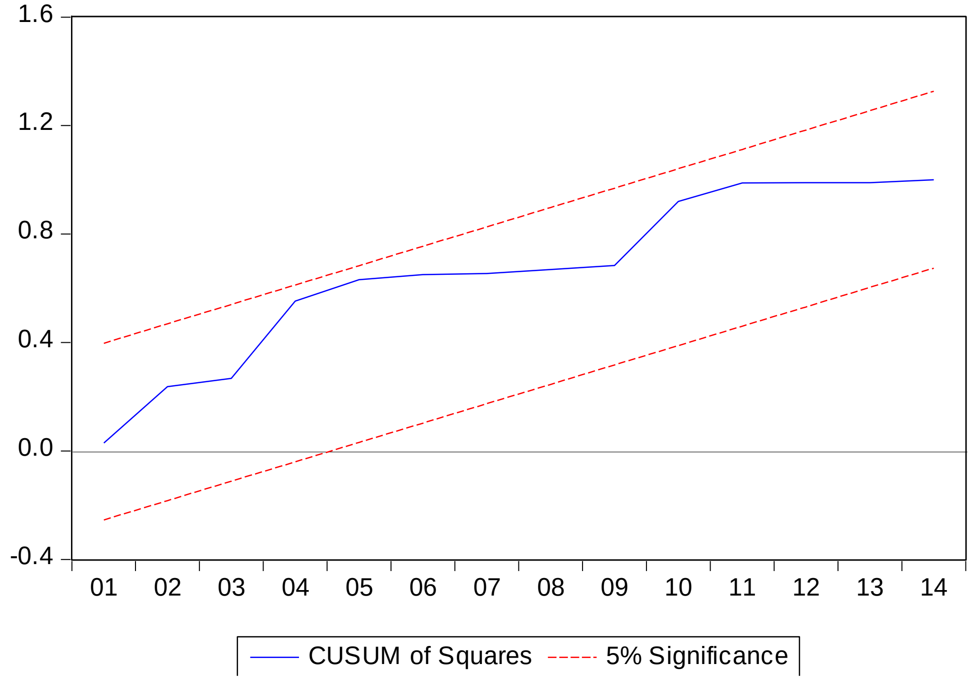



**Figure D2. CUSUM of Squares Stability Test**

## 1.2. Impact of Resource Rents on Per Capita GDP in the Kingdom of Saudi Arabia

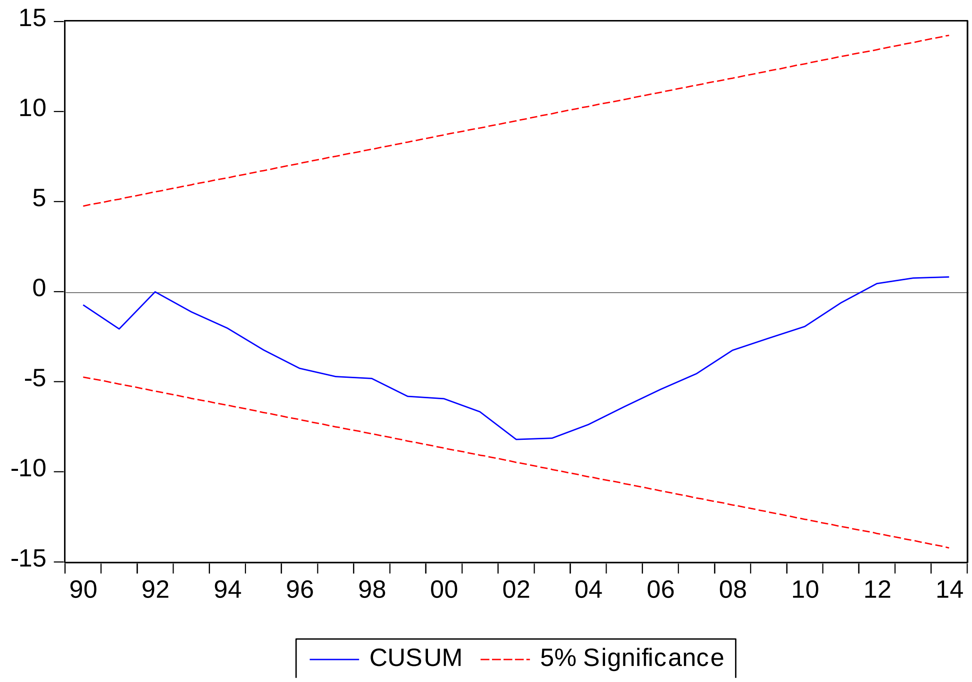



**Figure D3. CUSUM Stability Test**

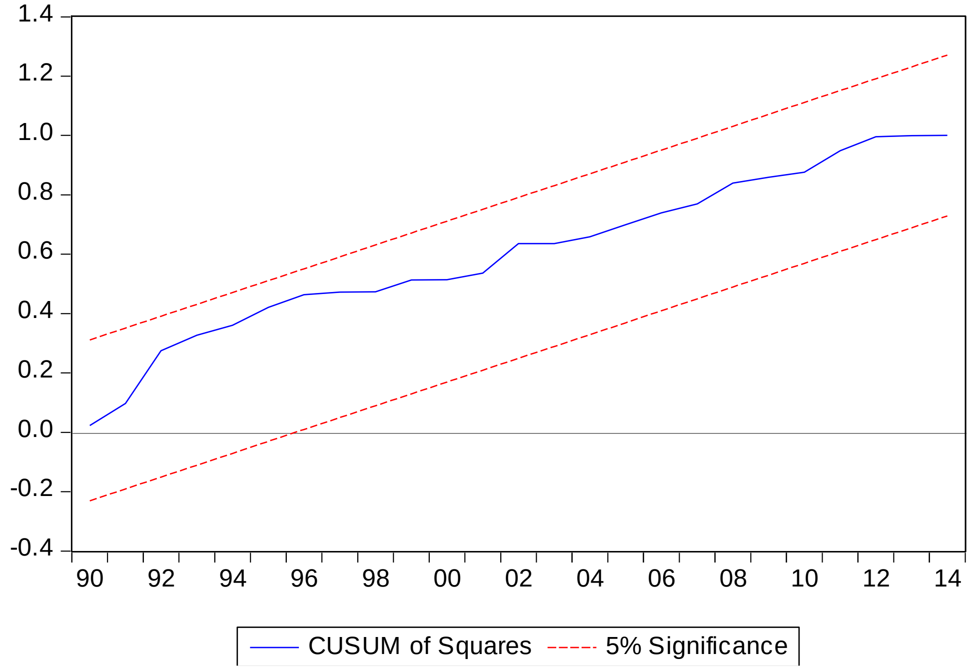



**Figure D4. CUSUM of Squares Stability Test**

## 1.3. Impact of Resource Rents on Per Capita GDP in the United Arab Emirates

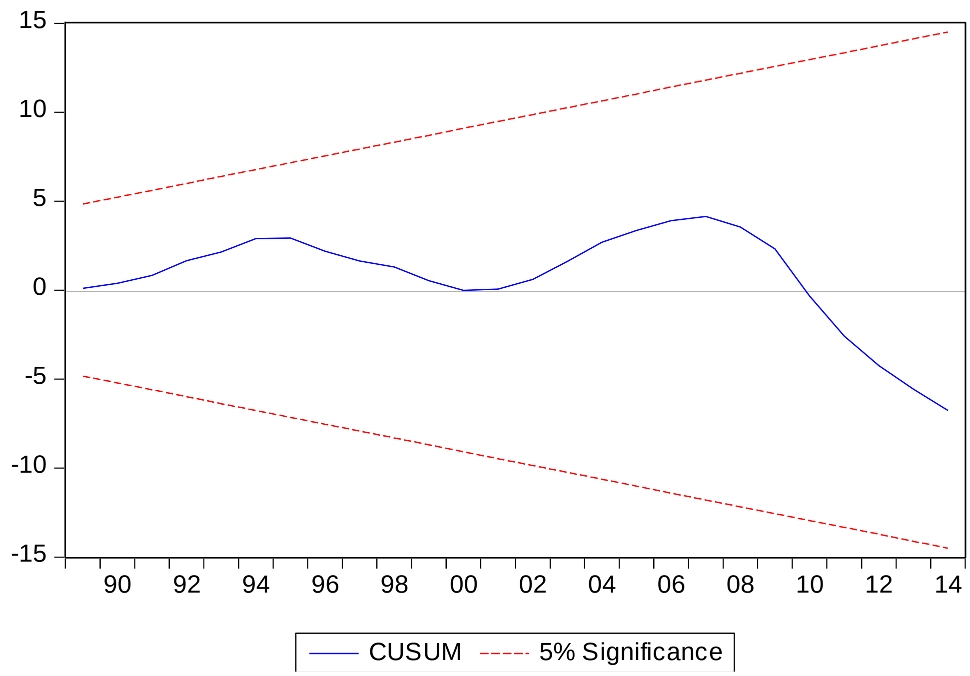



**Figure D5. CUSUM Stability Test**

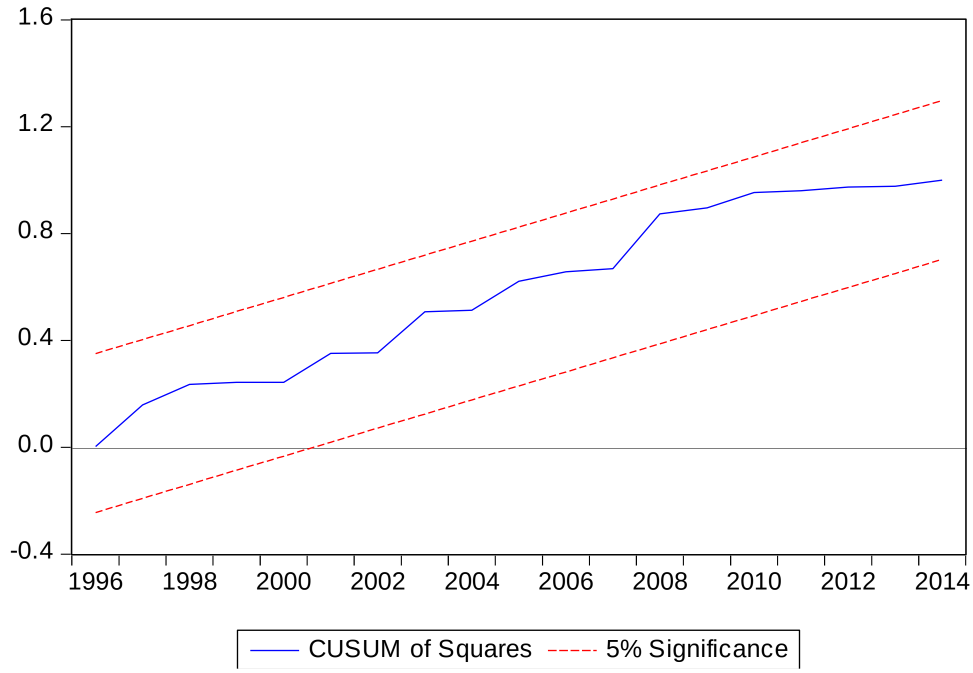



**Figure D6. CUSUM of Squares Stability Test**

## 1.4. Impact of Resource Rents on Total factor productivity in Kuwait

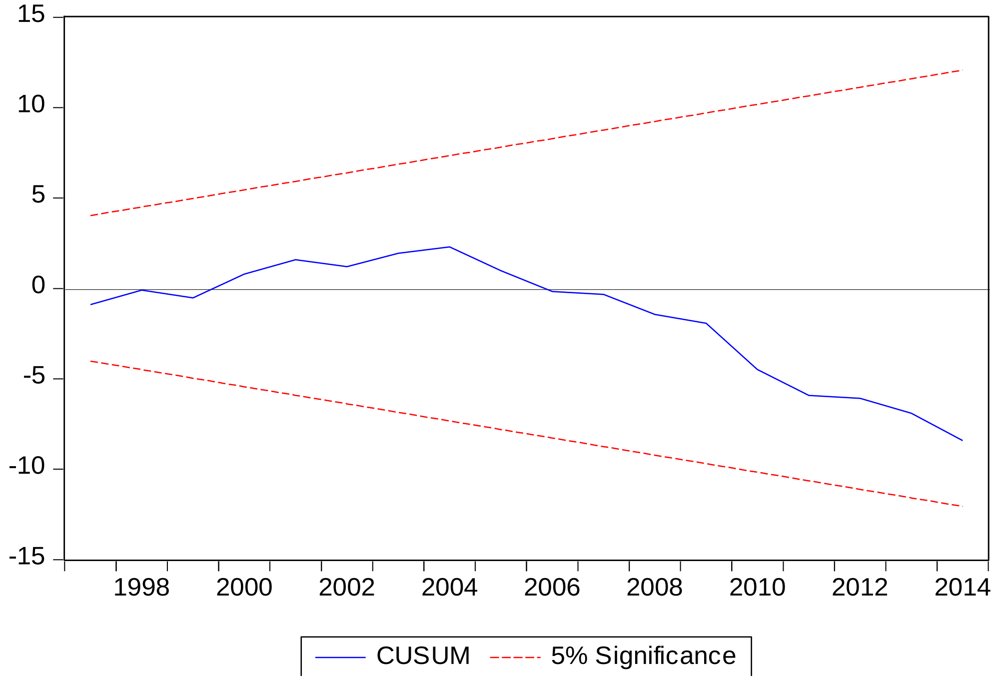



**Figure D7. CUSUM Stability Test**

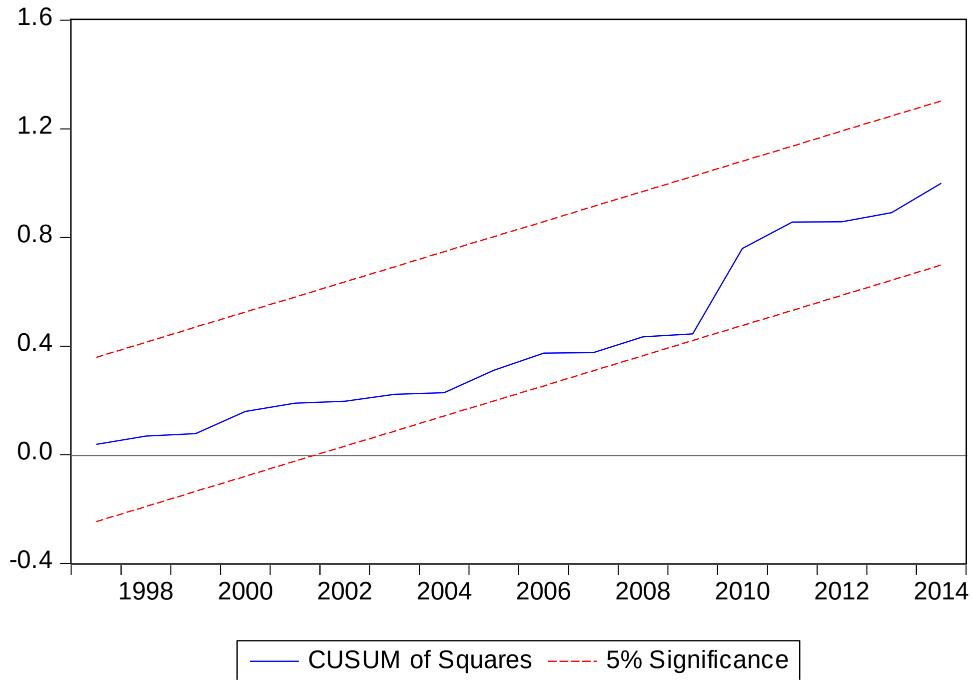


**Figure D8. CUSUM of Squares Stability Test**

## 1.5. Impact of Resource Rents on Total factor productivity in the Kingdom of Saudi Arabia

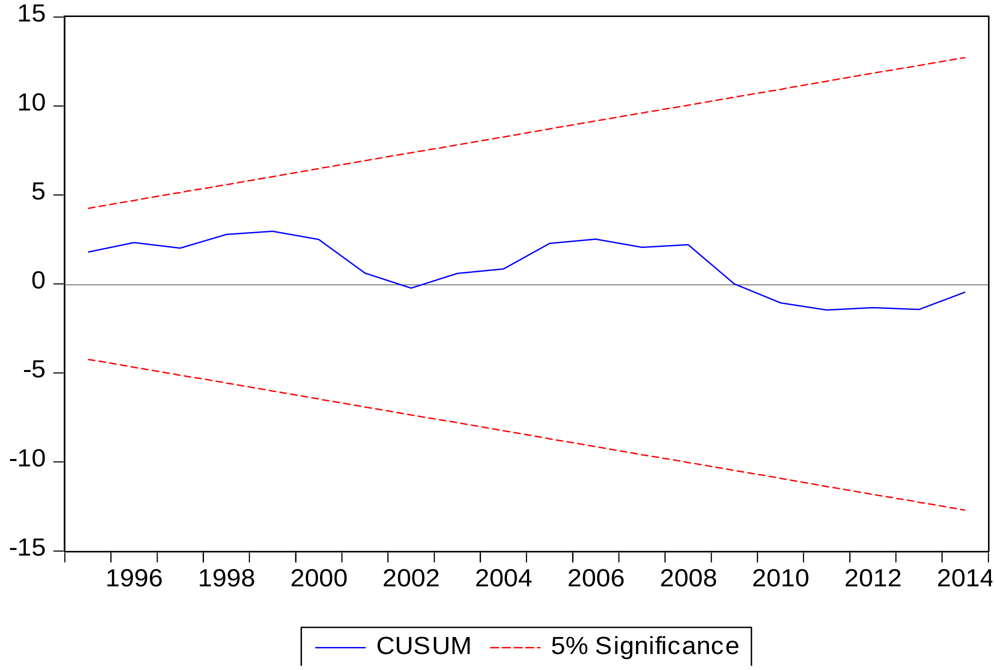


**Figure D9. CUSUM Stability Test**

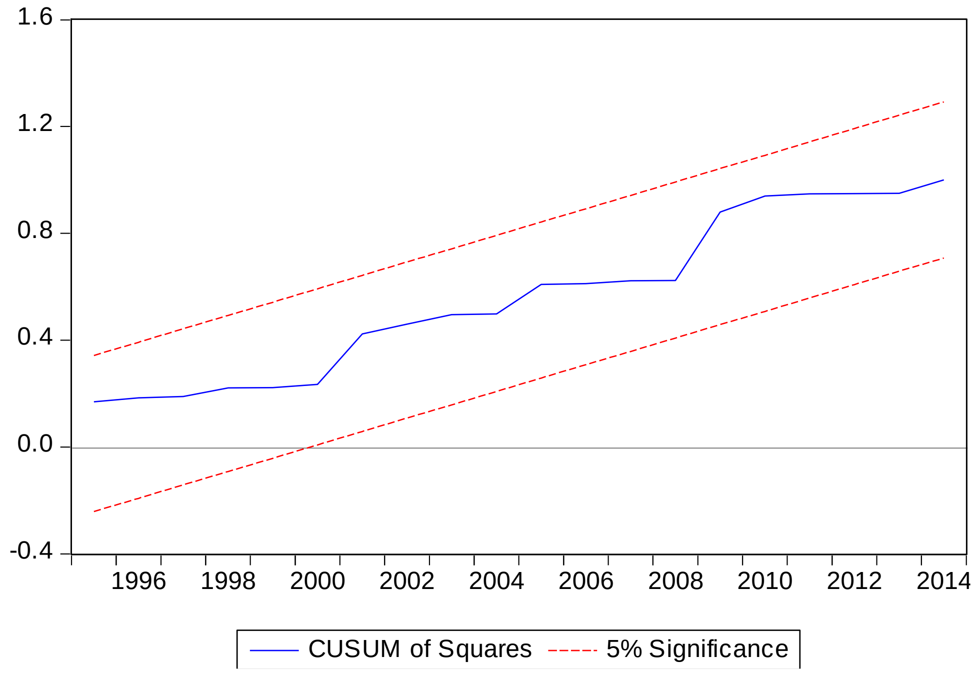



**Figure D10. CUSUM of Squares Stability Test**

## 1.6. Impact of Resource Rents on Total factor productivity in the United Arab Emirates

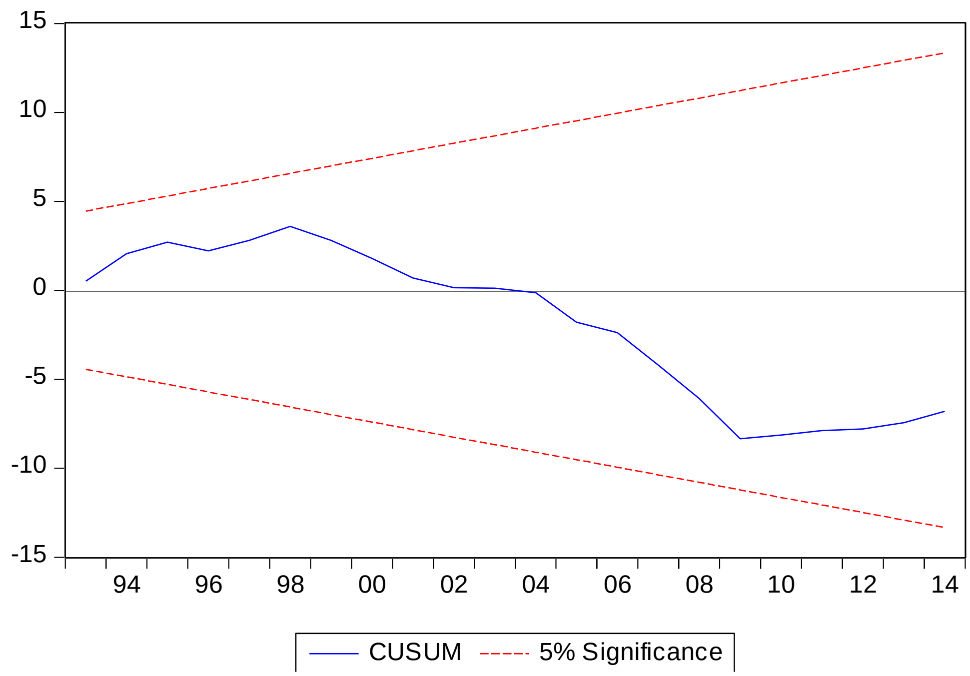



**Figure D11. CUSUM Stability Test**

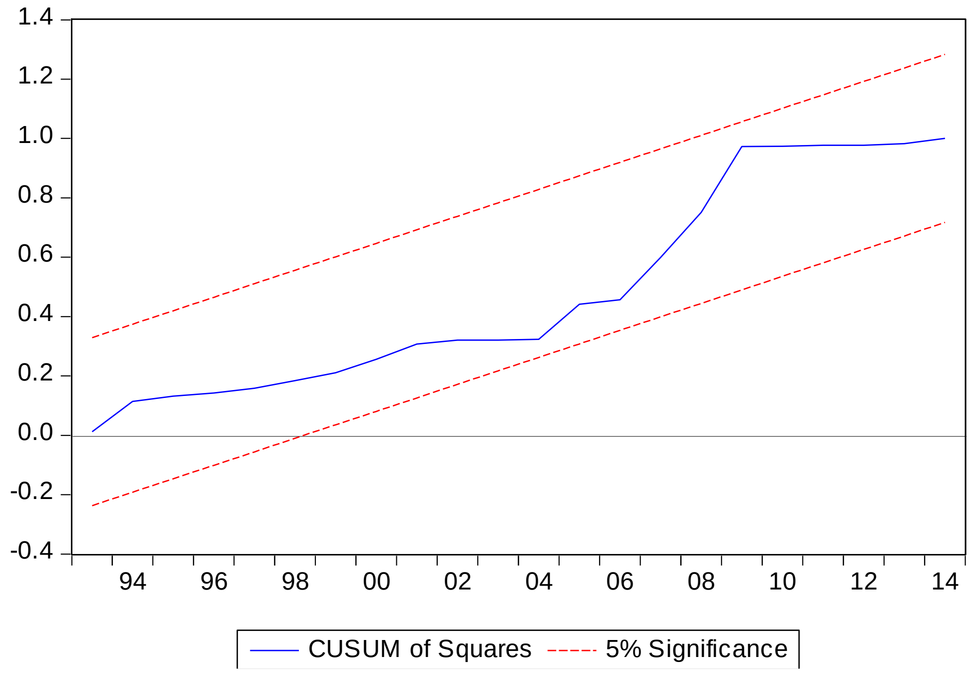



**Figure D12. CUSUM of Squares Stability Test**

## 1.7. Impact of Resource Rents on Institutional Quality in Kuwait

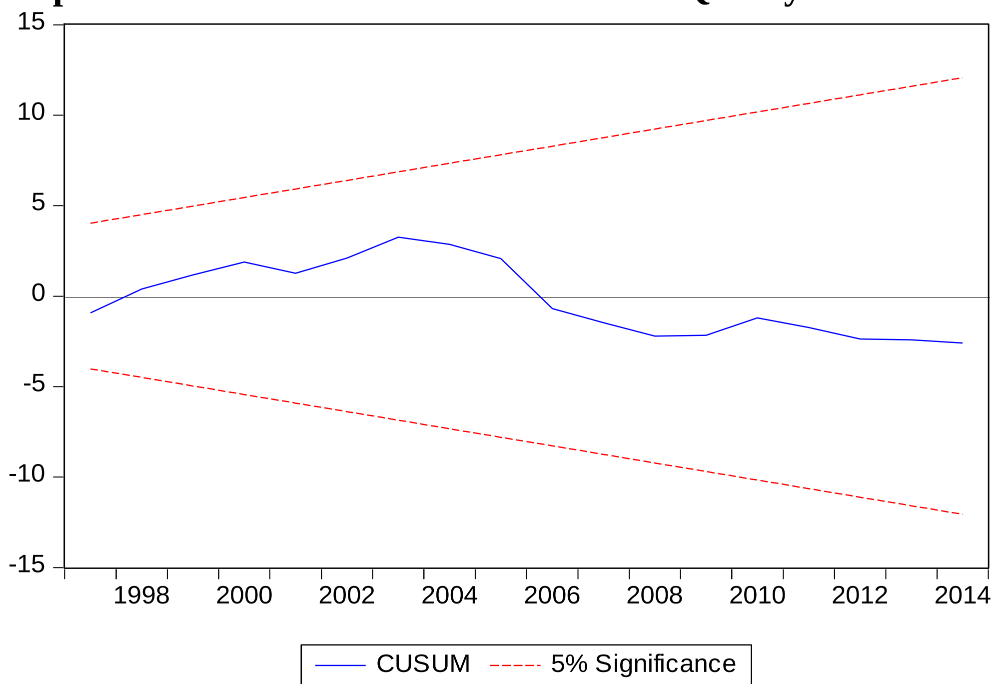



**Figure D13. CUSUM Stability Test**

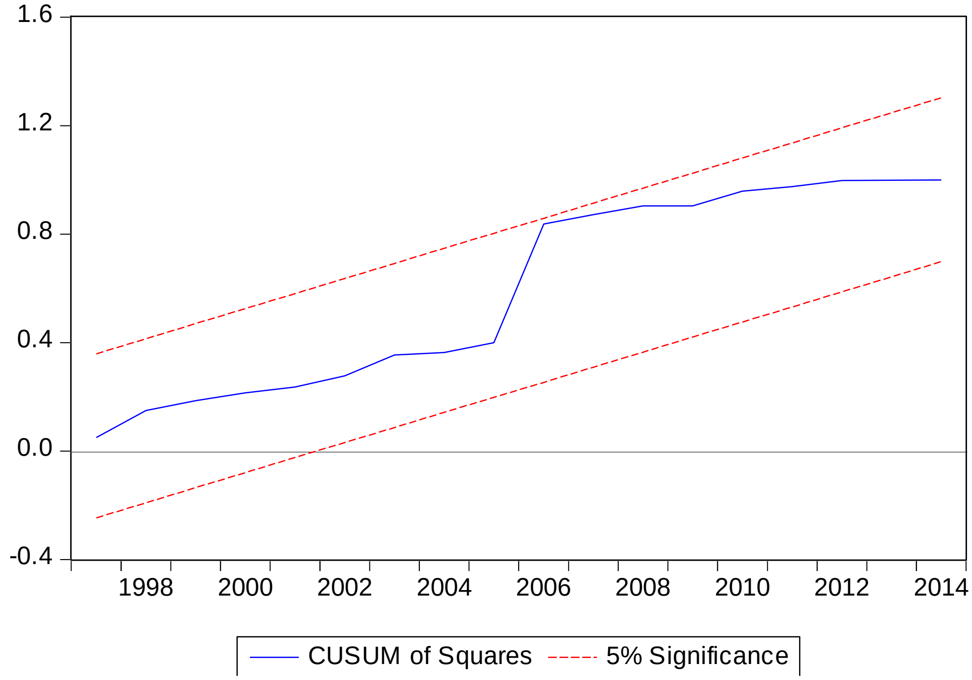



**Figure D14. CUSUM of Squares Stability Test**

## 1.8. Impact of Resource Rents on Institutional Quality in the Kingdom of Saudi Arabia

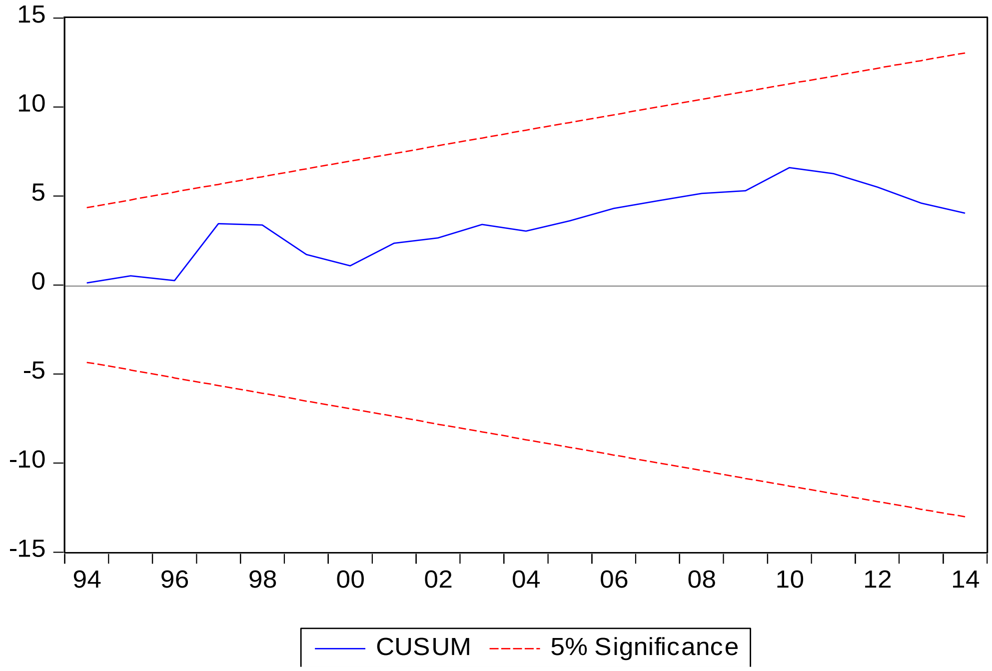



**Figure D15. CUSUM Stability Test**

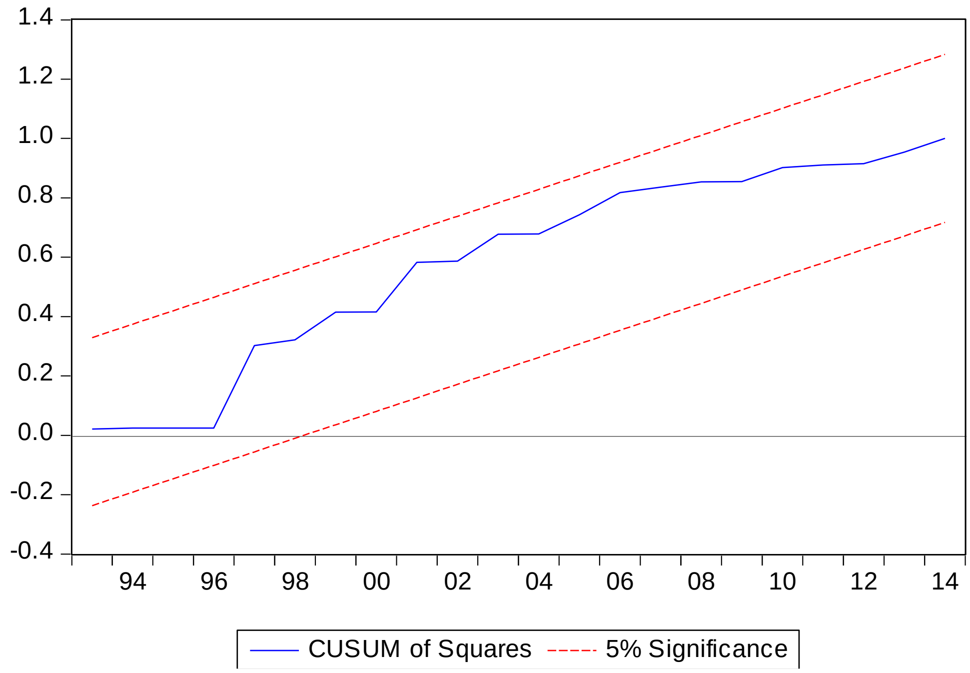


**Figure D16. CUSUM of Squares Stability Test**

## 1.9. Impact of Resource Rents on Institutional Quality in the United Arab Emirates

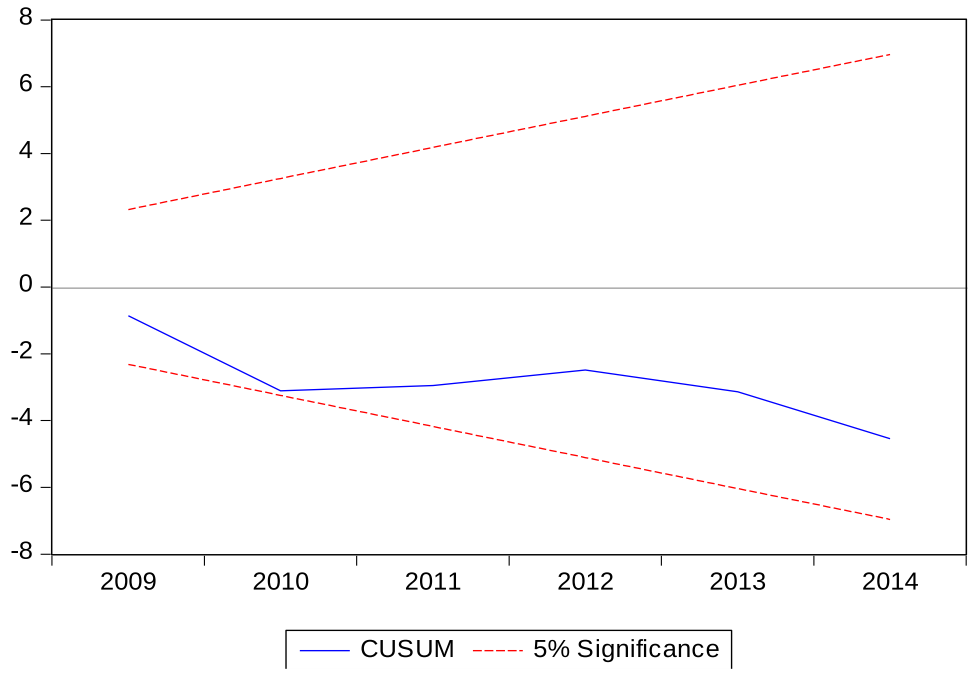


**Figure D17. CUSUM Stability Test**

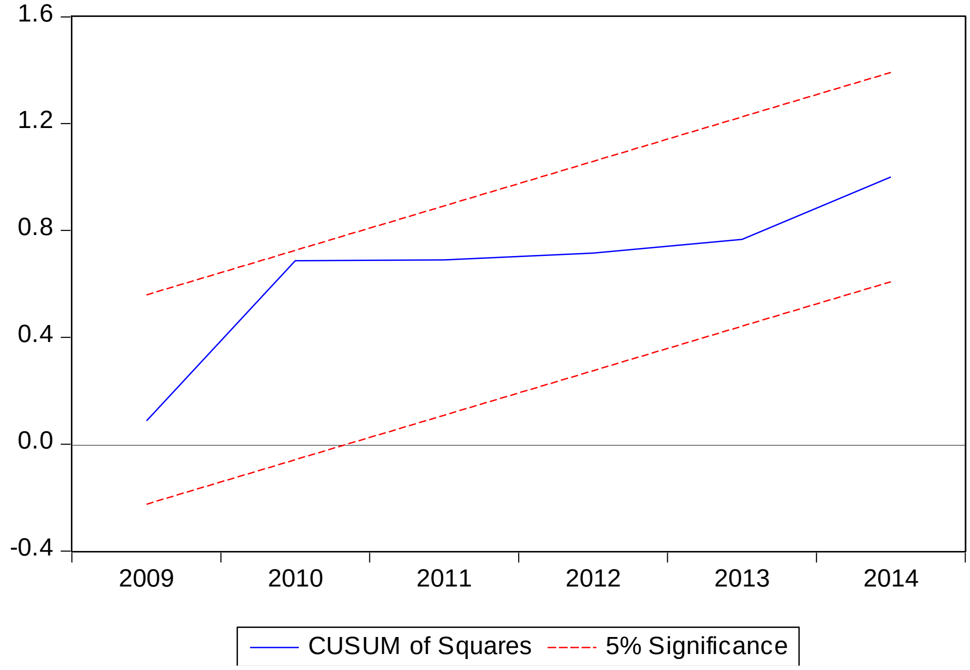



**Figure D18. CUSUM of Squares Stability Test**

## 1.10. Impact of Resource Rents on Human Capital in Kuwait

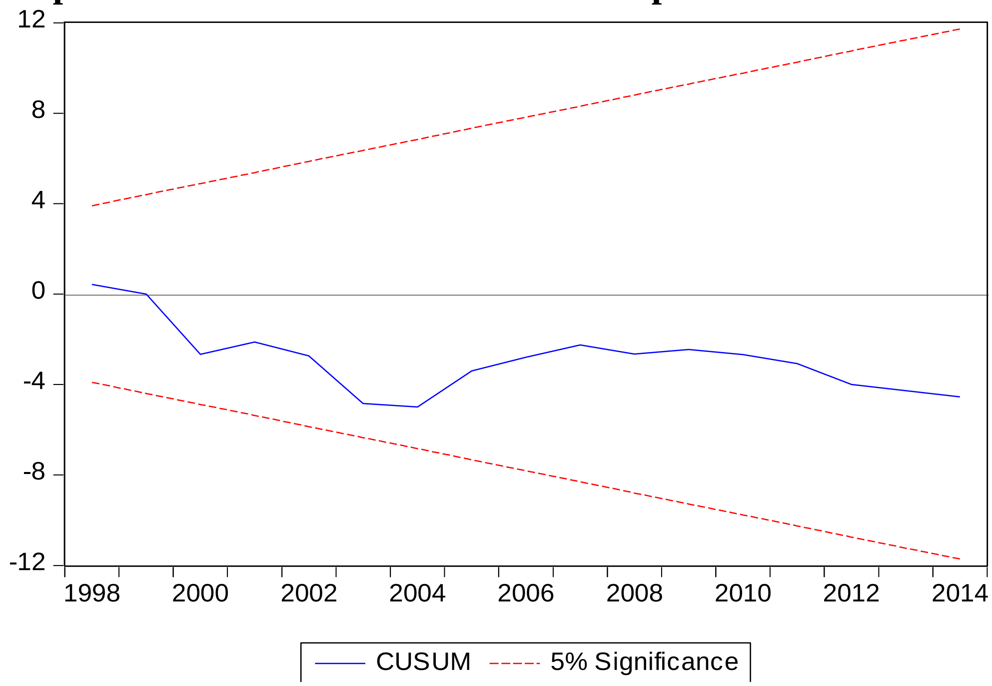



**Figure D19. CUSUM Stability Test**

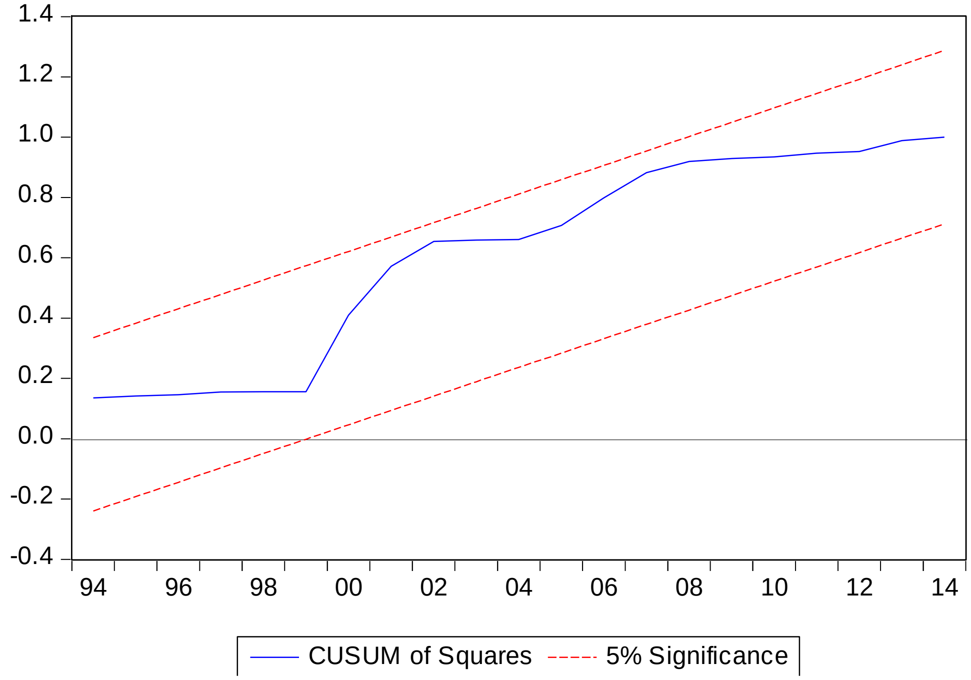



**Figure D20. CUSUM of Squares Stability Test**

## 1.11. Impact of Resource Rents on Human Capital in the Kingdom of Saudi Arabia

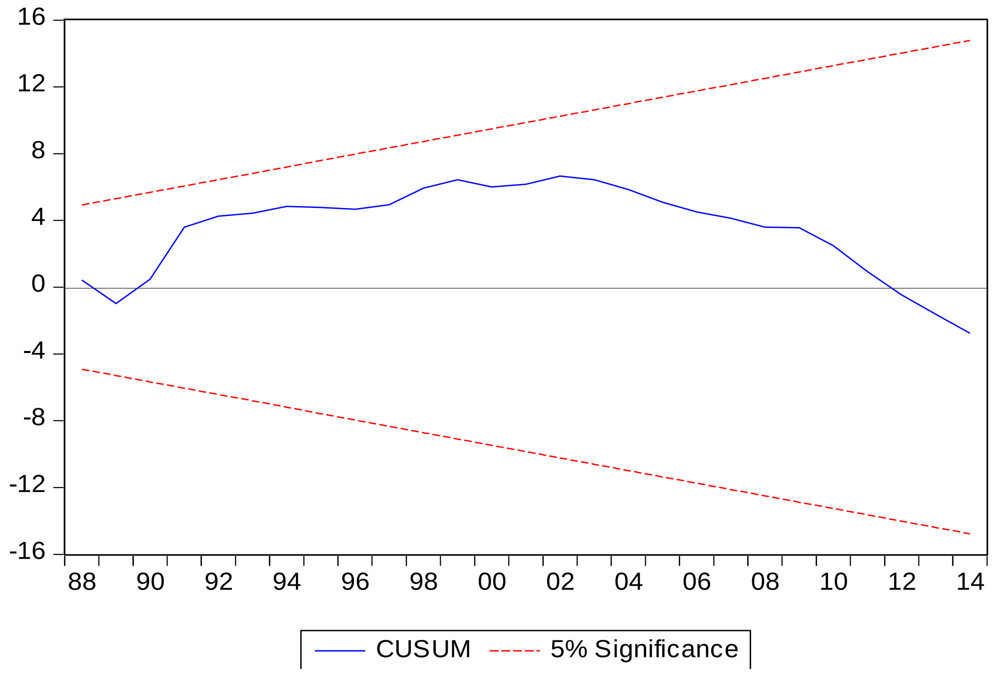



**Figure D21. CUSUM Stability Test**

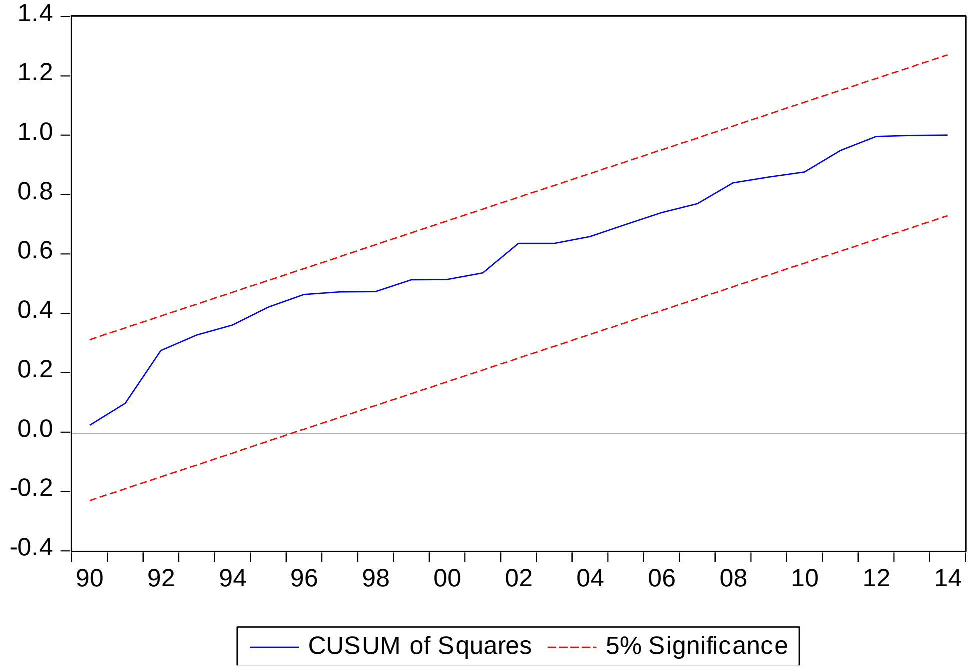



**Figure D22. CUSUM of Squares Stability Test**

## 1.12. Impact of Resource Rents on Human Capital in the United Arab Emirates

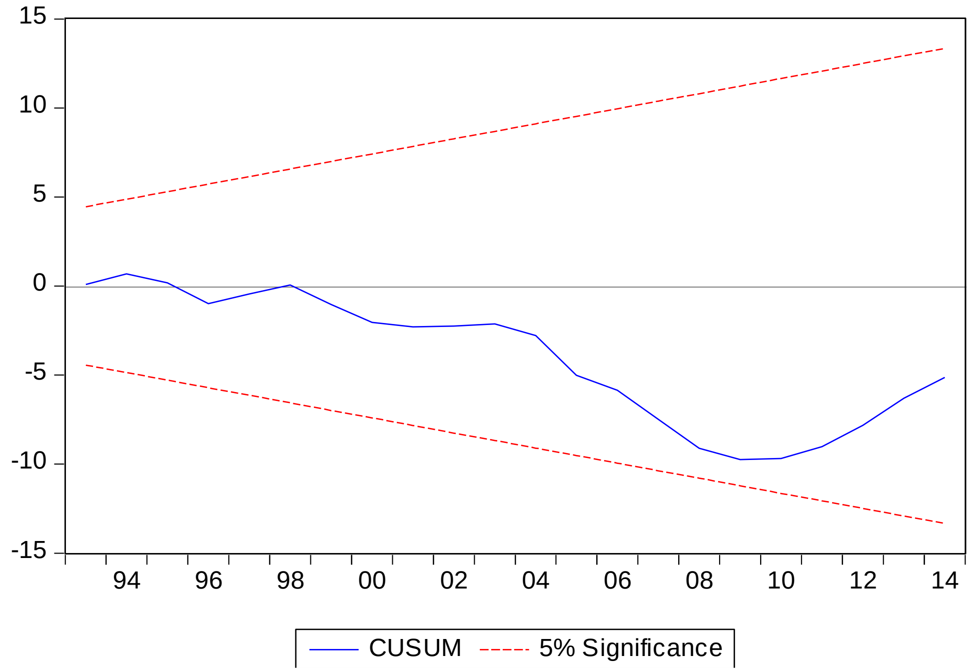



**Figure D23. CUSUM Stability Test**

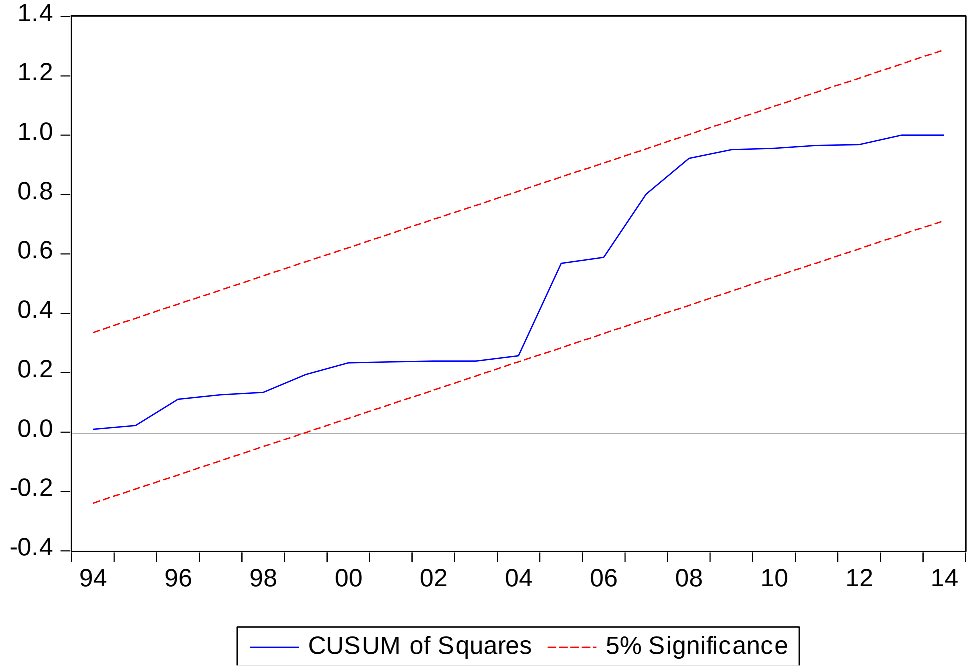



**Figure D24. CUSUM of Squares Stability Test**

# APPENDIX E.

***The First Article:*** Conference paper presented at the Harvard Medical School, Boston (21st to 25th of May 2018) and published in the *International Journal of Business and Management Studies.*

International Journal of Business and Management Studies,
CD-ROM. ISSN: 2158-1479: 07(02):203–220 (2018)

## THE ECONOMICAL, POLITICAL AND SOCIAL DIMENSION OF RESOURCE ABUNDANCE: A THEORETICAL AND EMPIRICAL SURVEY

Ruba Aljarallah and Andrew Angus
Cranfield University, United Kingdom

Resource abundance as a curse or blessing has been an overarching topic of research for both academics and policy makers. This paper aims to study the economical, political and social dimension of resource abundance. The extensive literature regarding economical dimension of resource abundance indicates the decline of decline of the manufacturing or agriculture sector. Literature exploring political dimensions overwhelmingly reports the deterioration of political institutions in the form of rent-seekingand corruption in face of resource abundance. The literature regarding social dimensions is also compatible with the findings stated for economic and political dimensions. However, a good deal of studies also reveal that the relationship between resource abundance and all three dimensions of nation life is not straight forward and depends on several factors among which institutional quality and the level of economic growth are of utmost importance. Due to favourable economical, political and social factors resource abundance can become a blessing rather than a curse.

Keywords: Resource curse, Dutch disease, Institution quality, Human capital.

### Introduction

Basic economic theory and historical examples suggest that it should be beneficial for a country to have a rich endowment of natural resources. However, the resource curse suggests otherwise. In 1993, Auty presented the "resource curse" phrase to describe the paradox that natural resource abundance appears to cause poor growth rather than richness. The resource curse can be defined as the adverse effects of a country's natural resource wealth on its economical, social, or political well-being (Ross, 2015).

A causal look at growth rates across developing countries, with stagnation in resource-rich Africa and rapid growth in resource-poor Asia, seems to be consistent with the resource curse (Ross, 1995). Indeed, several empirical studies have documented and supported the existence of the resource curse in several countries (see Auty, 1990; Gelb, 1988; Sachs and Warner, 1995, 1999 and Gylfason et al., 1999 among others).

Furthermore, countries suffering from the resource curse display higher rates and levels of corruption, resource extraction, economic concentration, government dependency, inflation, poverty, infant mortality, and undernourishment; and exhibit lower rates of transparency and accountability, per capita income, literacy, and life expectancy over time (Sovacool, 2010). Where indicated, the resource curse seems to be particularly related to point resources, which are minerals and petroleum. This is because they are high-rent resources and can easily be controlled by small

The Economical, Political and Social Dimension of Resource Abundance: A Theoretical and Empirical Survey groups and rent-seekers in society, in comparison to agricultural resources that are distributed over a larger area (Oskenbayev et al., 2013). Busse and Gröning (2013) and Bulte et al. (2005) found that high levels of point resources negatively affect governance measures, such as government effectiveness, political stability, corruption or the rule of law.

Ross (1999) found that natural resources are not naturally harmful to economic development, rather they cause distortions, which through transmission mechanisms harm economic growth. Most studies find that the resource curse is transmitted through the economy via crowding-out logic, in that the resource abundance crowds out growth enhancing activity (Welsch, 2008). Papyrakis and Gerlagh (2004) investigated the transmission channels and categorized them to corruption, schooling, investment, trade; through which natural resource affects growth negatively. Many studies have tried to analyse these transmission channels but they find a variety of results. According to Du Plessis and Du Plessis (2006) the resource curse is disturbing and alarming for all countries because of many reasons. First, these resources are non-renewable, and their rapid extraction may threaten the economic and political structure. Secondly, resource exports are relatively important in these resource rich countries, as they may be the greatest source of economic growth and development. As a result, it is necessary to explore the resource curse dynamics and to know the mechanism by which natural resources hurt growth indirectly.

However, not all studies find evidence of the resource curse. Lederman and Maloney (2008) argued that channels do not convincingly exist in many cases and that the existing cases of a curse are tentative and not robust.

In order to examine the relationship between resource abundance and economic growth, a detailed review of literature is conducted. Many channels exist regarding the causation between resource abundance and economic growth that differ in their description and level of analysis for the underlying variable or problem causing the resource curse. Empirical evidence on the resource curse seems to be highly dependent on the type of data, econometric technique and identification methods used by authors; therefore there is a wide variety of results and conclusions. The goal of this section to provide an overview of the literature addressing the economical, political and social dimensions of the resource curse. Hence, the remainder of literature review is divided into three parts. Each part contains both theoretical and empirical dimensions of the subject under consideration.

**The Resource Curse Theory**
**Studies Supporting the Resource Curse**

The work of Sachs and Warner (1995; 1997; 1999; 2001), examining the relationship between resources and growth, has become the cornerstone of research in this area. Their work found evidence of a negative correlation between the abundance of natural resources and economic growth (Sachs and Warner, 1997) and in their following papers they support the view of slow growing resource rich countries.

Focusing on Latin America, Sachs and Warner (1999) found empirical evidence suggesting that natural resource booms have done little to support long run growth, and may in fact have hindered growth on average. Resource booms are often accompanied by declining GDP per capita. The authors also characterize how Latin America and East Asia took different development paths: while Latin American economies kept its historical tradition of exporting commodities or commodity-based manufactured goods, East Asian countries favoured labour-intensive exports, and then capital-intensive and technology intensive exports. As a result, East Asia had higher growth rates. For example, Auty (2001) concluded that per capita income grows slower in resource rich countries. Moreover, Arezki and van der Ploeg (2010) found that the direct and indirect effects of natural resource dependence on growth are negative. A strong evidence of a resource curse on growth was reported by Collier and Goderis (2007), who find positive effects in the short run but negative effects in the long run.

Rodriguez and Sachs (1999) calibrated a dynamic general equilibrium model to explore why resource-abundant economies tend to have lower growth rates. They found that such economies are likely to live beyond their means. Since overshooting the steady state’s equilibrium investment and consumption can be optimal in a Ramsey growth model including natural resources, the economy will converge to its steady state from above, displaying negative growth rates on the transition.

Sachs and Warner (2001) summarized of the empirical evidence on the resource curse and provided new evidence on the topic. They showed that except for the direct contribution of the natural resource sector itself, natural resource abundant countries systematically failed to achieve strong export-led growth or other kinds of growth. Of the 20 countries considered by Sachs and Warner (2001) all countries with abundant natural resources in 1970 failed to grow rapidly over the next. Other studies such as Sala-i-Martin (1997) and Sala-i-Martin et al. (2004) recognized that natural resources have significantly negative effect on growth in the empirical studies. Satti et al. (2014) explored the resource curse hypothesis using long run data for the Venezuelan economy. They found statistical cointegration between economic growth and natural resource abundance, and a granger causality test suggests that the latter impedes the former.

By means of panel data methods, Manzano and Rigobon (2001) revisited the reasons behind poor macroeconomic performance of resource-abundant economies, particularly incorporating better data and measures on the manufacturing or non-resource sector of the economy. They stressed that instead of blaming natural resources for bad performance, empirical findings suggest the importance of credit market imperfections (debt overhang) as a reason for poor economic growth in resource-rich countries.
Specifically, resource-based economies decided to take advantage of high commodity prices in the 1970's to use them as implicit collateral for taking debt, which resulted into sovereign debt problems when commodity prices declined in the 1980's.

Within a related strand of research, Hausmann and Rigobon (2001) modelled the resource curse based on two main building blocks, specialization in non-tradables and financial market frictions, arguing for the need of macroeconomic stabilization policies and interventions to make financial markets more efficient in resource-rich countries. Moreover, Leong and Mohaddes (2011) argued that what drives the curse is the volatility, rather than abundance per se. Though, they also specify that the negative volatility effects of resource rents can be offset by higher institutional quality.

Papyrakis and Gerlagh (2007) focused on the U.S. specifically using state-level data. They found that resource scarce states tend to have a comparative advantage in development compared to resource abundant states. The main mechanisms responsible for economic underperformance among resource abundant countries are also found across resource-rich regions. However they do not suggest causality from resource abundance to lower growth, given that New Mexico and Texas show that adequate regional economic policies can reverse the pattern for individual cases. Although in the long run, the analysis support that U.S. states are converging, it also shows that resource abundance decreases investment, schooling, R&D, openness, and increases corruption. Further specific evidence for the U.S. economy is provided by Douglas and Walker (2013) and James and Aadland (2011).

**Studies against the Resource Curse Theory**

Although there is a vast body of literature supporting the resource curse, it is also true that there are a few cases where resource-rich countries managed to develop in line with other countries. Torvik (2009) posited that the resource curse field is still in its infancy and identified some methodological steps to strengthen theoretical and empirical conclusions. First, statistical causality is still doubtful, since economists still do not know to what extent natural resource wealth dampens growth. Second, it is relevant to identify the difference between cross-country successes and failures, since for every Venezuela and Nigeria, there is Botswana and Norway. A third room for improvement would be to aim at policy implications, since most studies on the topic are of positive (instead of normative) nature. Lastly, it is relevant to develop applied modelling to lengthen the political economy dimension of resource curse studies, since there seems to be a clear interplay between macroeconomics, politics and natural wealth.

In related work, Smith (2015) used panel regression techniques with fixed effects to evaluate the effect of natural resource discoveries on per capita GDP. He found no evidence to support that there is a resource curse; namely, resource exploitation has a positive impact on long run per capita GDP growth in developing countries, and no impact in developed ones. Likewise, James (2015) highlighted the relevance of including data on industry composition in growth regressions. Specifically, James (2015) found that natural resource rich countries grow slowly during given periods, but relatively faster during others, and those results are explained by average sectoral growth heterogeneity. Similar results pointing the nonexistence of the resource curse hypothesis has been provided by Davis (1995), Lederman and Maloney (2008), Brunnschweiler (2008). In another contribution, Sachs (2007) argued that the resource curse is only partially true, because although macroeconomic performance has fallen short of potential in oil rich countries, many of them have been doing well during the last years. Likewise, he proposes an agenda of long-run investment strategies as a key tool for avoiding the Dutch disease. Furthermore, results reached by Gerelmaa and Kotani (2016) are consistent with Sachs and Warner for the period 1970–1990, while they are contradictory for the period 1990–2010. Hence, they concluded that the Dutch disease and the resource curse appear not to hold in recent periods.

Alexeev and Conrad (2009) provided empirical evidence suggesting that large endowments of natural resources do not hinder long-term economic growth. Their analysis focused on GDP per capita instead of growth rates over a given period of time. Natural resource endowments increased GDP per capita and income inequality. Oil-rich countries have on average high GDP per capita and poor institutions relative to advanced economies, causing a negative coefficient to the oil wealth variable (in regression models). Alexeev and Conrad (2011) extended their analysis to study the interaction between the resource curse and economic transition.

James (2015) found little evidence that resources impede growth in non-resource sectors. This evidence is supported by other studies that find that wealth in natural resources have positive effects on growth (Brunnschweiler and Bulte, 2008). Davis (1995) asserted that the curse is the exception rather than the rule as the resource rich countries appear to perform well owing to their resources.

The review of literature above shows that the mere existence of resources does not lead to economic stagnation; rather, these resources produce certain distortions in the economy; which then act as transmission channels; which, in turn, impact economic growth. Thus, natural resources only exert an indirect impact through the transmission channels, which can range from government mismanagement, corruption and low levels of human capital. For instance, Frankel (2012) conducted a survey of the literature and said that there are at least six channels through which the natural resource abundance has a negative impact on economic performance. Those channels are: commodity price volatility, permanent crowding out of manufacturing, autocratic and/or oligarchic institutions, anarchic institutions, and cyclical Dutch Disease. The author suggests, however, that the key policy question for resource-rich countries would be how to make the best out of natural resource wealth.

**Economic Dimension of the Resource Curse**

**Dutch Disease: A Special Case of Resource Curse**

The first clarification of why some resource rich countries are showing poor development status focuses on the economic explanation of the resource curse, termed as ‘Dutch disease’ (Sachs and Warner, 1999, 2001; Torvik, 2002; Ross, 1999; Sandbu, 2006; Sala-i-Martin and Subramanian, 2013). The Dutch disease refers to the contraction of the tradable sectors in Netherlands after the discovery of gas in the North Sea in 1959 (Sandbu, 2006). As per El Anshasy (2011), the Dutch disease is the earliest and most common economic explanation for the resource curse. Another economic explanation relates to the price volatility in resource markets; which would negatively impact growth (Sala-i-Martina and Subramanian, 2013).

The Dutch Disease is a macroeconomic phenomenon that reflects changes in the structure of production and the economy in the wake of a favourable economic shock, including large natural resource discovery, rise in commodities prices, sustained aid or capital flows, or any other external factor causing a windfall gain (Corden, 1984).

The drivers of the Dutch disease and its impact on the economy were decomposed by Corden and Neary (1982) and Corden (1984) into two effects: the resource movement effect and the spending effect. The model assumes that the boom in one of the tradable sector (i.e. natural resource), raises the marginal products of the mobile factors employed within that sector, generating higher wages and profits. This process draws production factors, which were allocated, to other sectors of the economy. This is the resource movement effect. This movement of resources from other sectors to the booming sector implies a reduction in output of these sectors and particularly in the one of the other tradable sector resulting in direct de-industrialisation. The associated reduction in output results in excess demand for services (as the resource movement affects the supply of services leaving demand unchanged), one mechanism of adjustment is through the real exchange (price of non-tradable in terms of traded goods), which has to appreciate to eliminate the excess demand, switching demand away from services and dampening the fall in that sectors output.

The second impact is driven by the increase in aggregate income resulting from the boom. Assuming a positive income elasticity of demand for non-traded goods and that at least part of the extra income generated by the boom is spent inside the country, the boom initially leads to an excess demand for nontraded goods and, hence, to real appreciation of exchange rate. The rise in the relative price of non-traded goods increases the relative profitability of the non-traded goods sector and contracts the (non-booming) traded goods sectors (whose price remains fixed exogenously), this is the spending effect (Van Wijnbergen, 1984).

Considering both spending effect and the resource-movement effect, output of the non-resource traded goods sector is lower than it was initially - the Dutch Disease. Both effects contract this sector. The output of the non traded goods sector could be higher or lower than initially, the spending effect expands this sector, but the resource-movement effect contracts it. The output of the booming sector is higher since the boom occurs in this sector. If the booming sector does not participate in the domestic factor markets, the resource movement effect is negligible. This is often the assumption for an oil boom abstracting the resource-movement effect, by considering the boom as an increase in transfers received from abroad referring to the "enclave nature" of the oil industry (e.g., McKinnon, 1976; Van Wijnbergen, 1984). The appreciation of the exchange rate coupled with the increase in tradable sector prices mentioned above, renders non-boom export products less competitive in the world market and consequently leads to the corresponding movement of labour away from both non-booming tradable exports sectors and booming tradable sector to the non-tradable sector (if labour is the mobile factor), thus forcing manufacturing and booming sectors to raise their wages as well. Since they cannot compensate by raising their prices as those are determined exogenously, they will see their profits fall and must downsize. The resulting contraction of output and employment in tradable sector is referred to by Corden and Neary (1982) as indirect de-industrialization. Mironov and Petronevich (2015) confirmed the presence of several signs of Dutch disease in Russia after estimating the spending and resource movement effects as determined by the theoretical model.

Davis (1995) suggested that although the Dutch disease and the resource curse are commonly thought as being synonymous, they are two separate matters. The economic explanations of the resource curse show that there are complex and diverse cases among resource rich countries. However, these countries show that the Dutch disease doesn't seem to explain much of the negative impacts of resources on growth. Butkiewicz and Yanikkaya (2010) rejected the idea of the "Dutch disease" but support the view that the resources curse exists in developing countries with weak institutions.

**Political Dimensions of the Resource Curse**

**Studies in favour of the Political Dimensions**

There is now significant evidence that under certain conditions one type of resource wealth; petroleum; tends to yield to a "political resource curse" (Ross, 2015; Oskenbayev et al., 2013; Williams, 2011).

There has been an upsurge of interest in the political economy explanations of the resource curse; tracing the negative link between resource abundance and economic growth to rent-seeking, corruption, institutions and policies set by political leaders in resource rich countries (Torvik, 2002; Isham et al., 2005; Mehlum et al., 2006a, 2006b; Hodler, 2006, Bhattacharyya and Hodler (2010), Bjorvatn et al. (2012), and El Anshasy and Katsaiti (2013), among many others.

Murshed (2007) believes that between the three transmission channels of the resource curse; economic, social and political; the most important channel is the political economy mechanisms.

Several studies have clarified how resource abundance negatively affects institutional quality in that it happens through rent-seeking behavior, such as; lack of honesty, disregard of law and corruption (Ross 1999; Sala-i-Martin and Subramanian, 2013). Resource rich countries are more prone to corruption, inadequate governance and rent-seeking (Welsch, 2008). Bulte et al. (2005) found that resources might lead to political failures in addition to the economic and social failures. Hodler (2006) showed that natural resources have an indirect effect on income because it causes fighting activities between rivalling groups; which weakens property rights and reduces productive activities.

According to Ross (1999), political explanations for the resource course have followed cognitive, societal and state-centred approaches. Cognitive theories suggest that resource rents (windfalls) generate myopic disorders among policy makers; societal theories suggest that rents empower social groups that support growth-impeding macroeconomic policies; and state-centered theories argue that rents weaken public institutions that are required to promote long run economic growth.

Empirical studies of the political economy of the resource curse are recent. One of the few notable studies is Robinson et al. (2006), who developed a quantitative model to show that politicians are prone to over-extract resources relative to the efficient extraction path because the future discount rate is too high, and related resource booms improve the efficiency of the extraction paths. Nonetheless, natural resource booms increase the misallocation of resources in the rest of the economy, because they raise the value of being in power and provide government officials with more money to influence electoral outcomes. The magnitude of the macroeconomic impact of resource booms depends critically on institutions since they determine the extent to which political incentives map into policy outcomes.

Within the resource curse context, Brollo et al. (2013) stated that higher revenues induce more corruption, because incumbents have more rooms to grab rents without disappointing voters. Additionally, if the benefit of corruption is more valuable to those with worse outside options, individuals of lower quality are attracted into politics. Precisely because opponents are now of lower quality, an incumbent can afford to grab more rents while at the same time increasing his re-election chances. Other empirical findings confirm the existence of a political resource curse includes Karl (1997), Baland and Francois (2000), Torvik (2002), Kronenberg (2004), among others). Akinwale (2012) revealed that Dutch Disease and weak institution have significant impact on the resource curse in Nigeria. Moreover, Godwin and Chuka (2014) observed that natural resource, through its adverse effects on institutional quality, crowds out human capital and hence affects economic growth negatively in Nigeria. Wiens (2013) highlighted that bad quality of institutions leads to resource curse and this low growth would cause low quality institutions to persist. Elbadawi and Soto (2012) highlighted that the curse exists but it is conditional on bad political governance. Another paper by Nili and Rastad (2007) showed that poor growth in oil countries is related to weak financial institutions, this is caused by the weakness of the private sector and the dominant role of government in total investment.

Leite and Weidmann (1999) proposed a growth model to explain how natural resource abundance creates room for rent-seeking behaviour and determines the level of corruption in a given country. The growth effects of natural resource discoveries and anti-corruption policies depend on the income (i.e. development) level of the country. Model insights are corroborated using cross-country regressions. Mavrotas et al. (2011) presented a quantitative macroeconomic model along with supporting empirical evidence to conclude that both point resource and diffuse-type natural resource dependence retard democracy development and good governance, which ultimately dampens output growth. Theoretical insights from the model points that there is a growth collapse because of resource dissipation resulting from a wasteful rent-seeking contest. Oskenbayev et al. (2013) used a fixed effects panel econometric model along with data on fourteen regions to revise the linkages between institutional quality and natural resource concentration in Kazakhstan. They comapred the impact on growth from the country's two main export items, wheat (diffuse resource) and oil (point-source resource). Their results suggested that natural resources do not promote poor macroeconomic performance, but rather their over-abundant production is associated with rent-seeking activities.

Besides the political explanations for the resource curse, there are also political effects; such effects are called the political resource curse in the literature. Particularly, although studies show that economic growth (national income increase) leads to more democratic governments, political scientists believe that when the income increases are linked to resource wealth, such democratizing effect will shrink or disappear (Ross, 2001).

In his study, Ross (2001) used pooled time series data from 113 countries between 1971 and 1997 to test the negative effect of oil rents on democracy. He found that (i) oil abundance has a negative effect on democracy, and the damage is greater in poor states than in rich ones, and an oil exports shock will do more harm in oil poor states than in oil-rich ones; (ii) the negative effect of oil on democracy is not restricted to Middle East countries, but extends to other countries like Indonesia, Malaysia, Mexico and Nigeria; (iii) non-fuel mineral wealth have a similar effect on democracy, with examples such as Angola, Chile, Peru, Cambodia and Democratic Republic of Congo; (iv) There is tentative empirical support for three causal mechanisms between oil abundance and authoritarianism: a rentier effect (politicians use low tax rates and high expenditure to soften claims for democracy), a repression effect (politicians build up their security forces to ward off democratic claims) and a modernization effect (as people fail to land into non-oil jobs, they are less likely to claim for democracy). Furthermore, Andersen and Aslaksen (2008) found that the resource curse is present in democratic presidential regimes but not in democratic parliamentary ones, and such difference matters more for economic growth than whether the country is democratic or autocratic. Additionally, resource abundance is more prone to reduce economic growth when proportional electoral systems are in place.

On the other side, Smith (2004) studied 107 developing countries from 1960 to 1999 using cross sectional time series data. Oil wealth was found to be associated with increased regime durability (even when controlling for repression) and with lower likelihoods of civil wars and anti-state demonstrations. The general conclusion from empirical results is that oil wealth increases the durability of regimes, and such regimes seem to be robust enough to overcome booms and busts in oil prices. Aytact et al. (2016) explored why some countries seem to be immune from the negative effect of natural resource abundance on democracy. They compared two types of economies: contract-intensive economies and clientelist economies. In the latter, individuals obtain their incomes in groups that compete over state rents, while in the former; people earn their income normally in the labour market. Empirical results confirmed such theoretical belief, supported by data on 150 countries from 1973 to 2000. Results also confirm that the existence of a clientelist economy can be considered a pre-requisite for the resource curse.

This following section presents more detailed studies focusing on the second transmission route: the link between resource abundance and institutional quality.

**Quality of Institutions and the Resource Curse**

Numerous studies emphasize the importance of domestic institutions for explaining the correlation between natural resource wealth and development performance (Kolstad and Wiig, 2009; Papyrakis and Gerlagh, 2004; Costantini and Monni, 2008; Bulte et al., 2005; Sala-i-Martin and Subramanian, 2013). In related research, Bjorvatn and Selvik (2008) provided a quantitative framework to study the link between resource rents, institutions and economic performance.

Economists commonly agree that good or poor outcomes from any growth policies are mainly contingent on the institutional quality within an economy (North, 1994; Barro, 1991). It should be mentioned that the analyses based on governance or institutional quality state that the differences among growth rates of resource rich countries are related to the way rents created by the resources are distributed through institutional arrangements. And Kolstad and Wiig (2009) emphasized that the curse isn't about resource abundance per se, it is about resource rents. El Anshasy (2011) found that the existence of the curse depends on the quality of its management and it holds only during windfall shocks.

Three broad sets of results have suggested the relevance of institutions to understand the resource curse. The first set of results suggest that there are natural resources whose production or extraction is concentrated in a specific geographic or economic area, and such concentration facilitates the control of rents by interest groups (Bulte et al., 2005; Isham et al., 2005; and Boschini et al., 2007). The second set of results points out that the abundance of natural resources is strongly associated with corruption, democracy deterioration and armed conflict in countries with low institutional quality (Ades and Di Tella, 1999 and Bhattacharyya and Hodler, 2010). Such argument is also backed by other studies presenting similar results such as Tsui (2011), Collier et al. (2004), Collier and Hoeffler (2005), Ross (2004), and Dietz et al. (2007).

The third strands of results have found that the negative relationship between natural resource abundance and macroeconomic performance is present mainly in countries with already poor institutional quality (see Mehlum et al., 2006; Collier and Hoeffler, 2009; Mehrara et al., 2011 and Boschini et al., 2007). This strand of results is explored and extended by Boschini et al. (2013) and Bakwena (2012). Ji et al. (2014) argued that the quality of institutions is a key factor that impacts the relationship between resource abundance and economic growth.

Sarmidi et al. (2014) found empirical evidence to conclude that good institutional quality is the main element for fostering economic growth in resource rich countries and that institutions can indeed neutralize the effect of the resource curse; this view is also supported by Rodrik et al. (2004), Medeiros Costa and Dos Santos (2013) and Apergis and Payne (2014). As Leite and Weidmann (1999) specified that good institutional arrangement is necessary for the management of efficient and optimal resources. Apergis and Payne (2014) revealed that the unfavorable effect of oil on the economy performance could be reduced by better institutional quality in MENA countries. As good institutions are often associated with high economic freedom, which in turn promotes economic growth, a policy paper by Beland and Tiagi (2009) yielded very similar results. And the case in African countries shows that their institutional quality would not be able to reverse the resource curse (Eregha and Mesagan, 2016).

Sovacool (2010) observed that to benefit from resource abundance, it is important to have improved political institutions and openness of political system. As an example, Norway escaped the resource curse because of its well-established and well-run political and economic institutions that brought oil wealth under political control, such as a strong government involvement in the production of oil, a tax regime that guarantees large revenues, and the oil fund invested abroad (Larsen, 2006 and Listhaug, 2005).

Boschini et al. (2007) claimed that the type of natural resources a country owns is crucially important in shaping the country's development; such as minerals, diamonds and precious metals that are more problematic than agricultural products. Also, they assert that these potential problems can be controlled by strong quality of institutions. Other studies argues that the resource curse can be avoided if political regimes enhance institutions; by enforcing property rights and showing a predictable legal system (Bulte et al., 2005; Ross, 1999). Cabrales and Hauk (2011) believed that resource rich countries grow at a relatively slower rate than resource poor countries and that the quality of institutions is critical in determining whether natural resources are a blessing or a curse because institutions are linked to the behaviour and decisions of politicians.

Ahmadov et al. (2013) conducted a panel data econometric analysis on resource rich Caspian Basin countries. They found that, at the country level, natural resource revenues have a negative impact on government effectiveness, i.e. countries with higher oil and resource rents as share of GDP, tend to have lower rates of government effectiveness. Very similar results were found previously by De Rosa and Lootty (2012), that resource dependence dampens government effectiveness and the levels of competitions across the domestic economy, and such relationship seems to hold in the long run.

Rodrik et al. (2004) claimed that low quality institutions through which natural resources are channelled to an economic activity could worsen information asymmetries and adversely affect resource allocation efficiency if used by a corrupt politician. Consequently, the decision made by a government might be politically rational but economically inefficient. While high-quality institutions could facilitate mutual cooperation between market actors that reduce transaction costs and increase efficiency, by helping in efficiently channelling information about market conditions and participants. Then, institutions could act as a tool that reverses the negative relationship between poor outcomes and natural resource endowments. Moreover, Olayugbo and Adediran (2016) tested the link between oil revenue, institutional quality and economic growth using an autoregressive distributed lag (ARDL) approach. They used annual data on Nigeria and found that both low institutional quality and oil revenues promote economic growth in the short run but retards it in the long run, which confirms the resource curse hypothesis.

Brückner (2010) described the resource curse as a function of corruption and weak checks and balances. Busse and Gröning (2013) believed that natural resources can have an impact on politics through many channels. They focus on selected governance indicators; such as: government effectiveness, political stability, corruption and the rule of law. They conclude that natural resources enhance corruption opportunities and have negative impacts on the different governance indicators. Whereas Papyrakis and Gerlagh (2004) argued that the rule is that resources have positive direct effects on growth, but when the country suffers from corruption and absence of rule of law and property rights, natural wealth will turn into a curse. Bulte et al. (2005) observed that the direct link between resources and several indicators of human welfare is weak. However, they find an indirect link that operates through institutional quality. This implies that small groups in society can control resources and stop any economic development against their advantage, and that weak institutions can cause deterioration in development indicators. They also show that point resources have a negative effect on governance measures: both the rule of law and government effectiveness. Most importantly, they assert that the resource curse is a phenomenon that arises at a wider scale not just economic growth; hence countries that depend on point resources tend to perform worse across many conditions.

Unlike other economic papers, Sala-i-Martin and Subramanian (2013) stated that natural resources such as oil and minerals may or may not be a curse themselves. Instead, their work showed that natural resource abundance has a seriously negative impact on the quality of domestic institutions and through this channel on long-run growth. Although it is non-linear, that relation holds for cross sections of countries. In a specific case of Nigeria, its disastrous development path has been driven by waste and corruption (poor institutional quality) rather than Dutch disease issues. Similar results were reached by Ologunla et al. (2014) when they looked at the institutions and resources in Nigeria.

The resource curse has existed in many countries as concluded by Sandbu (2006). He uses the political economy explanations of the negative impacts of resources on growth as the interaction between the quality of institutions and natural resource rents. Rents encourage spending on economically inefficient, but politically important projects. He states that these countries usually suffer from underdevelopment, corruption and conflict, and that there is a negative impact of resource abundance on institutional quality.

Bjorvatn and Selvik (2008) presented a case study focuses on the relation between resource rents, institutions and economic performance in Iran. They study how investments and economic effectiveness are affected by the strength of interest groups and the oil revenues. They find that economic performance in Iran is negatively affected by the factionalized political system of its institutional environment, which allowed Iran to be hunted by the main actors that control the management of its resources. In Zambia, Du Plessis and Du Plessis (2006) evaluated its lack of growth and relate it to the resource curse and they study specifically whether the new institutional theory can justify Zambia's economic decline. They find that the decline was not caused by its dependence on copper; rather, this dependence worsened the impact of poor quality institutions on its growth, especially failing to protect property and contract rights. Bergh et al. (2014) related the negative link between social globalization, economic flows and improving institutions in poor countries to resource abundance, whereas this link is positive in rich countries.

Bulte et al. (2003) explored the effects of resource wealth not only on economic growth but also on economic development in a broader sense. Certain types of resources – so-called point resources that can be easily controlled by small groups in society – are typically associated with less democratic regimes and bad institutions that deliver an inadequate quality of governance. Also, countries with low levels of institutional/governance quality tend to have lower score on development indicators, but there is no evidence that the resource curse itself has an impact on development. These findings are aligned with Pike (2010), who found that oil dependence has negative consequences across a range of dimensions of government and institutional quality (including the level of democracy and corruption), and with Anthonsen et al. (2009, 2013), who found that oil and gas dependence has a negative effect on three dimensions of government quality; including measures such as corruption, bureaucracy and legal partiality.

Norman (2009) validated empirically and theoretically the belief that countries with higher stock of natural resources have subsequent lower levels of rule of law. Similar results were also found by Groning and Busse (2013). These point resources may have greater adverse economic effects relative to other resources on the quality of institutions and on economic growth (Karabegović, 2009). Moreover, Ross (1999) identified how petroleum is the only type of resource that has been consistently correlated with worse institutions and that petroleum is the key variable in most of the resource curse studies.

From another angle, Atkinson and Hamilton (2003) showed that when weak institutions allow resource profits to be spent in government consumption rather than investment then natural resource abundance would harm the development. And the growth in these countries is restricted because of state intervention and corruption (Di John, 2011). Also, evidence presented by Brollo et al. (2013) showed that government revenues from natural resources reduce the politicians' quality of education and boost corruption.

In addition, Williams (2011) showed another angle of the negative effects of oil on growth. Revenues from resource exports are negatively related to transparency, and this lack of transparency impedes economic growth. The political economy literature largely argues that the high levels of transparency and accountability; which is an effective mechanism to monitor the government actions; turns the resources into growth enhancing assets. Evidence presented by Brollo et al. (2013) showed that government revenues from natural resources reduce the politicians' quality of education and boost corruption.

All in all, the link between economic growth and institutions has well been documented by Acemoglu et al. (2003), Acemoglu and Robinson (2012), Rodrik et al. (2004), Dias and Edinaldo (2012), Hall and Ahmad (2014), among others, so if there is a negative effect on institutions caused by resource revenues, it will certainly be harmful for macroeconomic performance too.

**Studies against the Political Dimensions**

Brunnschweiler and Bulte (2008) and Brunnschweiler (2008) challenged the view that resource abundance causes deterioration in the effectiveness of national institutions and governance. Both studies found no evidence of negative indirect effects of resources through the institutional transmission channel; he concludes that resource dependence is unrelated to growth and institutional quality. However, they found that resource abundance has a positive impact on institutional quality and growth, hence contradict the resource curse phenomena.

Although many resource rich countries have weak institutions and relatively slow development, Bjorvatn et al. (2012) argued that a strong government, even with weak institutions, should be enough to use resources as one of these assets that enhances growth. Another view looks at the severity of the resource curse; Yang (2010) argues that institutional quality has no effect on the severity of the resource curse. However, he relates the major role to country's policies in minimizing the negative impacts of resources abundance.

Overall there is no consensus over the link between institutions and resource curse and many suggest the link is different for each country (Brunnschweiler and Bulte, 2008 and Bulte et al., 2005). As it is recognized from the previous paragraph, although some authors disagree with the institutional quality as a major transmission channel, the majority says that institutions matter.

As a result, the search for the Resource curse causes, validity, and how to shield the economy from it remains of interest, especially for policy makers and producers of resources in developing countries (Torres et al., 2012).

**Social Dimensions of the Resource Curse**

Despite the curse concerning, primarily, the detrimental effect of resource abundance on growth rates, there is also evidence that indicates how countries rich in resources tend to perform comparatively worse than resource poor countries in the main development and social indicators, such as life expectancy, education, child mortality or in the human development index (Ross, 2001; Bulte et al., 2005); Gylfason et al., 1999 and Gylfason, 2001).

This transmission channel of the resource curse is shown by Welsch (2008), who found that knowledge accumulation and capital formation is negatively related to natural resource wealth. He shows that natural resources reduce the public and private incentives to save and invest. Moreover, he states that public spending on education is low in resource rich countries, a result confirmed by Papyrakis and Gerlagh (2004). Behbudi et al. (2010) examined the correlation between resource abundance, human capital and economic growth and find that resource richness causes countries to assign inadequate attention and expenditure to education. Hence, a negative relationship between natural resources and human capital. Their findings support the view that human capital serves as a transmission channel of the resource curse. However, they also find that high levels of human capital were found to offset the negative effects of natural resource abundance.

Output growth and the share of natural resources have been found to be negatively correlated with at least four main channels of transmission that have been identified: the Dutch disease, rent-seeking, overconfidence and the neglect of education (Gyfalson, 2001). Papyrakis and Gerlagh (2004) posited corruption, investment, terms of trade, trade openness, and schooling as transmission channels. In both cases, human capital formation is part of the resource curse transmission mechanism. Also, Kurtz and Brooks (2011) argued that human capital endowments are a crucial mechanism to distinguish whether resource wealth can be a curse or a blessing.

Education is a necessary element for rapid economic growth and development across the globe (Barro, 1997 and Aghion et al., 1999), because it improves the quality of living conditions by increasing efficiency of workers, fostering democracy, creating good governance, enhancing equality, etc. However, according to Gyfalson (2001), countries that consider their natural resources their most relevant asset, are prone to neglect human capital development by allocating low attention and financial resources to education. In other words, natural resource abundance dampens the need for education due to the false sense of security. Gyfalson et al. (1999) found that school enrolment at all levels is inversely related to natural resource abundance: e.g. OPEC countries sent 57% of youth to secondary school compared with 64% for the world as a whole. Also, resource rich countries are likely to spend 1% less on education (as share of GDP) than the global average.

One risk that comes along with natural resource abundance is that too many workers are locked in low-skill, natural-resource-based industries, such as agriculture or mining, so they fail to advance their own education or earnings. Further, another risk is that the authorities and people from resource-rich countries become confident enough to underrate the need for sound macroeconomic management and good education (Gyfalson, 2001). Bravo-Ortega and De Gregorio (2002) found that natural resources have indeed a negative impact on economic growth in countries with low levels of human capital, despite of the existence of a positive income effect. The abundance of human capital partially mitigates the negative effect of resource abundance on growth. Extremely low levels of human capital may give rise to stagnation problems, because the economy tends to specialize in natural resource-related activities. Cockx and Francken (2014) extended the resource curse concept by investigating the link between natural resource wealth and social spending. They conclude that natural resource wealth is negatively linked to public health spending and human development. This is also confirmed by El Anshasy and Katsaiti they stated, "public health provision declines with greater hydrocarbon resource-intensity". Butkiewicz and Yanikkaya (2010) believed that resource rich countries may invest less in the development of human capital, which impedes the development of the non-resource sectors, resulting in lower overall growth rate.

To analyse the specific case of Latin America, Blanco and Grier (2012) used data on 17 countries between 1975 and 2004. Their evidence suggests that aggregate resource dependence does not have a statistically significance on the accumulation of human and physical capital. On the other hand, when natural resource dependence (as a variable of the model) is disaggregated into sub-categories, petroleum export dependence has a positive effect on physical capital and a negative on human capital, and such effects hold in the long run. When considering agricultural exports as another type of resource dependence, they generate a long-run negative effect on both physical and human capital. Carmignani (2013) concluded that resource abundance affects human development by reducing the quality of institutions and increasing the inequality of income.

Manuelli and Seshadri (2014) provided insights from a calibrated macroeconomic model suggesting that human capital is a critical variable in the determination path of the wealth of nations and that the quality of human capital is not uniform across different development levels. Further, the model predicts that a large portion of cross-country output divergence are because of differences in the quality of human capital. Shao and Yang

(2014) developed a similar quantitative strategy, an endogenous growth model to explore the linkages between human capital accumulation and economic growth in natural resource abundant economies.

Additionally, Cockx and Francken (2015) studied a large panel dataset of several countries from 1995 to 2009 and found evidence that public education is negatively affected by natural resource dependence. The effect works through indirect channels such as deterioration of government accountability and crowding-out of skilled-labour intensive sectors. In summary, public education expenditure as share of GDP seems to be lower in countries; which are highly dependent on resource intensive activities.

**Studies against the Social Dimensions**

Only a handful of studies present evidence counter to the negative relation between resources and human capital. For example, Stijns (2006) conducted a panel vector autoregressive (PVAR) analysis to study the links between natural resource abundance and human capital accumulation, and concluded that there is no negative relationship between them. Resource rents per capita are significantly correlated with improved indicators of human capital accumulation. He argues that previous empirical results pointing out a curse between both variables, might suffer of specification errors due to the selection of non-accurate indicators of natural resource abundance. Another study presents the same results by Davis (1995), who finds that 22 resource rich countries compare favourably to resource poor countries in terms of GDP per capita and different human development indicators.

Moreover, Faria et al. (2016) found no direct impact between human capital and development; yet, this impact was clear through economic institutions. Also, Torvik (2002) developed a new mechanism to explain why resources may decrease welfare and income. He combines rent-seeking and increasing returns to scale to capture the idea that more resources might lower social welfare. In his empirical analysis, Daniele (2011) showed how resource abundance is linked to lower human development but relates this negative link to the lack of effective management of resources and not to the resources themselves. He emphasized that the impacts of natural resources on economic and human development can be very diverse, and strictly related to certain institutional and national political characteristics in cases like the Democratic Republic of Congo, Equatorial Guinea, and Botswana.

Although human capital is not a guarantee for achieving long run economic growth, from a theoretical standpoint it is expected that education and skills development do have an impact on growth. In the endogenous growth literature (see Lucas, 1998; Aghion and Howitt, 1988 and Romer, 1990) human capital is just another production factor and therefore investment in human capital is similar to investment in other input for production (e.g. physical capital). Becker (1964) and Schultz (1961) also suggest that education augments skills, which in turn, augment labour productivity. Suslova and Volchkova (2012) recommend to set educational policies directed at skilled labor force, is crucial to guarantee economic development sustainability in resource rich nations.

**Conclusion**

The resource curse is a complex problem and the hypothesis has been analysed in many cross-country studies, both from empirical and theoretical approaches. As noted, resource abundance often generates distortions or certain tendencies in an economy, and these distortions then undermine economic performance. Those distortions serve as “transmission mechanisms,” which create and explain the negative correlation between natural resource abundance and economic growth. These countries can be victims of the resource curse if it has one or more transmission channels. Recent studies support the significance of the indirect influence of these transmission channels. These channels negatively affect government policies and decisions in several ways, which would impede economic growth. Accordingly, the harmful effects of these transmission channels are seen in the economic, political and social performance.

It is readily observed from the review of literature that resource abundance has far reaching effect for economic political and social performance. Due to the close inter linkages between all three sectors; the harmful or beneficial effects of resource abundance do not remain confined to a particular side. If resource abundance turns out be a curse for economic development, it also becomes detrimental for social side of the nation. The role played by political institution is of utmost importance for accelerating or mitigating the effects of resource abundance. It is therefore suggested that all three dimension of resource abundance should be studied simultaneously which has been not explored yet. A simultaneous and all-encompassing study will reveal the catalysts and propagation mechanisms of resource abundance as curse or blessing.

**References**


1. Acemoglu, D.; Johnson, S.; Robinson, J.; Thaicharoen, Y. (2003). Institutional causes, macroeconomic symptoms: volatility, crises and growth. Journal of Monetary Economics. 50, 49–123
2. Acemoglu, D., Robinson, J.A. (2008). The role of institution in growth and development. Working Paper 10, Commission on Growth and Development, The World Bank.
3. Acemoglu, D.; Robinson, J. (2012). Why Nations Fail: The Origins of Power, Prosperity, and Poverty. Crown Business, US.
4. Acemoglu, D.; Gallego, F.; Robinson, J.A. (2014). Institutions, human capital and development. Annu. Rev. Econ. pp. 875-912
5. Ades, A.; Di Tella, R. (1999). Rents, Competition, and Corruption. American Economic Review. 89(4), 982– 993.
6. Aghion, P.; Caroli, E.; Garcia-Peñalosa, C. (1999). Inequality and economic growth: The perspective of the new growth theories. Journal of Economic Literature. 37, 1615-1660.
7. Aghion, P.; Howitt, P. (1998). Endogenous Growth Theory. MIT Press.
8. Ahmadov, I.; Mammadov, J.; Aslanli, K (2013). Assessment of Institutional Quality in Resource-Rich Caspian Basin Countries. MPRA Paper No. 47430
9. Akinwale, O. (2012). Empirical analysis of resource curse in Nigeria. International Journal of Economics and Management Sciences. Vol. 1, No. 6, 2012, pp. 19-25
10. Alexeev, M.; Conrad, R. (2009). The Elusive Curse of Oil. Review of Economics and Statistics. 91(3), 586- 598.
11. Alexeev, M.; Conrad, R. (2011). The natural resource curse and economic transition. Economic Systems. 35, 445–461
12. Andersen, J; Aslaksen, S. (2008). Constitutions and the resource curse. Journal of Development Economics. 87(2), 227 246
13. Anthonsen, M.; Löfgren, A.; Nilsson, K. (2009). Natural Resource Dependency and Quality of Governmensmit. University of Gothenburg, School of Business, Economics and Law. Working paper 415.
14. Anthonsen, M.; Löfgren, A.; Nilsson, K. (2013). Natural Resource Dependency and Quality of Government. Economics of Governance, 13:145–168.
15. Apergis, N.; Payne, J. (2014). The oil curse, institutional quality, and growth in MENA countries: Evidence from time-varying cointegration. Energy Economics, 46, 1-9.
16. Arezki, R. & van der Ploeg, F. (2010). Trade policies, institutions and the natural resource curse. Applied Economics Letters. 17 (15). pp. 1443–1451.
17. Atkinson, G.; Hamilton, K. (2003). Savings, Growth and the Resource Curse Hypothesis. World Development, 31 (11). 1793-1807
18. Auty, R.M. (1990). Resource-Based Industrialization: Sowing the Oil in Eight Developing Countries. Oxford University Press, New York.
19. Auty, R M. (2001). The political economy of resource-driven growth. European Economic Review. 45(4-6), 839-846
20. Bakwena, M. (2012). Is it true that good institution alleviates the resource curse? A re-assessment of existing OLS cross country evidence. Botswana Journal of Economics. 10, 14.
21. Baland, J. M.; Francois, P. (2000). Rent-seeking and resource booms. Journal of Development Economics. 61 (2), 527-542
22. Barro, R. J. (1991). Economic Growth in a Cross Section of Countries. The Quarterly Journal of Economics, 106 (2), 407-443.
23. Barro, R.J. (1997). The Determinants of Economic Growth. MIT Press, Cambridge, MA.
24. Barro, R., Lee, J. (1993). Losers and Winners in Economic Growth. Working Paper 4341, NBER.
25. Barro, R., Sala-I-Martin, X. (1995). Economic Growth, New York, McGraw Hill.
26. Becker, G. (1964). Human Capital: A Theoretical and Empirical Analysis. Princeton University Press.
27. Behbudi, D.; Mamipour, S.; Karami, A. (2010). Natural resource abundance, human capital and economic growth in the petroleum exporting countries. Journal of Economic Development. 35 (3). pp. 81–102.
28. Beland, L. P.; Tiagi, R. (2009). Economic Freedom and the “Resource Curse”: An Empirical Analysis. Fraser Institute, Studies in Mining Policy.

a. Bergh, A., Mirkina, I.; Nilsson, T. (2014). Globalization and Institutional Quality—A Panel Data Analysis. Oxford Development Studies. 42 (3). pp. 365–394.
29. Bhattacharyya, S.; Hodler, R. (2010). Natural Resources, Democracy and Corruption. European Economic Review. 54 (4), 608–621.
30. Bjorvatn, K., Farzanegan, M.R. & Schneider, F. (2012). Resource Curse and Power Balance: Evidence from Oil-Rich Countries. World Development. 40 (7). pp. 1308–1316.
31. Bjorvatn, K. & Selvik, K. (2008). Destructive Competition: Factionalism and Rent-Seeking in Iran. World Development. 36 (11). pp. 2314–2324.
32. Blanco, Luisa; Nugent, Jeffrey; and Veenstra, Graham, "Effects of Natural Resource Abundance on Institutions: Which, Where and When?" (2012). Pepperdine University, School of Public Policy Working Papers. Paper 40.
33. Blanco, L.; Grier, R. (2012). Natural resource dependence and the accumulation of physical and human capital in Latin America. Resources Policy. 37, 281–295.
34. Boschini, A. D.; Pettersson, J.; Roine, J. (2007). Resource Curse or Not: A Question of Appropriability. The Scandinavian Journal of Economics. 109 (3), 593–617.
35. Boschini, A. D.; Pettersson, J.; Roine, J. (2013). The Resource Curse and its Potential Reversal. World Development. 43, 19-41.
36. Bravo-Ortega, C.; De Gregorio, J. (2002) The relative richness of the poor? Natural resources, human capital and economic growth. Central Bank of Chile Working Paper No. 139.
37. Brollo, F.; Nannicini, T.; Perotti, R.; Tabellini, G. (2013). The Political Resource Curse. American Economic Review. 103(5): 1759–179.
38. Brückner, M. (2010). Natural resource dependence, non-tradables, and economic growth. Journal of Comparative Economics. 38 (4). pp. 461–471.
39. Brunnschweiler, C. N. (2008). Cursing the Blessings? Natural Resource Abundance, Institutions, and Economic Growth. World Development. 36 (3), 399-419.
40. Brunnschweiler, C.N. & Bulte, E.H. (2008). The resource curse revisited and revised: A tale of paradoxes and red herrings. Journal of Environmental Economics and Management. 55 (3). pp. 248–264.
41. Bulte, E.; Damania, R.; Deacon, R. (2003). Resource abundance, poverty and development. FAO ESA-WP, 04-03
42. Bulte, E.; Damania, R.; Deacon, R. (2005). Resource Intensity, Institutions, and Development. World Development. 33 (7), 1029–1044.
43. Busse, M.; Groning, S. (2013). The resource curse revisited: governance and natural resources. Public Choice. 154:1–20.
44. Butkiewicz, J.L. & Yanikkaya, H. (2010). Minerals, Institutions , Openness , and Growth: An Empirical Analysis. Land Economics. 86 (2). pp. 313–328.
45. Cabrales, A. & Hauk, E. (2011). The Quality of Political Institutions and the Curse of Natural Resources. The Economic Journal. 121. pp. 58–88.
46. Cockx, L. & Francken, N. (2014). Extending the concept of the resource curse: Natural resources and public spending on health. Ecological Economics. 108. pp. 136–149.
47. Cockx, L.; Francken, N. (2015). Is there a Natural Resource Curse on Education Spending? Institute of Development Policy and Management, University of Antwerp. Working paper 2015.02
48. Collier,P. and Goderis,B. (2007) Commodity prices, growth, and the natural resource curse: Reconciling a conundrum. The Centre for the Study of African Economies Working Paper Series, 274, 41p.
49. Collier, P.; Hoeffler, A.; Soderborn, M. (2004). On the Duration of Civil War. Journal of Peace Research. 41(3), 253-273.
50. Collier, P.; Hoeffler, A. (2005). Resource Rents, Governance, and Conflict. Journal of Conflict Resolution. 49, 625-633.
51. Collier, P.; Hoeffler, A. (2009). Testing the Neocon Agenda: Democracy in Resource-rich Societies. European Economic Review. 53(3), 293–308.
52. Corden, W. (1984). Booming sector and Dutch Disease economics: survey and consolidation. Oxford Economic Papers. 36. 359-380.
53. Corden, W., Neary, J. (1982). Booming sector and de-industrialization in a small open economy. The Economic Journal. 92, 825-48.
54. Costantini, V. & Monni, S. (2008). Environment , human development and economic growth. Ecological Economics. 64. pp. 867–880.
55. Daniele, V. (2011). Natural Resources and the 'Quality' of Economic Development. Journal of Development Studies, 47 (4), 545-573.
56. Davis, G. A. (1995). Learning to love the Dutch disease: Evidence from the mineral economies. World Development. 23 (10), 1765-1779.
57. De Rosa, D.; Lootty, M. (2012). Are Natural Resources Cursed? An Investigation of the Dynamic Effects of Resource Dependence on Institutional Quality. World Bank, Policy Research Working Paper 6151.
58. Di John, J. (2011). Is there really a resource curse? a critical survey of theory and evidence. Global Governance. 17 (2). pp. 167–184.

59. Dias, J; Tebaldi, E. (2012). Institutions, human capital, and growth: The institutional mechanism. Structural Change and Economic Dynamics. 23, 300–312.
60. Dietz, S.; Neumayer, E.; De Soysa, Indra (2007). Corruption, the resource curse and genuine saving. Environment and Development Economics. 12, 33–53
61. Douglas, S.; Walker, A. (2013). Coal Mining and the Resource Curse in the Eastern United States. Available at SSRN 2385560.
62. Du Plessis, S. & Du Plessis, S. (2006). Explanations for Zambia's economic decline. Development Southern Africa. 23 (3). pp. 351–369.
63. El Anshasy, A.A. (2011). Oil Windfall Shocks , Government Spending , and the Resource Curse. Journal of Applied Business and Economics. 12 (4). pp. 44–64
64. El Anshasy, A. A. & Katsaiti, M.S. (2013). Natural resources and fiscal performance: Does good governance matter? Journal of Macroeconomics. 37. pp. 285–298.
65. El Anshasy, A.A. (2011). Oil Windfall Shocks , Government Spending , and the Resource Curse. Journal of Applied Business and Economics. 12 (4). pp. 44–64.
66. Elbadawi I. A & Soto R. (2012). "Resource Rents, Political Institutions and Economic Growth," Documentos de Trabajo 413, Instituto de Economia. Pontificia Universidad Católica de Chile.
67. Eregha, P.B.; Mesagan, E. (2016). Oil resource abundance, institutions and growth: Evidence from oil producing African countries. Journal of Policy Modeling, 38 (3), 603-619.
68. Faria, H.; Montesinos-Yufa, H.; Morales, D.; Navarro, C. (2016). Unbundling the roles of human capital and institutions in economic development. European Journal of Political Economy, 45, 108-128.
69. Frankel, J. (2012). The Natural Resource Curse: A Survey of Diagnoses and Some Prescriptions. Harvard Kennedy School (HKS) Faculty Research Working Paper Series. RWP12-014.
70. Gelb, A. (1988). Windfall Gains: Blessing or Curse? Oxford University Press, New York.
71. Gerelmaa, L.; Kotani, K. (2016). Further investigation of natural resources and economic growth: Do natural resources depress economic growth?. Resources Policy, 50, 312-321.
72. Godwin, E. A.; Chuka, C. (2014) Natural Resources, Human Capital, and Economic Development in Nigeria: Tracing the Linkages. Journal of Economic Sustainability and Development., 5, 35–52.
73. Gylfason, T.; Herbertsson, T.; Zoega, G. (1999). A mixed blessing: Natural resources and economic growth. Macroeconomic Dynamics. 3, 204-225.
74. Gylfason, T. (2001). Natural resources, education, and economic development. European Economic Review. 45, 847 859.
75. Gylfason, T. and Zoega, G. (2006). Natural Resources and Economic Growth: The Role of Investment. World Economy, 29 (8), 1091–1115.
76. Hall, S.; Ahmad, M. (2014). Revisiting the institutions–growth nexus in developing countries: The new evidence. New Zealand Economic Papers. 48(3), 301–312.
77. Hall, R.E., Jones, C.I. (1999) Why do some countries produce so much more output per worker than others?, The Quarterly Journal of Economics, 114(1), 83-116.
78. Hausmann, R.; Rigobon, R. (2002). An alternative interpretation of the 'resource curse': Theory and policy implications. National Bureau of Economic Research. Working Paper 9424.
79. Hodler, R. (2006). The curse of natural resources in fractionalized countries. European Economic Review, 50, 1367-1386.
80. Isham, J.; Woolcock, M.; Pritchett, L.; Busby, G. (2005). The Varieties of Resource Experience: Natural Resource Export Structures and the Political Economy of Economic Growth. The World Bank Economic Review. 19 (2), 141–174.
81. James, A.; Aadland, D. (2011). The Curse of Natural Resources: An Empirical Investigation of U.S. Counties. Resource and Energy Economics, 33 (2), 440–453.
82. James, A. (2015). The resource curse: A statistical mirage? Journal of Development Economics. 114, 55–63
83. Karabegovi□, A. (2009). Institutions, Economic Growth, and the 'Curse' of Natural Resources.
84. Karl, T. L. (1997). The Paradox of Plenty: Oil Booms and Petro-States. Studies in International Political Economy (Book 26). University of California Press.
85. Kolstad, I. (2009). The resource curse: which institutions matter? Applied Economics Letters. 16 (4). pp. 439– 442.
86. Kronenberg, T. (2004). The curse of natural resources in the transition economies. Economics of Transition. 12 (3), 399–426
87. Larsen, E.R. (2006). Escaping the Resource Curse and the Dutch Disease□? When and Why Norway Caught up with and Forged Ahead of Its Neighbors. American Journal of Economics and Sociology. 65 (3).
88. Lederman, D.; Maloney, W. F. (Eds.) (2007). Natural Resources: Neither Curse nor Destiny. The World Bank. Stanford University Press.
89. Lederman, D. & Maloney, W.F. (2008). In Search of the Missing Resource Curse. Economía. 9 (1). pp. 1–56.
90. Leite, C.; Weidmann, J. (1999). Does Mother Nature Corrupt? Natural resources, corruption and economic growth. IMF Working Paper 99/85.

91. Leong, W. and Mohaddes, K. (2011). Institutions and the Volatility Curse. CWPE 1145. Cambridge Working Papers in Economics, Faculty of Economics, University of Cambridge.
92. Listhaug, O. (2005) Oil wealth dissatisfaction and political trust in Norway: A resource curse? West European Politics. 28 (4), 834-851
93. Lucas, R. (1988). On the mechanics of economic development. Journal of Monetary Economics. 22, 3-42.
94. Manuelli, R. E.; Seshadri, S. (2014). Human Capital and the Wealth of Nations. American Economic Review, 104(9): 2736-2762.
95. Manzano, O; Rigobon; R. (2001). Resource curse or debt overhang? National Bureau of Economic Research. Working paper 8390.
96. McKinnon, R. (1976). International Transfers and Non-traded Commodities: The adjustment problem, in Leipsiger, D. (ed.), The International Monetary System and the Developing Nations, Washington DC. Agency for International Development.
97. Mavrotas, G; Murshed, S. M.; Torres S. (2011). Natural Resource Dependence and Economic Performance in the 1970 2000 Period. Review of Development Economics. 15(1), 124–138.
98. Medeiros Costa, H. C.; dos Santos, E. M. (2013). Institutional analysis and the “resource curse” in developing countries. Energy Policy. 63, 788–795
99. Mehlum, H.; Moehne, K.; Torvik, R. (2006). Institutions and the Resource Curse. Economic Journal. 116 (508), 1-20.
100. Mehlum, H., Moene, K. & Torvik, R. (2006). Cursed by Resources or Institutions? The World Economy. 29 (8). pp. 1117–1131.
101. Mehrara, M. (2009). Reconsidering the resource curse in oil-exporting countries. Energy Policy. 37 (3). pp. 1165–1169.
102. Mehrara, M., Alhosseini, S.M.S., and Bahramirad, D. (2011). Resource Curse and Institutional Quality in Oil Countries. Middle Eastern Finance and Economics Journal. Issue 9.
103. Mironov, V.V., Petronevich, A.V (2015). Discovering the signs of Dutch disease in Russia Resources Policy (46) 97 112.
104. Murshed, S.M. (2007). What turns a blessing into a curse? The political economy of natural resource wealth. The Pakistan Development Review. 46 (4). pp. 351–377.
105. Nili, M and Rastad, M (2007). Addressing the growth failure of the oil economies: The role of financial development. The Quarterly Review of Economics and Finance, , vol. 46, issue 5, 726
106. Norman, C. (2009). Rule of Law and the Resource Curse: Abundance Versus Intensity. Environmental & Resource Economics. 43(2), 183-207.
107. North, D. (1994). Economic performance through time. American Economic Review. 84, 359–368.
108. Olayungbo, D. O.; Adediran, K. A. (2017). Effects of Oil Revenue and Institutional Quality on Economic Growth with an ARDL Approach. Energy and Policy Research. 4(1), 44–54.
109. Oskenbayev, Y., Yilmaz, M. & Abdulla, K. (2013). Resource concentration, institutional quality and the natural resource curse. Economic Systems. 37 (2). pp. 254–270.
110. Papyrakis, E.; Gerlagh, R. (2004). The resource curse hypothesis and its transmission channels. Journal of Comparative Economics. 32 (1), pp.181–193.
111. Papyrakis, E.; Gerlagh, R. (2007). Resource abundance and economic growth in the United States. European Economic Review. 51, 1011–1039
112. Pike, J. (2010). A Resource Curse for Institutions: Rent Dependency and Quality of Government. Boston College Department of Economics.
113. Rodriguez, F.; Sachs, J. (1999). Why do resource-abundant economies grow more slowly? Journal of Economic Growth. 4, 277-303.
114. Rodrik, D.; Subramanian, A.; Trebbi, F. (2004). Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development. Journal of Economic Growth. 9(2), 131-165.
115. Robinson, J.; Torvik, R.; Verdier, T. (2006). Political foundations of the resource curse. Journal of Development Economics. 79, 447– 468
116. Romer, P. (1990). Endogenous Technological Change. Journal of Political Economy, no. 98, 71–102.
117. Ross, M. (1999). The political economy of the resource curse. World Politics. 51, 297-322.
118. Ross, M. (2001). Does oil hinder democracy? World Politics. 53, 325-361.
119. Ross, M (2004). What Do We Know about Natural Resources and Civil War? Journal of Peace Research. 41(3), 337–356
120. Ross, M. (2015). What have we learned about the resource curse? Annual Review of Political Science. 18, 239-259.
121. Sachs, J.; Warner, A. (1995). Revised 1997, 1999. Natural resource abundance and economic growth. National Bureau of Economic Research, Working paper No. 5398.
122. Sachs, J.; Warner, A. (1999). The big push, natural resource booms and growth. Journal of Development Economics 59, 43-76.

123. Sachs, J.; Warner, A. (2001). The curse of natural resources. European Economic Review. 45, 827-838.
124. Sachs, J. (2007) How to handle the macroeconomics of oil wealth, in: M. Humphreys, J. D. Sachs, J. E. Stiglitz (eds.) Escaping the Resource Curse, Columbia University Press, 173–193.
125. Sala-i-Martin, X. (1997). I just ran two million regressions. American Economic Review, Papers and Proceedings.
126. Sala-i-Martin, X.; Doppelhofer, G.; Miller, R (2004). Determinants of Long-Term Growth: A Bayesian Averaging of Classical Estimates (BACE) Approach. American Economic Review. 94(4), 813-835.
127. Sala-i-Martin, X.; Subramanian, A. (2013). Addressing the natural resource curse: an illustration from Nigeria. Journal of African Economies. 22 (4), 570–615.
128. Sandbu, M.E. (2006). Natural wealth accounts: A proposal for alleviating the natural resource curse. World Development. 34 (7). pp. 1153–1170.
129. Sarmidi, T.; Hook Law, S.; Jafari, Y. (2014). Resource Curse: New Evidence on the Role of Institutions. International Economic Journal. 28 (1), 191-206.
130. Satti, S. L.; Farooq, A.; Loganathan, N.; Shahbaz, M. (2014). Empirical evidence on the resource curse hypothesis in oil abundant economy. Economic Modelling. 42, 421–429
131. Schultz, T. W. (1961). Investment in Human Capital. American Economic Review. 51(1), 1–17.
132. Smith, B. (2004). Oil Wealth and Regime Survival in the Developing World, 1960–1999. American Journal of Political Science. 48(2), 232–246.
133. Smith, B. (2015). The resource curse exorcised: Evidence from a panel of countries. Journal of Development Economics. 116, 57–73
134. Sovacool, B.K. (2010). The political economy of oil and gas in Southeast Asia: heading towards the natural resource curse? The Pacific Review. 23 (2). pp. 225–259.
135. Stijns, J.P. (2006). Natural resource abundance and human capital accumulation. World Development. 34 (6), 1060-1083.
136. Suslova, E. and Volchkova, N. (2012). Human Capital, Industrial Growth and Resource Curse. Available at SSRN: https://ssrn.com/abstract=1023523
137. Torres, N., Afonso, O. & Soares, I. (2013). Natural resources, wage growth and institutions - a panel approach. The World Economy. 36 (5). pp. 661–687.
138. Torres, N., Afonso, Ó. & Soares, I. (2012). Oil abundance and economic growth-a panel data analysis. The Energy Journal. 33 (2). pp. 119–148.
139. Torvik, R. (2002). Natural resources, rent-seekingand welfare. Journal of Development Economics. 67 (2), 455-470.
140. Torvik, R. (2009). Why do some resource-abundant countries succeed while others do not? Oxford Review of Economic Policy. 25(2), 241–256.
141. Tsui, K. (2011). More Oil, Less Democracy: Evidence from Worldwide Crude Oil Discoveries. The Economic Journal. 121(551), 89–115.
142. Van Wijnbergen, S. (1984a). Inflation, Employment and the Dutch Disease in Oil Exporting Countries: A short Run Disequilibrium Analysis. Quarterly Journal of Economics. 99(2), 233-250
143. Van Wijnbergen, S. (1984b). The 'Dutch Disease': A Disease after All? The Economic Journal. 94, 41-55.
144. Welsch, H. (2008). Resource Dependence, Knowledge Creation, and Growth: Revisiting the Natural Resource Curse. Journal of Economic Development. 33 (1). pp. 45–70.
145. Wiens D. (2013(. Natural Resources and institutional development. Journal Theory and Political. 26(2): 197- 221.
146. Williams, A. (2011). Shining a Light on the Resource Curse: An Empirical Analysis of the Relationship Between Natural Resources, Transparency, and Economic Growth. World Development. 39 (4). pp. 490–505.
147. Yang, B. (2010). Resource curse: the role of institutions versus policies. Applied Economics Letters. 17 (1). pp. 61–66.

# APPENDIX F.

***The Second Article:*** The Manuscript is prepared and submitted for publication to *Energy Economics*

## An Analysis of the Impact of Rents from Non-renewable Energy Resources and changes in Human Capital on Institutional Quality: A case Study of Kuwait

**Abstract**

Non-renewable energy resources are important inputs for industries that support local industrial production and employment. However, many authors believe that such resources have a damaging effect on institutional quality, which is the quality of a country's decision-making mechanisms, and on human capital, which is usually described as the accumulation of education in a specified population. This collective damage thus impedes economic growth and development. The present study analyses the impact of resource rents from non-renewable energy resource and human capital on institutional quality in Kuwait, using an autoregressive distributed lag (ARDL) approach based on data for the period 1984 to 2014.The results indicate that an increase in rents from non-renewable energy resources has decreased institutional quality, whereas human capital enhances institutional quality both in the short and long-run. This study concludes that an investment in human capital could help insulate Kuwait from the damaging effect of over-reliance on non-renewable energy resource rents.

**Keywords: Non-renewable Energy Resources; Resource Rents; Institutional Quality; Human Capital; Kuwait; Resource Curse**

## 1. Introduction

The notion in economics that abundant resources can be a curse rather than a blessing has a long history. From as early as the 16th century, economists noted the destabilizing effects of the influx of gold from Latin America (Auty, 1993; Prebisch, 1950; Singer 1950). More recently, economists observed that some of the fastest growing economies are largely resource poor, while resource-abundant countries have suffered virtual economic collapse. This narrative often points to the presence of the so-called "Resource Curse", explaining how resource abundant countries suffer from sluggish economic growth and development (Moradbeigi and Law, 2017; Ahmed et al., 2016; Bulte et al., 2005; Rodriguez and Sachs, 1999).

Despite this, natural resources serve as useful inputs and raw materials for domestic industries that stimulate local industrial production. Despite the resource curse narrative, economic history is replete with accounts of nations that achieve sustained economic growth and development, such as Botswana with its rich diamond fields, Chile with copper, and Norway with petroleum resources (Omodadepo and Akanni, 2013; Asekunowo and Olaiya, 2012; Akinlo, 2012; Cavalcanti et al., 2011; Poelhekke and van der Ploeg, 2010; Alexeev and Conrad, 2009; Arezki and van der Ploeg, 2007). In particular, oil wealth has been shown to be beneficial to Gulf Countries with national income from oil exports being associated with higher life expectancy, lower child mortality rates, higher electricity use per capita, higher per capita income and consumption levels, and better physical infrastructure than oil-poor countries (Hvidt, 2013; Sachs, 2007; Ross, 1999; Karl, 1997).

This paradox has left economists searching for the underlying factors responsible for the varying experiences of countries and the mechanisms through which resource endowments could either impede or enhance economic growth. Several studies have highlighted the role of institutional quality and human capital as transmission channels of the resource curse (Oskenbayev et al., 2013; Bulte et al., 2005), where resource wealth crowds out growth-enhancing activity, thus affecting growth (Sovacool, 2010; Welsch, 2008). Institutional quality is a concept that captures the effectiveness of law, individual rights, and government regulations and services (Hodgson, 2006; Knack and Keefer, 1995), whereas human capital is the accumulation of skills and knowledge across a society (Armstrong, 2006).

The explanation of the resource curse that focuses on institutional quality and political factors (Caselli and Cunningham, 2009; Rosser, 2006) has a principal argument that resource rents from natural resources, as measured by income from oil, gas, and minerals, tend to increase corruption and rent-seeking behavior (Mavrotas et al., 2011; Dalgaard and Olsson, 2008; Isham et al., 2005; Woolcock et al., 2001; Leamer et al. 1999). In resource rich countries, the state typically owns natural resource industries, which encourages the abuse of resource windfalls by public officials, damages the quality of political institutions, and delays economic progress (Sala-i-Martin and Subramanian, 2013; Robinson et al., 2006; Bulte et al., 2005; Leite and Weidmann, 1999). There has been an upsurge of interest regarding the relationship between natural resource rents and institutional quality; the interested reader is referred to Antonakakis et al., 2017; Douglas and Walker, 2017; Okada and Samreth, 2017; Olayungbo and Adediran, 2017; Eregha and Mesagan, 2016; Sala-i-Martin and Subramanian, 2013; Busse and Gröning, 2013; Anthonsen et al., 2012; Torvik, 2009; Brunnschweiler, 2008; Costantini and Monni, 2008; Mehlum et al., 2006; Easterly and Levine, 2003; and Ross, 1999. These past studies motivated the aim of this paper and confirm the importance of examining the relevance of what is known as the political resource curse (Ross, 2015) in Kuwait as a case study. One of the main motives is that there have been no previous studies about Kuwait that have examined the political resource curse. The second motivation is that institutional quality is recognized by most economists as an important factor for economic development (Acemoglu et al., 2005; Acemoglu and Robinsons, 2013) that raises the growth potential in the economy (Romer, 1986; Lucas, 1993; Acemoglu et al., 2005) and the per capita level of real income in the country (Góes, 2015). Countries with strong institutional quality utilize human and physical capital more efficiently and attract investment, which results in long-run growth (Robinson et al., 2005).

Another significant question has arisen that is related to whether human capital is having any impact on institutional quality. Like institutional quality, human capital plays a key role in economic growth and development. Moreover, human capital shows an important role in resource curse studies. With regard to this role, Bravo-Ortega and De Gregorio (2005) assert that resource rich countries that have escaped the resource curse tend to have a higher human capital level. Suslova and Volchkova (2012) recommend setting educational policies directed at a skilled labor force, as it is crucial to guarantee economic development sustainability in resource rich nations. Accordingly, the significant role of human capital in this study cannot be neglected.

The importance of human capital and institutions as key drivers of economic growth and development has gained importance in the literature and it is broadly acknowledged

(Faruq and Taylor, 2011; Hanushek and Woessmann, 2007). Yet, the associations between institutions and human capital remains the subject of ongoing debate, with some studies suggesting an interdependent relationship between institutional quality and human capital (Tebaldi and Elmslie, 2013; Dias and Tebaldi, 2012; Coe et al., 2009; Castello-Climent, 2008; Glaeser et al., 2004; Engerman and Sokoloff, 2002; Lau et al., 1991; Psacharopoulos, 1994). Based on this argument, our study questions whether human capital has any link to institutional quality as a clarification step to give a full picture of the relationships that may exist among the selected variables.

In fact, there is no consensus over the link between institutions, human capital, and resource rents, and many suggest that the link differs for each country (Brunnschweiler and Bulte, 2008; Bulte et al., 2005). As a result, the impact of resource rents on institutional quality, as well as the impact of human capital on institutional quality remains of interest, especially for policy makers and producers of resources in developing countries (Torres et al., 2012). In this light, this study sets out to investigate the short and long-run impacts of rents from non-renewable energy resources (NRER) and human capital (HC) on institutional quality (IQ) in an oil rich country located in the Gulf region, since only a limited number of studies have conducted this investigation in resource rich countries found in the Middle East and North Africa (MENA) region. Accordingly, Kuwait has been chosen as an appropriate case study because it continues to be overly reliant on oil, which accounts for about 40% of Gross Domestic Product (GDP) and 92% of export earnings (OPEC, 2019), thereby making it a prime candidate for the undesirable effects of the resource curse. Although Kuwait has tried to shield itself from the deleterious effects of oil exports by establishing a Sovereign Wealth Fund, the Kuwait Investment Authority (KIA) with funds reaching over $500 billion (SWFI, 2018), further examination of the impact of natural resources on its economy is essential to identifying the appropriate approaches to attain sustainability and long-term growth.

This paper is novel because, to the authors' knowledge, it is the first time-series study of its nature to be conducted in Kuwait that examines the impact of non-renewable energy resources and human capital on institutional quality. Most of the previous studies in the resource curse literature that include Kuwait in the sample are either panel or cross-sectional data approaches (Kakanov et al., 2018; Lehne et al., 2014; Frankel, 2012; Cavalcanti et al., 2011; Haber and Menaldo, 2011).

This will be of interest to an international audience as Kuwait serves as a good example of a small, oil rich country with a relatively high per capita income. Evidence from such economies are sparse in the literature and given the context-specific effects of the resource curse, this study provides another perspective on this phenomenon, as incorporating different variables helps in delivering more profound understandings into the relevance of the resource curse.

This research paper is organized as follows: Section 2 provides a review of the literature, Section 3 describes the empirical model and the estimation procedure, describes the model variables and data sources, and illustrates the results and discussion, and finally, Section 4 concludes and provides some policy recommendations.

## 2. Literature Review

Institutional quality is a concept that encapsulates individual rights, beliefs, and rules that shape behaviors and formulate collective action, hence conditioning development (Islam and Montenegro, 2002; North, 1990). Economists generally agree that good or poor outcomes from any policies designed to enhance economic growth are mainly contingent on the institutional quality within an economy (Farhadi et al., 2015; Sarmidi et al., 2014; Robinson et al., 2005; North, 1994; Barro, 1991). The effects of institutions on growth have been examined in many studies (Haapanen and Tapio, 2016; Perera and Lee, 2013; Acemoglu and Robinson, 2008; Aidt et al., 2008; Rodrik et al., 2004; Acemoglu et al., 2002; Hall and Jones, 1999).

Knack and Keefer (1997) suggested that finding a correct measure of institutional quality is considered the most difficult task in such studies, and they see that the ideal measures would consist of objective evaluations, which are comparable over time and across countries. However, judging across this literature field, several measures of institutional quality have been used. For instance, Expropriation Risk was used in Acemoglu et al. (2001); the Fraser Institute measure, Economic Freedom of the World, was used by, for example, Beland and Tiagi (2009); the Freedom House index was used in Barro and Sala-i-Martin (1997); the World Bank Governance Indicators was used by Sala-i-Martin and Subramanian (2013), Rodrik et al. (2004), and Easterly and Levine (2003); and finally the International Country Risk Guide (ICRG) was used by Knack and Keefer, (1997), Hall and Jones (1999), Knack (1999), Chong and Calderon (2000), and in the resource curse literature by Okada and Samreth (2017), Busse and Gröning (2013), and Boschini et al. (2013).

In terms of research that has specifically looked at the institutions/political explanation of the resources curse, several studies have identified that a negative relationship between natural resource abundance and macroeconomic performance tends to persist in countries with already poor institutional quality (Boschini et al. 2013; Mehlum et al., 2006; Papyrakis and Gerlagh, 2004), because resource wealth and poor institutional quality allow interest groups to closely control resource rents, hence affecting economic development (Boschini et al., 2007; Bulte et al., 2005; Isham et al., 2005; Rodrik et al., 2004; Karl, 1997). Similarly, Olanyugbo and Adediran (2017) found that low institutional quality and high oil revenues promote economic growth in the short-run but retard it in the long-run. Other studies that support the same view have highlighted the weakening effect of natural resources on institutions, resulting in the institutional resource curse (Guriev et al., 2009; Boix, 2003).

Other papers, such as Apergis and Payne (2014) and Costa and Santos (2013), argued that resource rents actively cause a deterioration in institutional quality, and this is not solely a problem for countries with pre-existing poor institutional quality (Ji et al., 2014; Cabrales and Hauk, 2011). It should also be noted that there are papers that dispute the link between resource rents, institutional quality, and the resource curse phenomena, such as Brunnschweiler and Bulte (2008). Similarly, Brunnschweiler (2008) found no evidence of negative indirect effects of resource abundance through the institutional transmission channels, concluding that resource dependence is unrelated to growth and institutional quality. Similarly, Yang (2010) argued that institutional quality has no effect on the severity of the resource curse; however, the missing link between institutional quality and resource in these findings show how these countries followed good policies that minimized the negative impacts of natural resources on growth. Lehne et al. (2014) mentioned that resource wealth can be utilized to strengthen economic and political institutions, develop the business environment, and control corruption by raising the pay of regulators and officials.

Despite these conclusions, the literature is deficient on how other important factors in a resource-rich economy, such as human capital, could affect the institutional quality. Generally, few studies have found a link between natural resources, institutional quality, and human capital. Those that have found a link suggest that high levels of oil production (and resulting incomes) coupled with weak institutions result in little opportunity to improve educational levels (Suslova and Volchkova, 2012; Gylfason, 2001; Aron, 2000). Moreover, Bulte et al. (2005) found that natural resources damage institutional quality and then these institutions harm human capital, thus resource rich countries tend to experience lower levels of human development. Gylfason (2001) found that low investment in education in resource rich countries is a critical reason behind their slow development, as it relates it to the security of income from the resource rents and the fact that resource extraction is very capital-intensive. An alternative explanation was introduced by Isham et al. (2005), which they called a “delayed modernization” effect, is that the ruling elite in countries with point-source resources are encouraged to impede modernization, which includes education and modern industry, since they consider it to be a risk to them of losing power.

What emerges in the wider literature is that institutional quality and human capital are interdependent. Several studies have analyzed the link between human capital and institutions from different angles (Tebaldi and Elmslie, 2013; Dias and Tebaldi, 2012; Coe et al., 2009; Catello-Climent, 2008; Glaeser et al., 2004; Engerman and Sokoloff, 2002). These studies found that countries with strong institutional quality, such as protection of property rights, control of corruption, market friendly policies, and effective judiciary system, experience a higher rate of innovation (Tebaldi and Elmslie, 2013), and greater R&D spillover (Seck, 2011), R&D investments, and human capital formation (Coe et al., 2009). It has been argued that human capital accumulation contributes positively to institutional quality, which fosters growth (Faria et al., 2016; Galor et al., 2009; Castello-Climent, 2008; Glaeser et al., 2004; Lipset, 1960). Human capital introduces awareness, creativity, and behavior in the society, and hence increases institutional quality (Psacharopoulos, 1994; Lau, et al., 1991). Additionally, Lucas (1988) asserted that human capital accumulation produces institutions symbolized by the average knowledge in the society. While this knowledge creation depends on institutional quality (Romer, 1990), as good institutions facilitate the procedure of registering new patents, encourage new projects, distribute ideas, and improve enforcement of property rights, all aspects that prompt R&D activities (Tebaldi and Elmslie, 2013). Contrary to these studies, Acemoglu et al. (2014, 2005) found that human capital has little impact on economic growth, but this impact is likely to be an outcome of institutions.

Generally, the literature shows that resource rents in these resource rich countries damages institutional quality, while human capital accumulation has been found to improve institutional quality, which could provide some insulation from the negative impacts of the resource curse. Higher educational levels help in the management of natural resources by supporting technologies and innovations that assure the efficient use of resources and reduce the dependence on them. Furthermore, education encourages the development of the tradeable sectors as an alternative to high dependence on resource sectors (Kurtz and Brooks, 2011; Stijns, 2006).

As it is revealed in the literature that human capital and natural resource wealth (Guriev et al., 2009) are important determinants of institutional quality, other factors, such as political institutions (Olson, 2000; North, 1990), geography (Robinson et al., 2005), history (Becker et al., 2016), and ethnic fractionalization (Alesina et al., 1999), are out of the scope of this study because they are beyond the possible explanations of the resource curse theory.

All in all, since past studies reveal different findings, it is crucial to understand the complex dynamics of the resource curse from a different perspective, since natural resources should not be the only factor that ruins or enhances the institutional quality in a resource-rich country. As the effects of natural resources vary across countries, the examination is better conducted as a case study in Kuwait to be able to pinpoint the appropriate policies and to understand the situation in an economy that is over reliant on natural resources. To better comprehend the political resource curse, the next section provides the empirical test of this view.

## 3. Empirical Model and Estimation Procedure

In this section, we explain a model to assess the impact of resource rents (RR) and human capital (HC) on institutional quality (IQ) with per capita GDP (PGDP) as covariates to check the role of accumulation of knowledge and income in determining the institutional quality. PGDP is used as a proxy for the degree of development in a country (following Olayungbo and Adediran, 2017; Akpan and Chuku, 2014; Busse and Gröning, 2013; Arezki and van der Ploeg, 2011). It is assumed that the higher the income, the higher the demand for better institutional quality and transparency (Treisman, 2000). In addition, more developed countries enjoy higher per capita income, which means that they are rich in financial resources that can build better institutions and improve government regulations (Busse and Gröning, 2013).

The autoregressive distributed lag (ARDL) method is used because it gives long-term consistent estimates irrespective of variable integration I(1) or I(0) (Olayungbo and Adediran, 2017; Badeeb and Lean, 2017). This approach performs well for a small sample size in which the short-run and long-run effects of the independent variables on the dependent variable can be assessed simultaneously (Pesaran et al., 2001). Finally, all variables are assumed to be endogenous, and thus the endogeneity problems associated with the Engle–Granger method can be avoided (Pesaran, 2006). The linear form of the equation is written as follows:

$$\boldsymbol{IQ = \alpha_o + \theta_1 RR_t + \theta_2 HC + \theta_4 PGDP_t + \mu_t.} \quad \textbf{(1)}$$

The General form of the ARDL model of equation (1) is as follows:

$$\begin{aligned}\boldsymbol{\Delta IQ_i} = \boldsymbol{\alpha_0} + \sum_{i=1}^{t} \boldsymbol{\delta_i \Delta IQ_{t-i}} + \sum_{i=1}^{t} \boldsymbol{\rho_i \Delta RR_{t-1}} + \sum_{i=1}^{t} \boldsymbol{\emptyset_i \Delta PGDP_{t-i}} \\ + \sum_{i=1}^{t} \boldsymbol{\varphi_i \Delta HC_{t-i}} + \boldsymbol{\lambda_1 IQ_{t-1}} + \boldsymbol{\lambda_2 RR_{t-1}} + \boldsymbol{\lambda_3 HC_{t-1}} \\ + \boldsymbol{\lambda_4 PGDP_{t-1}} + \boldsymbol{\mu_t}\end{aligned} \tag{2}$$

where $\alpha_0$ is the drift component and the terms $\delta_i$,$\rho_i$, $\emptyset_i$, and $\varphi_i$ are the parameters used for short-run analysis, while $\lambda_1$, $\lambda_2$, $\lambda_3$, and $\lambda_4$ are used for estimating long-run parameters and $\mu_t$ is the error term. The Wald restriction test is used to test the long-run relationship or co-integration between the dependent and the independent variables. The value of the F-test is taken by applying the coefficient diagnostic Wald restriction test on long-run variable parameters. The hypothesis for the co-integration test is:

$\boldsymbol{H_0 = \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = 0}$ **(Means no co-integration)**

$\boldsymbol{H_1 = \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq 0}$ **(Means there is co-integration).**

The F-test is used to check the existence of co-integration and a long-run[1] relationship between the dependent and independent variables. The orders of the lag length in the ARDL model are selected through the Akaike information criteria (AIC).

Under the assumption of steady-state when the economy seeks to find an equilibrium condition, the long-run equations is $\Delta IQ_i = 0$,

which means that $\Delta IQ = IQ_t - IQ_{t-1} = 0 \Rightarrow IQ_t = IQ_{t-1}$.

By applying the above assumption and dividing by $\lambda_1$, equation (2) can be written in the long-run form as follows:

$$\boldsymbol{\frac{\lambda_1}{\lambda_1} IQ_t = \frac{\lambda_2}{\lambda_1} RR_{t-1} + \frac{\lambda_3}{\lambda_1} HC_{t-1} + \frac{\lambda_4}{\lambda_1} PGDP_{t-1}}. \tag{3}$$

Now by re-parameterizing,

$$\boldsymbol{IQ_t = \psi_o + \psi_1 RR_{t-1} + \psi_2 HC_{t-1} + \psi_3 PGDP_{t-1}}. \tag{4}$$

[1] In this study, the long-run is the average effect of independent variable from 1984–2014, while the short-run is contingent on lags of dynamic model.

Now the $\psi_1$, $\psi_{2,} and\ \psi_3$ are the long-run parameters; their values and signs will be determined by the long-run relationship between the dependent variable and independent variables in the model. For short-run analysis, the error correction model is used.

When a long-run relationship exists between the variables, then there is an error correction representative model, so the following error correction model runs in the third step:

$$\Delta IQ_i = \alpha_0 + \sum_{i=1}^{t} \delta_i \Delta IQ_{t-i} + \sum_{i=1}^{t} \rho_i \Delta RR_{t-1} + \sum_{i=1}^{t} \emptyset_i \Delta PGDP_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta HC_{t-i} + \gamma ECM_{t-1}. \quad (5)$$

The error correction model indicates the speed of the adjustment of the short-run shocks back to a long-run equilibrium. The coefficient of $ECM_{t-1}$ determines the speed of adjustment of the short-run shocks toward the long-run equilibrium in the case of any disturbance.

### 3.1 Data and Description of Variables

Data on PGDP was retrieved from the World Development Indicators (WDI) provided by the World Bank (2017) for the period 1984–2014 (Figure 1). PGDP is measured in US dollars and divided by the population of Kuwait for each year of period of analysis to get per capita GDP; the population data were taken from the World Bank (2017).

Human Capital (HC) is challenging to measure, but it is often regarded as the accumulation of education in a country (Sun et al., 2018). Human capital theory explains how education is a significant source of human capital, which in time is an important component in the economic growth of any country (Acevedo, 2008). Data were obtained from the Penn World Table (PWT) v9.0 (Figure 2) and referred as the Human capital index (Feenstra et al., 2015). PWT introduced the human capital index based on the average years of schooling from Barro and Lee (2013) and an assumed rate of return in terms of education (Psacharopoulos, 1994). Past studies have confirmed that education introduces awareness and creativity in society, discourages corruption and rent-seeking behaviors, and hence increases the quality of institutions (Psacharopoulos, 1994; Lau et al., 1991).

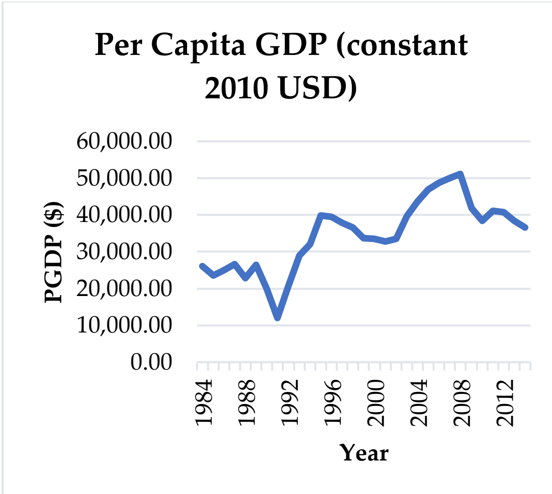
Thus, this study included the human capital index (following Kim and Lin, 2017) to test the impact of education on institutional quality.

Corruption index (CI) is used as a proxy for Institutional Quality (IQ), which is an approach used by a range of studies (Busse and Gröning, 2013; Tebaldi and Elmslie, 2013; Boschini et al., 2013; Knack and Keefer, 1995). Data were taken from the ICRG by the PRS Group from 1984 to 2014 (ICRG, 2017). The ICRG is a widely used source because of its comprehensive coverage over time and countries. The majority of the observations start from 1982 and are measured from low to high: the higher the score a country gets, the better the institutional quality and the lower the score, the worse (Knack and Keefer, 1995).

CI is measured as control of corruption on a scale from 0 to 6 (where 0 means the political risk is high and 6 means the risk is low), but in this paper, this score was inverted to convert it into corruption, which is an approach used by Okada and Samreth (2017) (Figure 3).

This variable assesses the level of corruption within a political system and includes financial corruption (e.g., demands for special payments and bribes in connection with import and export licenses, exchange controls, or tax assessments), excessive patronage, nepotism, secret party funding, 'favor-for-favors', job reservations, and suspiciously close ties between politics and business (ICRG, 2017; Busse and Gröning, 2013).

Resource rents (RR) are assumed to lead to rent-seeking behaviors and corruption in a resource rich country (Brunnschweiler, 2008; Stijns, 2005); thus, this variable is taken as an independent variable to check the impact of non-renewable energy resources on institutional quality. Resource rents are defined as the *total* percentage of GDP associated with sales of natural resources, with data taken from the World Development Indicators (World Bank, 2017) (Figure 4). This indicator is commonly used (Okada and Samreth, 2017; Elbadawi and Soto, 2015; Farhadi et al., 2015; Bhattacharyya and Hodler, 2014; Anthonsen et. al, 2012).



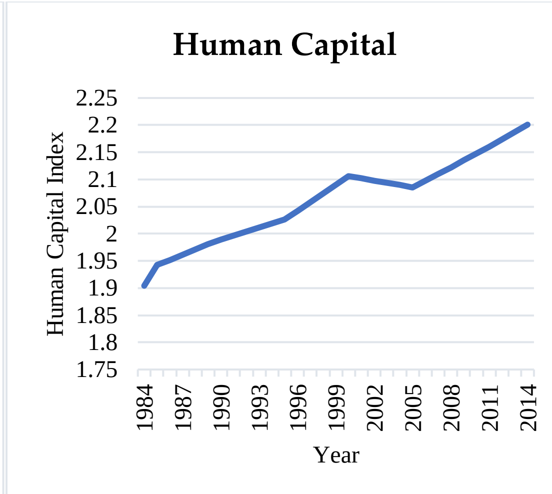
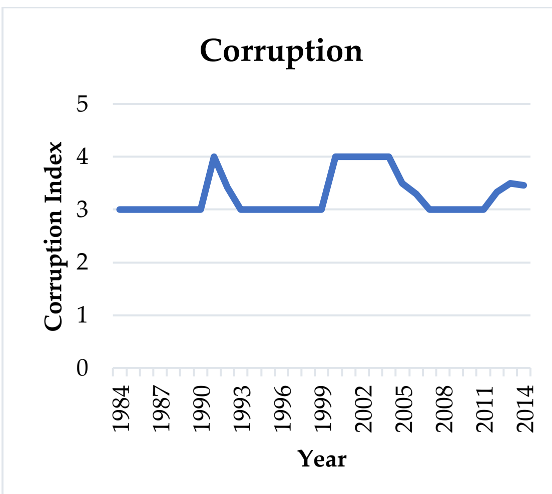




**Figure 1.** Per Capita GDP (constant 2010 USD).
Source: Author, based upon data taken from the World Bank (2017).

**Figure 2.** Human Capital Index.
Source: Author, based upon data taken from the Penn World Table (Feenstra et al., 2015).



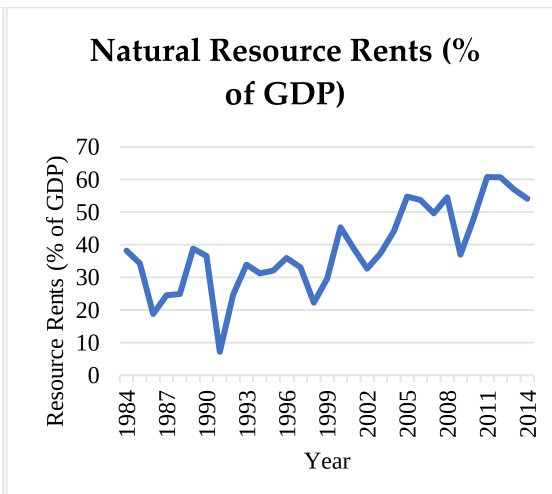




**Figure 3.** Corruption Index.
Source: Author, based upon data taken from the ICRG (2017).

**Figure 4.** Natural Resource Rents (% of GDP).
Source: Author, based upon data taken from World Bank (2017).

## 3.2 Results

Checking the order of integration of variables is a precondition of any co-integration model. For this purpose, augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests were applied. The results of unit root test are reported in Table 1. The probability values are given in parenthesis. The results from both tests were consistent. For PGDP, human capital, and institutional quality, the null hypotheses of the unit root could not be rejected at the 5% level of significance. All these variables were integrated of order 1, i.e., I(1). The other variable under consideration was resource rents and it was stationary at level, I(0).

**Table 1: Results of Unit Root Test**

| Variables | Augmented Dickey Fuller Test | | Phillips Perron Test | |
|---|---|---|---|---|
| | Level | 1st Difference | Level | 1st Difference |
| **Per capita GDP** | –2.131190 (0.2348) | –4.714490 (0.0007***) | –2.192851 (0.2128) | –4.810297 (0.0006***) |
| **Human Capital** | –2.418022 (0.1458) | –3.027859 (0.0454**) | –1.362477 (0.5870) | –2.946930 (0.0047***) |
| **Resource Rents** | –3.223524 (0.0284**) | - | –3.181917 (0.0311**) | - |
| **Institutional Quality** | –2.352458 (0.1632) | –5.430199 (0.0001***) | –2.426785 (0.1432) | –5.435691 (0.0001***) |

*Note: ***, **,* and ** shows significance at 99%, 95%, and 90% confidence interval.*

Table 1 shows two important features regarding the univariate characteristics of variables used in this study. First, all variables followed different orders of integration: I(1) and I(0). Secondly, all proposed dependent variables were integrated of order one. These two characteristics of variables allowed us to apply ARDL, as these characteristics were also important prerequisites. The other prerequisite for ARDL was the existence of co-integration between I(0) and I(1). With these results, it could be assumed that for all equations, there was at least one short or long-run cointegrating relationship between I(0) and I(1) variables. Since all preconditions to apply the ARDL were fulfilled, that allowed us to proceed towards regression results.

**Table 2: Co-integration Bound Test Results**

| Dependent Variable | F-Statistics | K |
|---|---|---|
| Institutional Quality | 3.88 | 3 |

Table 3 shows the results for the impact of resource rents on institutional quality measured by corruption. On the basis of AIC, the order of ARDL was selected. It appears that resource rents (% of GDP) induced corruption and caused a deterioration of institutional quality both in the short and long-run. With a 1% increase in the proportion of resource rents in Kuwait GDP, corruption increased 0.43% in long-run, which was significant at the 10% level. The short-run results showed that the current and first lag of the percentage of resource rents in GDP had significant impact on institutional quality by 0.43% and 0.23%, respectively (given a 1% increase in resource rents; both at the 10% level).

Human Capital, as measured through education, also had a significant impact on institutional quality in both the short and long-run. A 1% increase in HC reduced corruption by 0.68% in the long-run, while in the short-run, the current and lag of HC also reduced corruption by 0.68% and 0.44%, respectively. However, PGDP at the current level did not have a statistically significant influence on corruption, while the lag of PGDP was positive and significantly influenced corruption in the short-run. PGDP appeared positive but insignificant in the long-run.

The model was stable overall with a 0.26 error correction term. Further, to check the stability of the model, the cumulative sum control chart (CUSUM) and CUSUM of Squares tests were applied and both tests indicated that the model was stable (see Appendix: Figure A1 and A2).

**Table 3: Impact of Resource Rents on Institutional Quality (Corruption)**

| Variable | Coefficient | Prob. |
|---|---|---|
| **Short-Run Results** | | |
| Resource Rents | 0.428* | 0.072 |
| Resource Rents (–1) | 0.229* | 0.0912 |
| Human Capital | –0.678*** | 0.007 |
| Human Capital (–1) | –0.441* | 0.069 |
| Per capita GDP | 0.100 | 0.768 |
| Per capita GDP (–1) | 0.131** | 0.044 |
| CointEq (–1) | –0.266* | 0.055 |
| **Long-Run Results** | | |
| Resource Rents | 0.430* | 0.069 |
| Human Capital | –0.675*** | 0.007 |
| Per capita GDP | 0.648 | 0.647 |
| C | 12.999** | 0.030 |

*Note: ***, **, and * shows significance at 99%, 95%, and 90% confidence interval.*

## 3.3 Discussion

The model findings show a negative association between resource rents and institutional quality, indicating that the proportion of resource rents in GDP could have led to an increase in corruption in Kuwait. These findings are consistent with studies in other contexts, namely Okada and Samreth (2017), Antonakakis et al., (2017), Olayungbo and

Adediran (2017), Apergisa and Payne, (2014), Akpan and Chuku (2014), Dias and Tebaldi (2012), Anthonsen et al. (2012), Easterly and Levine (2003), and Ades and Di Tella (1999).

The results also suggest that human capital can remediate some of the damages to institutional quality caused by resource rents. These results are aligned with several studies that confirm that education encourages legal and anti-corruption behaviors and increases the tendency of practicing good citizenship (Faria et al., 2016; Tebaldi and Elmslie, 2013; Dias and Tebaldi, 2012; Coe et al., 2009; Oreopoulos and Salvanes, 2009; Cheung and Chan, 2008; Beets, 2005; Glaeser et al., 2004; Lederman et al., 2005).

The lack of relationship between PGDP and institutional quality is aligned with Busse and Gröning (2013). This result indicates that although Kuwait is highly dependent on resource rents (92% of export revenues) (OPEC, 2019), and the vast oil revenues are reflected on its PGDP, Kuwait is still lagging behind in translating this blessing into development and growth.

The results from the model suggest that rents from oil have damaged the quality of institutions in Kuwait. Rents appear to increase the level of corruption in the short and long-run. However, human capital appears to be capable of mitigating this effect. Thus, as Kuwait increases its oil rents, its government must be mindful of how this could impact institutional quality. One policy to mitigate this impact would be to invest more in education**.** The model here indicates the level of investment required to offset the negative impacts of resource rents on institutional quality, as the results reveal that a 1% increase in human capital completely offsets the institutional quality damage caused by a 1% increase in resource rents in the long-run. Thus, the critical question that has arisen is how much does it cost to increase human capital by 1% and is it efficient to do this? This question must be further examined.

It should be noted that there could be other explanations of the phenomena under examination. The effects that were detected could be caused by the semi-democratic political system in Kuwait, which may foster corruption, relative to other systems of government (Collier and Hoeffler, 2009; Montinola and Jackman, 2002). As the political system is divided between an appointed government and elected parliament, it is less accountable and less representative, and thus provides more loopholes for rent-seeking activities and misallocation of natural resources (Andersen and Aslaksen 2008). Moreover, resource rents are linked to rent-seeking activities to obtain financial gains and personal benefits by officials (Busse and Gröning, 2013). In this case, it would be the political system itself that is creating the conditions for corruption. Exploration of this could be fruitful grounds for future study.

The outcomes of this study must be seen in light of some limitations concerning the time frame of the data, which was limited to 30 years (1984–2014) which represented the full extent of publicly available data. Although the data were adequate to show reliable results under the ARDL approach, more data would have been desirable. There is abundant room for applying the model developed on other Gulf Countries as a way to confirm its generalizability, which is an essential element in any research methodology, as well as to improve the applicability of the findings to the other Gulf Countries of Saudi Arabia, Qatar, and the United Arab Emirates.

## 4. Conclusion

This study analyzed the impact of non-renewable energy resource rents on institutional quality in Kuwait and the possible mitigating effect of human capital on institutional quality. The results indicate that an increase in resource rents decreases the institutional quality both in the short and long-run. However, human capital increases the level of institutional quality in the short and long-run.

Since the study indicates that human capital could offset the damage to institutional quality from natural resource wealth, the results recommend that authorities in Kuwait should give more prominence and attention to the development of human capital. Accordingly, skill-based education could be a key element in any diversification strategy.

It is worth remembering that there is no consensus in the literature over the link between institutions and the resource curse, and many suggest the link is different for each country (Brunnschweiler and Bulte, 2008; Bulte et al., 2005). This paper has added to this body of work by examining the conditions of Kuwait and its particular circumstances

## References

Acemoglu, D., Johnson, S. & Robinson, J. A. (2001). The colonial origins of comparative development: an empirical investigation, *American Economic Review*, 91 (5), pp. 1369-1401. DOI:10.3386/w7771

Acemoglu, D., Johnson, S. & Robinson, J. A. (2002). Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution, *Quarterly Journal of Economics,* 117 (4), pp. 1231-1294. DOI: 10.3386/w8460

Acemoglu, D., Johnson, S., & Robinson J. (2005). The rise of Europe: Atlantic trade, institutional change, and economic growth, *American Economic Review*, 95 (2), pp. 546-579. DOI: 10.3386/w9378

Acemoglu, D. & Robinson, J. (2010). The Role of Institutions in Growth and Development, *Review of Economics and Institutions,*1(2), pp. 1-33. DOI:10.5202/rei.v1i2.14

Acemoglu, D., Gallego, F. & Robinson, J. (2014). Institutions, human capital and development, *Annual Review of Economics,* 6 (2014), pp. 875-912. DOI: 10.1146/annurev-economics-080213-041119

Acevedo, S. (2008). Measuring the Impact of Human Capital on the Economic Growth of South Korea, *The Journal of the Korean Economy*, 9(1), pp. 113-139. Available at: file:///C:/Users/raalj/AppData/Local/Packages/Microsoft.MicrosoftEdge_8wekyb3d8bbwe/TempState/Downloads/Measuring_the_Impact_of_Human_Capital_on_the_Econo%20(1).pdf. (Accessed: 22 September 2017).

Ades, A.; Di Tella, R. (1999). Rents, Competition, and Corruption, *American Economic Review*, 89(4), pp. 982–993. DOI: 10.1257/aer.89.4.982

Ahmed, K., Mahalik, M.K, and Shahbaz, M. (2016). Dynamics between economic growth, labor, capital and natural resource abundance in Iran: an application of the combined cointegration approach, *Resources Policy*, 49(C), pp. 213-221. DOI: 10.1016/j.resourpol.2016.06.005

Aidt, T., Dutta, J. & Sena, V. (2008). Governance Regimes, Corruption and Growth: Theory and Evidence, *Journal of Comparative Economics*, 36(2), pp. 195-220. DOI: 10.1016/j.jce.2007.11.004

Akinlo, A. E. (2012). How Important is Oil in Nigeria's Economic Growth?, *Journal of Sustainable Development*, 5 (4), pp. 165 – 179. DOI:10.5539/jsd.v5n4p165.

Akpan, G. E. and Chuku, C. (2014) 'Natural Resources, Human Capital and Economic Development in Nigeria: Tracing the Linkages', *Journal of Economics and Sustainable Development,* 5(21), pp. 40-51. Available at: https://pdfs.semanticscholar.org/7633/561fd605c9c9e4e4e636ba42f276bb6c5913.pdf (Accessed: 2 November 2017).

Alesina, A., Baqir, R. & Easterly, W. (1999). Public goods and ethnic divisions, *Quarterly Journal of Economics*, Vol. 114, pp. 1243-1284. DOI: 10.1162/003355399556269

Alexeev, M. & Conrad, R. (2009). The Elusive Curse of Oil, *The Review of Economics and Statistics*, 91(3), pp. 586-598. DOI:10.1162/rest.91.3.586

Andersen, J. J. & Aslaksen, S. (2008). Constitutions and the resource curse, *Journal of Development Economics,* 87(2), pp. 227-246. DOI: 10.1016/j.jdeveco.2007.12.005

Anthonsen, M., Löfgren, A., Nilsson, K. & Westerlund, J. (2012). Effects of rent dependency on quality of government, *Economics of Governance,* 13(2), pp. 145–168. DOI: 10.1007/s10101-011-0105-3

Antonakakis, N., Cunado, J., Filis, G., & Gracia, F. P. D. (2017). Oil dependence, quality of political institutions and economic growth: A panel VAR approach, *Resources Policy*, 53, pp.147-163. DOI: 10.1016/j.resourpol.2017.06.005

Apergis, N. & Payne, J. (2014), The oil curse, institutional quality, and growth in MENA countries: Evidence from time-varying co-integration, *Energy Economics*, 46 (C), pp. 1-9. DOI: 10.1016/j.eneco.2014.08.026

Arezki, R. & van der Ploeg, F. (2007). *Can the Natural Resource Curse Be Turned into a Blessing? The Role of Trade Policies and Institutions*. IMF Working Papers No. 7, 1-34. DOI: 10.5089/9781451866193.001

Arezki, R. & van der Ploeg, F. (2011). Do Natural Resources Depress Income Per Capita?, *Review of Development Economics*, 15 (3), pp. 504-521. DOI: 10.1111/j.1467-9361.2011.00623.x

Aron, J. (2000). Growth and Institutions: A Review of the Evidence, *The World Bank Research Observer,* 15(1), pp. 99-135. DOI: 10.1093/wbro/15.1.99

Asekunowo, V.O., Olaiya, S.A. (2012). Crude oil revenue and economic development in Nigeria (1974–2008), *OPEC Energy Review*. 36(2), pp. 138–169. DOI: 10.1111/j.1753-0237.2011.00205.x

Auty R. (1993). *Sustaining development in mineral economies: The Resource Curse Thesis.* England and Wales, London: Routledge.

Auty, R. M. (2001). *Resource abundance and economic development.* London: Oxford University Press.

Badeeb, R. A. & Lean, H. H. (2017). Natural Resources and Productivity: Can Banking Development Mitigate the Curse?, *Economies,* 5(2), pp. 1-14. DOI:10.3390/economies5020011

Baland, J. M. & Francois, P. (2000). Rent-seeking and Resource Booms, *Journal of Development Economics*, 61(2), pp. 527-542. DOI: 10.1016/S0304-3878(00)00067-5

Barro, R. J. (1991). Economic Growth in a Cross Section of Countries. *The Quarterly Journal of Economics*, 106 (2), pp. 407-443. DOI: 10.2307/2937943

Barro, R. J. & Sala-i-Martin, X. (1997). Technological Diffusion, Convergence, and Growth', *Journal of Economic Growth*, 2(1), pp. 1-26. Available at: Handle: *RePEc:kap:jecgro:v:2:y:1997:i:1:p:1-26* (Accessed: 2 December 2017).

Barro, R. J. & Lee, JW. (2013). A new data set of educational attainment in the world, 1950-2010, *Journal of Development Economics*, 104(C), pp. 184–198. DOI: 10.1016/j.jdeveco.2012.10.001

Becker, S., Boeckh, K., Hainz, C., & Woessmann, L. (2016). The empire is dead, long live the empire! Long-run persistence of trust and corruption in the bureaucracy, The Economic Journal, 126(590), pp. 40-74. DOI:10.1111/ecoj.12220

Beets, S. D. (2005). Understanding the Demand-Side Issues of International Corruption, *Journal of Business Ethics*, 57(1), pp. 65-81. DOI: 10.1007/s10551-004-3824-3

Beland, L. & Tiagi, R. (2009). *Economic freedom and the resource curse: An empirical analysis'*, Available at: https://www.fraserinstitute.org/sites/default/files/EconomicFreedomandResourceCurse_.pdf (Accessed: 3 November 2018).

Besley, T. & Persson, T. (2014). Why Do Developing Countries Tax So Little?, *Journal of Economic Perspectives*, 28(4), pp. 99-120. DOI: 10.1257/jep.28.4.99

Bhattacharyya, S. & Hodler,R. (2014). Do natural resource revenues hinder financial development? The role of political institutions, *World Development*, 57, pp. 101-113. DOI: 10.1016/j.worlddev.2013.12.003

Boix, C. (2003). *Democracy and Redistribution*. Cambridge: Cambridge University Press.

Boschini, A. D., Pettersson, J., & Roine, J. (2007). Resource Curse or Not: A Question of Appropriability, *The Scandinavian Journal of Economics*, 109 (3), pp. 593–617. DOI: 10.1111/j.1467-9442.2007.00509.x

Boschini, A. D., Pettersson, J., & Roine, J. (2013). The Resource Curse and its Potential Reversal, *World Development, Elsevier,* 43(C), pp. 19-41. DOI: 10.1016/j.worlddev.2012.10.007

Bravo-Ortega, C. & De Gregorio, J. (2005). *The Relative Richness of the Poor? Natural Resources, Human Capital, and Economic Growth*. World Bank Policy Research Working Paper No. 3484. DOI: 10.2139/ssrn.648006 ·

Brunnschweiler, C. (2008). Cursing the Blessings? Natural Resource Abundance, Institutions, and Economic Growth, *World Development,* 36(3), pp. 399-419. DOI: 10.1016/j.worlddev.2007.03.004

Brunnschweiler, C. & Bulte, E. (2008). The resource curse revisited and revised: A tale of paradoxes and red herrings. *Journal of Environmental Economics and Management,* 55(3), 248-264. DOI: 10.1016/j.jeem.2007.08.004

Bulte, E., Damania, R. & Deacon, R. T. (2005). Resource Intensity, Institutions, and Development, *World Development,* 33 (7), pp. 1029-1044. DOI: 10.1016/j.worlddev.2005.04.004

Busse, M. & Gröning, S. (2013). The resource curse revisited: Governance and natural resources, *Public Choice,* 154(1–2), pp 1–20. DOI 10.1007/s11127-011-9804-0

Cabrales, A. & Hauk, E. (2011). The Quality of Political Institutions and the Curse of Natural Resources, *The Economic Journal*, 121(551), pp. 58 – 88. DOI: 10.1111/j.1468-0297.2010.02390.x

Caselli, F. & Cunningham, T. E. (2009). Leader Behaviour and the Natural Resource Curse, *Oxford Economic Papers,* 61(4), pp. 628-650. DOI: 10.1093/oep/gpp023

Castello-Climent, A. (2008). On the distribution of education and democracy, *Journal of Development Economics*, 87 (2), pp. 179-190. DOI: 10.1016/j.jdeveco.2007.10.006

Cavalcanti, T., Mohaddes, K., & Raissi, M. (2011). Growth, Development and Natural Resources: New Evidence Using a Heterogeneous Panel Analysis, *The Quarterly Review of Economics and Finance,* 51(4), pp. 305-318. DOI:10.1016/j.qref.2011.07.007

Cheung, H. Y. & Chan, A. W.H. (2008). Corruption Across Countries; Impacts form Education and Cultural Dimensions, *The Social Science Journal,* 45(2): pp. 223-239. DOI: 10.1016/j.soscij.2008.03.002

Chong, A. & Calderon, C. (2000). Causality and Feedback between Institutional Measures and Economic Growth, *Economics and Politics,* 12(1), pp. 69-81. DOI:10.1111/1468-0343.00069

Coe, D.T., Helpman, E. & Hoffmaister, A.W. (2009). International R&D spill overs and institutions, *European Economic Review*, 53 (7), pp. 723-741. DOI:10.1016/j.euroecorev.2009.02.005

Collier, P. & Hoeffler, A. (2009). Testing the neocon agenda: democracy in resource-rich societies, *European Economic Review,* 53(3), pp. 293-308. DOI: 10.1016/j.euroecorev.2008.05.006

Costa, H. & Santos, E. (2013). Institutional analysis and the resource curse in developing countries, *Energy Policy,* 63(C), pp. 788-795. DOI: 10.1016/j.enpol.2013.08.060

Costantini, V. & Monni, S. (2008). Environment, human development and economic growth, *Ecological Economics*, 64(4), pp. 867-880. DOI: 10.1016/j.ecolecon.2007.05.011

Dalgaard, C. & Olsson, O. (2008). Windfall gains, political economy and economic development, *Journal of African Economies*, 17(233), pp. 72-109. DOI: 10.1093/jae/ejm033}

Davis, G. (1995). Learning to love the Dutch disease: Evidence from the Mineral Economies, *World Development*, 23(10), pp.1765-79. DOI: 10.1016/0305-750X(95)00071-J

Dias, J. & Tebaldi, E. (2012). Institutions, human capital, and growth: The institutional mechanism, *Structural Change and Economic Dynamics,* 23(3), pp. 300–312. DOI: 10.1016/j.strueco.2012.04.003

Douglas, S. & Walker, A. (2017). Coal Mining and The Resource Curse In The Eastern United States, *Journal of Regional Science,* 57(4), pp. 568-590. DOI: 10.2139/ssrn.2385560

Easterly, W. & Levine, R. (2003). Tropics, germs, and crops: how endowments influence economic development, *Journal of Monetary Economics*, 50(1), pp. 3-39. DOI:10.1016/S0304-3932(02)00200-3

Elbadawi, I. A. & Soto, R. (2015). Resource rents, institutions, and violent civil conflicts, *Defence and Peace Economics*, 26(1), pp. 89-113. DOI: 10.1080/10242694.2013.848579

Engerman, S. L. & Sokoloff, K. L. (2002). Factor Endowments, Inequality, and Paths of Development among New World Economies, *Economia*, 3(1), pp. 41-88. DOI: 10.1353/eco.2002.0013

Eregha, P.B., & Mesagan, E. (2016). Oil resource abundance, institutions and growth: Evidence from oil producing African countries, *Journal of Policy Modeling,* 38(3), pp. 603-619. DOI: 10.1016/j.jpolmod.2016.03.013

Farhadi, M, Islam, Md. R., & and Moslehi, S. (2015). Economic Freedom and Productivity Growth in Resource-rich Economies, *World Development*, 72, pp. 109-126. DOI: 10.1016/j.worlddev.2015.02.014.

Faria H., Montesinos-Yufa, H. M., Morales, D. R. & Navarro, C. E. (2016). Unbundling the roles of human capital and institutions in economic development, *European Journal of Political Economy,* 45, pp 108-128. DOI:10.1016/j.ejpoleco.2016.08.001

Faruq, H. & Taylor, A. (2011). Quality of Education, Economic Performance and Institutional Environment', *International Advances in Economic Research,* 17(2), pp. 224-235. DOI:10.1007/s11294-011-9293-4

Feenstra, R. C., Robert, I. & Marcel, P. T. (2015). The Next Generation of the Penn World Table, *American Economic Review*, 105(10), pp. 3150-3182. DOI: 10.1257/aer.20130954

Frankel, J. (2012). The natural resource curse: A survey of diagnoses and some prescriptions', HKS Faculty Research Working Paper Series RWP12-014, John F. Kennedy School of Government, Harvard University. Available at: http://nrs.harvard.edu/urn-3:HUL.InstRepos:8694932 (Accessed: 22 February 2017).

Galor O., Moav, O., & Vollrath D. (2009). Inequality in landownership, the emergence of human-capital promoting institutions, and the great divergence, *Review of Economic Studies,* 76(1), pp. 143-179. DOI: 10.1111/j.1467-937X.2008.00506.x

Glaeser, E. L, La Porta, R., Lopez-de-silanes, F. & Shleifer, A. (2004). Do institutions cause growth?, *Journal of Economic Growth*, 9 (1), pp. 271-303. DOI: 10.2139/ssrn.556370

Guriev, S. M., Plekhanov, A., & Sonin, K. (2009). *Development based on commodity revenues,* European Bank for Reconstruction and Development Working Paper No. 108. Available at: https://www.ebrd.com/downloads/research/economics/workingpapers/wp0108.pdf (Accessed: 21 September 2017).

Gylfason, T., Herbertsson, T., & Zoega, G. (1999). A mixed blessing: Natural resources and economic growth, *Macroeconomic Dynamics*, 3(2), pp. 204-225. DOI: 10.1017/S1365100599011049

Gylfason, T. (2001). Natural resources, education, and economic development, *European Economic Review*, 45 (4–6), pp. 847-859. DOI: 10.1016/S0014-2921(01)00127-1

Gylfason, T. (2003). Nature, power and growth, *Scottish Journal of Political Economy,* 48 (5), pp. 558-588. DOI: 10.1111/1467-9485.00215

Gylfason, T., (2003). Resources, Agriculture, and Economic Growth in Economies in Transition, *Kyklos*, 53(4), pp. 545-579. DOI:10.1111/1467-6435.00133

Haapanen, L. & Tapio, P. (2016). Economic growth as phenomenon, institution and ideology: a qualitative content analysis of the 21st century growth critique, *Journal of Cleaner Production*, 112, pp. 3492-3503. DOI: 10.1016/j.jclepro.2015.10.024

Haber, S., & Menaldo, V. (2011). Do natural resources fuel authoritarianism? A reappraisal of the resource curse, *The American political science Review,* 105(1), pp. 1-26. Available at: https://www.jstor.org/stable/41480824 (Accessed: 10 November 2018).

Hall, R. E. & Jones, C. I. (1999) 'Why do Some Countries Produce So Much More Output Per Worker than Others?', *The Quarterly Journal of Economics*,114(1), pp. 83-116. Available at: http://www.jstor.org/stable/2586948 (Accessed: 10 November 2018).

Hanushek, E. A. & Woessmann, L. (2007). *The Role of Education Quality for Economic Growth',* World Bank Policy Research Working Paper No. 4122. Available at SSRN: https://ssrn.com/abstract=960379 (Accessed on 12 February 2019).

Hodgson, G. M. (2006). What Are Institutions?, *Journal of Economic Issues,* 40(1). DOI: 10.1080/00213624.2006.11506879

Hvidt, M. (2013). *Economic diversification in GCC countries: Past record and future trends*, London School of Economics and Political Science. Available at: http://www.lse.ac.uk/IDEAS/programmes/kuwait/documents/economic-diversification-in-the-gcc-countries.pdf (Accessed: 21 February 2019)

International Country Risk Guide, ICRG (2017) 'Country Data Online', Available at: https://epub.prsgroup.com/the-countrydata-gateway/ (Accessed: 14 October 2018).

Isham, J., Woolcock, M., Pritchett, L. and Busby, G. (2005). The Varieties of Resource Experience: Natural Resource Export Structures and the Political Economy of Economic Growth, *The World Bank Economic Review*, 19 (2), pp. 141–174. Available at: http://documents.worldbank.org/curated/en/184571468149698798/Varieties-of-resource-experience-natural-resource-export-structures-and-the-political-economy-of-economic-growth (Accessed: 2 October 2018).

Islam, R. and Montenegro, C. E. (2002) '*What determines the quality of institutions?'*, Policy Research Working Paper No. 2764. Washington, DC: World Bank. Available at: http://documents.worldbank.org/curated/en/416091468766754963/What-determines-the-quality-of-institutions (Accessed: 20 December 2017).

Ji, K.; Magnus, J.; Wang, W. (2014). Natural Resources, Institutional Quality, and Economic Growth in China, *Environmental and Resource Economics,* 57 (3), pp. 323–343. DOI: 10.1007/s10640-013-9673-8

Karl, T. L. (1997). *The Paradox of Plenty: Oil Booms and Petro States.* Berkeley: University of California Press.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009). *Governance matters VIII: Governance indicators for 1996–2008*. World Bank Policy Research Working Paper No. 4978. DOI:10.1596/1813-9450-4978

Kim, D. & Lin, S. C. (2017). Human capital and natural resource dependence, *Structural Change and Economic Dynamics,* 40, pp. 92-102. DOI: 10.1016/j.strueco.2017.01.002

Knack, S. (1999). *Democracy, Governance and Growth*. United States: The University of Michigan Press.

Knack, S. & Keefer, P. (1995). Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures, *Economics and Politics,*7(3), pp 207-227. DOI:10.1111/j.1468-0343.1995.tb00111.x.

Knack, S. & Keefer P. (1997). Does Social Capital Have an Economic Payoff? A Cross-Country Investigation. *The Quarterly Journal of Economics*, 112(4), pp. 1251–1288. DOI: 10.1162/003355300555475

Kolstad, I. & Wiig, A. (2009). It's the rents, stupid! The political economy of the resource curse, *Energy Policy,* 37, pp. 5317–5325. DOI: 10.1016/j.enpol.2009.07.055

Krugman, P. (1987). The narrow moving band, the Dutch disease, and the competitive consequences of Mrs. Thatcher: Notes on trade in the presence of dynamic scale economies, *Journal of Development Economics*, 27(1-2), pp. 41-55. DOI: 10.1016/0304-3878(87)90005-8

Kurtz, M & Brooks, S. (2011). Conditioning the "Resource Curse": Globalization, Human Capital, and Growth in Oil-Rich Nations. *Comparative Political Studies*, 44 (6), 747-770. DOI:10.1177/0010414011401215

Lane, P. R., & Tornell, A. (1996). Power, Growth and the Voracity Effect, *Journal of Economic Growth,* 1(2), pp. 213-241. DOI: 10.1007/BF00138863

Lau, L. J., Jamison, D. T. and Louat, F. F. (1991). *Education and productivity in developing countries: an aggregate production function approach*, Policy, Research, and External Affairs Working Papers No. 612, World Development Report. Available at: http://documents.worldbank.org/curated/en/720681468739788036/Education-and-productivity-in-developing-countries-an-aggregate-production-function-approach (Accessed: 13 September 2018).

Leamer, E., Schott, P., Maul, H. & Rodriguez, S. (1999). Does Natural Resource Abundance Increase Latin American Income Inequality, *Journal of Development Economics,* 59(1), pp. 3-42. DOI: 10.1016/S0304-3878(99)00004-8

Lederman, D., Loayza, N. V. & Soares, R. R. (2005). Accountability and Corruption: Political Institutions Matter', *Economics and Politics,* 17(1), pp. 1–35. DOI: 10.1111/j.1468-0343.2005.00145.x

Lehne, J., Mo, J. & Plekhanov, A. (2014). *What determines the quality of economic institutions? Cross-country evidence,* EBRD Working Paper No. 171. Available at: http://nrs.harvard.edu/urn-3:HUL.InstRepos:8694932 (Accessed: 20 February 2017).

Leite, C. and Weidmann, J. (1999) '*Does mother nature corrupt? Natural resources, corruption and economic growth.* International Monetary Fund, Working Paper No 99/85, Available at: https://ssrn.com/abstract=259928 (Accessed: 2 September 2018).

Lipset, S. M. (1960). *Political man: The social basis of modern politics.* New York: Doubleday.

Lucas, R. (1988). On the mechanics of economic development, *Journal of Monetary Economics,* 22(1), pp. 3-42. DOI:10.1016/0304-3932(88)90168-7

Mavrotas, G., Murshed, SM. & Torres, S. (2011). Natural resource dependence and economic performance in the 1970–2000 period. *Review of Development Economics,* 15(1), pp. 124–138. DOI: 10.1111/j.1467-9361.2010.00597.x.

Mehlum, H., Moene, K., & Torvik, R. (2006). Cursed by Resources or Institutions?, *World Economy*, 29 (8), pp. 1117–1131. DOI: 10.1111/j.1467-9701.2006.00808.x

Montinola, G. R. & Jackman, R. W. (2002). Sources of Corruption: A Cross-Country Study, *British Journal of Political Science,*32(01), pp. 147 – 170. DOI: 10.1017/S0007123402000066

Moradbeigi, M. & Law, S.H. (2017). The role of financial development in the oil-growth nexus, *Resources Policy,* 53(C), pp. 164-172. DOI: 10.1016/j.resourpol.2017.06.016

North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.

North, D. (1994). Economic performance through time, *The American Economic Review*, 84(3), pp. 359–368. Available at: ttps://www.jstor.org/stable/2118057

Okada, K. & Samreth, S. (2017). Corruption and natural resource rents: evidence from quantile regression, *Applied Economics Letters*, 24(20), pp. 1490-1493, DOI: 10.1080/13504851.2017.1287849

Olayungbo, D. O. & Adediran, K.A. (2017). Effects of Oil Revenue and Institutional Quality on Economic Growth with an ARDL Approach, *Energy and Policy Research,* 4(1), pp. 44-54. DOI: 10.1080/23815639.2017.1307146.

Ologunla, S. E., Kareem, R. O. & Raheem, K. A. (2014). Institutions and the Resource Curse in Nigeria, *Journal of Sustainable Development Studies*, 7 (1), pp. 36 – 51. Available at: infinitypress.info/index.php/jsds/article/download/805/403

Olson, M. (2000). *Power and Prosperity: Outgrowing Communist and Capitalist Dictatorships*, Oxford: Oxford University Press.

Omodadepo, A. & Akanni, P. (2013). Oil Wealth; Meat in Norway, Poison in Nigeria: An Analysis of Human Capital as a Transmission Channel of Resource Curse, *Journal of World Economic Research*, 2(3), pp. 39 – 44. DOI: 10.11648/j.jwer.20130203.12

Organization of Petroleum Exporting Countries, OPEC (2019) *'Kuwait'.* Available at: https://www.opec.org/opec_web/en/about_us/165.htm. (Accessed: 14 June 2019).

Oreopoulos, P. and Salvanes, K. G. (2009) '*How Large are Returns to Schooling? Hint: Money Isn't Everything', NBER Working Paper* No 15339. Available at: http://www.nber.org/papers/w15339 (Accessed: 4 October 2018).

Oskenbayev, Y., Yilmaz, M. and Abdulla, K. (2013). Resource concentration, institutional quality and the natural resource curse, *Economic Systems*, 37(2), pp. 254–270. DOI:10.1016/j.ecosys.2012.11.001

Papyrakis, E. & Gerlagh, R. (2004). The resource curse hypothesis and its transmission channels, *Journal of Comparative Economics*, 32 (1), pp. 181–193. DOI: 10.1016/j.jce.2003.11.002

Perera, L. D. & Lee, G. H. (2013). Have Economic Growth and Institutional Quality Contributed to Poverty and Inequality Reduction in Asia?, *Journal of Asian Economics*, August (27), pp. 71-86. DOI: 10.1016/j.asieco.2013.06.002.

Pesaran, M. H. (2006). Estimation and Inference in Large Heterogeneous Panels with a Multifactor Error Structure, *Econometrica*, 74(4), pp. 967-1012. DOI: 10.1111/j.1468-0262.2006.00692.x

Pesaran, M. H., Shin, Y. & Smith, R. J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships, *Journal of Applied Econometrics*, 16(3), pp. 289–326. DOI:10.1002/jae.616.

Poelhekke, S. & Van der Ploeg, F. (2010). Do Natural Resources Attract FDI? Evidence from Non-Stationary Sector Level Data, *SSRN Electronic Journal.* DOI: 10.2139/ssrn.1950092

Prebisch, R (1950), *The Economic Development of Latin America and Its Principal Problems.* New York: United Nations.

Psacharopoulos, G. (1994). Returns to investment in education: A global update, *World Development*, 22(9), pp. 13225-1343. DOI: 10.1016/0305-750X(94)90007-8

Robinson, J., Acemoglu, D. and Johnson, S. (2005). Institutions as a Fundamental Cause of Long-Run Growth, *Handbook of Economic Growth*, 1A, pp. 386-472. DOI: 10.1016/S1574-0684(05)01006-3

Robinson, J., Torvik, R., & Verdier, T. (2006). Political foundations of the Resource Curse, *Journal of Development Economics,* 79(2), pp. 447– 468. DOI: 10.1016/j.jdeveco.2006.01.008

Rodriguez, F., & Sachs, J. D. (1999). Why do resource-abundant economies grow more slowly?, *Journal of Economic Growth*, 4(3), pp. 277-303. DOI: 10.1023/A:1009876618968

Rodrik, D., Subramanian, A. & Trebbi, F. (2004). Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development, *Journal of Economic Growth,* 9(2), pp. 131-165. DOI: 10.1023/B:JOEG.0000031425.72248.85

Romer, P. M. (1986). Increasing Returns and Long-Run Growth, *Journal of Political Economy,* 94(5), pp.1002-1037. Available at: https://www.jstor.org/stable/1833190

Romer, P. M. (1990). Endogenous Technological Change, *Journal of Political Economy,* 98(5), pp. 71–102. DOI: 10.3386/w3210

Ross, M. (1999). The political economy of the resource curse, *World Politics*, 51(2), pp. 297-322. DOI: 10.1017/S0043887100008200

Ross, M. (2015) 'What have we learned about the resource curse?' *Annual Review of Political Science,* 18(1), pp. 239-259. DOI: 10.1146/annurev-polisci-052213-040359

Rosser, A. (2006) '*The Political Economy of the Resource Curse: A Literature Survey.* Institute of Development, Working Paper No 268, 1–36. Brighton: IDS. Available at: http://opendocs.ids.ac.uk/opendocs/handle/123456789/4061 (Accessed: 13 December 2017).

Sachs, J. D. (2007). How to handle the macroeconomics of oil wealth. In M. Humphreys, J. D. Sachs &J. E. Stiglitz (Eds.), *Escaping the resource curse.* New York: Columbia University Press.

Sala-i-Martin, X. & Subramanian, A. (2013). Addressing the natural resource curse: an illustration from Nigeria, *Journal of African Economies,* 22 (4), pp. 570–615. DOI: 10.1093/jae/ejs033

Sandbu, M.E. (2006). Natural wealth accounts: a proposal for alleviating the natural resource curse, *World Development,* 34 (7), pp. 1153-1170. DOI: 10.1016/j.worlddev.2005.11.014

Sarmidi, T., Hook Law, S., & Jafari, Y. (2014). Resource Curse: New Evidence on the Role of Institutions, *International Economic Journal*, 28 (1), pp. 191-206. DOI: 10.1080/10168737.2013.787110

Seck, A. (2011). International technology diffusion and economic growth: explaining the spill over benefits to developing countries, *Structural Change and Economic Dynamics,* 23(4), pp. 437-451. DOI:10.1016/j.strueco.2011.01.003.

Singer, H. (1950). The Distribution of Gains Between Investing and Borrowing Countries, *American Economic Review,* 40 (2), pp. 473-485. DOI: 10.1007/978-1-349-04228-9_3

Sovacool, B.K. (2010). The political economy of oil and gas in Southeast Asia: heading towards the natural resource curse?, *The Pacific Review*, 23(2). pp. 225–259. DOI: 10.1080/09512741003624484

Stijns, J.P. (2006). Natural resource abundance and human capital accumulation. *World Development*, 34 (6), pp. 1060-1083. DOI:10.1016/j.worlddev.2005.11.005

Stijns, Jean-Philippe (2005). Natural Resource Abundance and Economic Growth Revisited, *Resources Policy,* 30(2), pp. 107-130. DOI: 10.1016/j.resourpol.2005.05.001
Sun, Hua-Ping, Sun, Wei-Feng, Geng, Yong & Kong, Yu-Sheng (2018). Natural resource dependence, public education investment, and human capital accumulation, *Petroleum Science*, 15(1), pp.657–665. DOI:10.1007/s12182-018-0235-0.

Suslova, E. & Volchkova, N. (2012). Human Capital, Industrial Growth and Resource Curse, *The Economic Journal of the Higher School of Economics,* 12(2), pp. 217-238. DOI:10.2139/ssrn.1023523

Tebaldi, E. & Elmslie, B. (2013). Does institutional quality impact innovation? Evidence from cross-country patent grant data, *Applied Economics*, 45 (7), pp. 887-900. DOI: 10.1080/00036846.2011.613777

Torres, N., Afonso, Ó. & Soares, I. (2012). Oil abundance and economic growth-a panel data analysis, *The Energy Journal*, 33 (2), pp. 119–148. DOI: /10.5547/01956574.33.2.6

Torvik, R. (2009). Why do some Resource-Abundant Countries Succeed while Others do not?, *Oxford Review of Economic Policy*, 25(2), pp. 241 – 256. DOI: 10.1093/oxrep/grp015

Treisman, D. (2000). The causes of corruption: a cross-national study. *Journal of Public Economics*, 76(3), pp. 399-457. DOI: 10.1016/S0047-2727(99)00092-4

Welsch, H. (2008). Resource Dependence, Knowledge Creation, and Growth: Revisiting the Natural Resource Curse, *Journal of Economic Development*, 33(1), pp. 45–70. Available at: http://www.jed.or.kr/full-text/33-1/3.pdf (Accessed: 4 October 2017).

Woolcock, M., Pritchett, L. & Isham, J. (2001). The Social Foundations of Poor Economic Growth in Resource-Rich Countries, in Auty, R. (ed.) *Resource Abundance and Economic Development.* Oxford, UK: Oxford University Press, pp 76-92.

World Bank (2017). *World Development Indicators, (WDI)*. Available at: www.data.worldbank.org (Accessed: 4 December 2017).

Yang, B. (2010). Resource curse: the role of institutions versus policies, *Applied Economics Letters,* 17 (1), pp. 61–66. DOI: 10.1080/13504850701719736

# Appendix: CUSUM and CUSUM of Squares tests

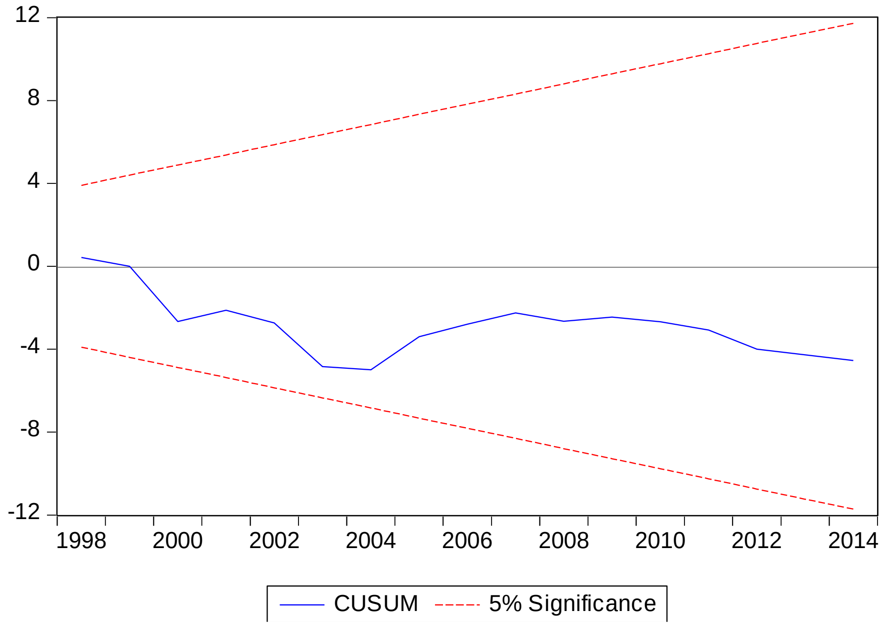



**Figure A1:** CUSUM Stability Test
Source: Author's own calculations

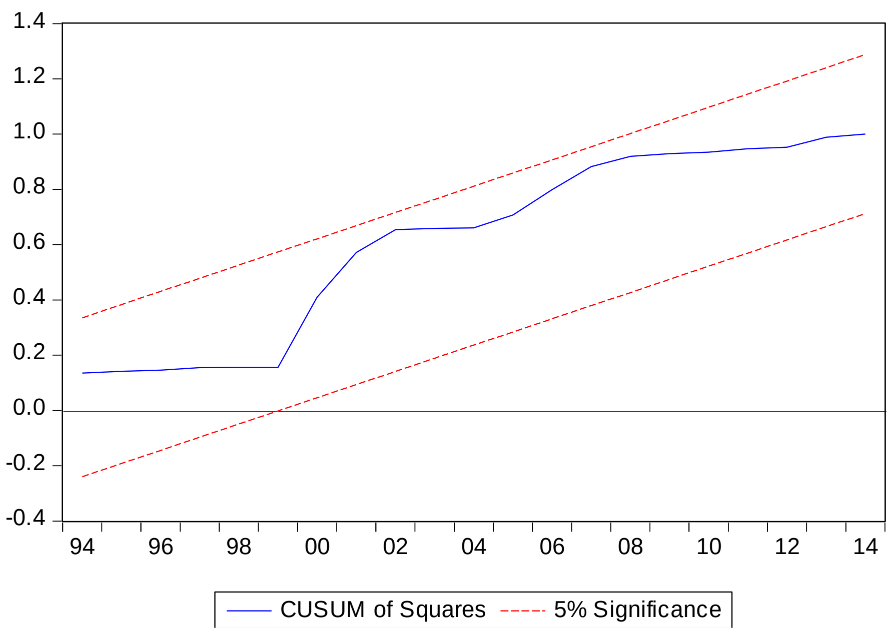



**Figure A2:** CUSUM of Squares Stability Test
Source: Author's own calculations

## APPENDIX G.

***The Third Article:*** The Manuscript has received an official acceptance for publication in *Resources*.

*Article*

# Impact of Natural Resource Rents and Institutional Quality on Human Capital: A Case Study of the United Arab Emirates

**Ruba Aljarallah**

School of Management, Cranfield University, Bedford MK43 0AL, UK; ruba.aljarallah@cranfield.ac.uk

Received: 13 June 2019; Accepted: 21 August 2019; Published: 28 August 2019

**Abstract:** For many years, the United Arab Emirates has been using its natural resource wealth to develop infrastructure and attain economic growth. Nevertheless, human capital theory stresses the importance of human capital to reach sustainability in the long-term. This study examines the impacts of natural resource rents and institutional quality on human capital by applying the cointegration and error correction model based on the autoregressive distributed lag (ARDL) approach. The study uses corruption and law and order as proxies for institutional quality. The results indicate that one percent increases in resource rents and corruption decrease the human capital by 0.16% and 0.14%, respectively, in the long-term. Moreover, in the short-term, the current corruption and lag of resource rents have significant negative impacts on human capital. However, law and order has a positive impact on human capital in both the short and long-term. Thus, this study suggests that there is an instant need to prioritize education to reach long-term sustainability.

**Keywords:** natural resource rents; human capital; corruption; law and order; United Arab Emirates

---

## 1. Introduction

The economic history of resource-rich countries shows varied evidence of how natural resources affect economic growth. These resources are considered as either an engine of growth or an obstacle to growth [1]. These two pieces of evidence prove and disprove the resource curse theory, respectively, as this theory is based on the argument that natural resources harm growth [2]. However, economic theory proposes that natural resources improve the production potential, thus boosting economic growth [3].

The mere existence of natural resources does not prompt economic stagnation, yet it causes certain distortions, which then act as transmission mechanisms that, in turn, disturb economic growth. Thus, these transmission mechanisms affect growth directly, while natural resources merely exert indirect effects via the transmission mechanisms, such as declines in human capital and government mismanagement [4]. Besides, the traditional view under a policy perspective focuses on the monetary aspects of development: the growth rate and level of gross domestic product per capita (per capita GDP) [5]. However, the interest in non-monetary outcomes has increased rapidly [6-10] which supports the need for a better understanding of how natural resources affect human development. After observing these two areas in the literature, we proposed this study to investigate the impact of natural resources on human capital along with per capita GDP, corruption, and law and order as control variables in one of the major petroleum-exporting countries.

Human capital represents the skills and knowledge that individuals build, maintain, and practice [11-12], and it is a necessary element for rapid economic growth and development across the globe, because it improves the quality of living conditions by increasing the efficiency of workers, fostering democracy, creating good governance, and enhancing equality [13-15]. A number of studies have observed the effect of human capital on economic performance, and the majority have found that human capital positively affects economic performance [16-20].

There has been an upsurge of interest regarding the relationship between natural resources and human capital, and a negative link between resource abundance and economic growth to deteriorating human capital in resource-rich countries has been traced [1,8-10],[21-22]. The principal argument that explains how rents from natural resources, as measured by income from oil, gas, and minerals, tend to deteriorate human capital is related to the false sense of security and overconfidence that natural resource rents deliver for both the government and the people. Consequently, this retards the incentive to invest in human capital and be locked in low skilled jobs, leading to low growth. According to [4], countries that consider natural resources as their most relevant asset are prone to neglect human capital development by allocating low attention and financial resources to it.

Despite these conclusions, the literature is deficient on how other important factors in a resource-rich economy could affect human capital, such as the institutional quality and per capita GDP. It is crucial to understand the complex dynamics of the resource curse from a different perspective, since natural resources should not be the only factor that ruins or enhances human capital in a resource-rich country. However, few studies have examined this scenario by looking at the direct and indirect links between natural resources and human development via institutional quality [23-26].

Based on this argument, our study questions whether institutional quality has any link to human capital as a clarification step to give a full picture of the relationships that may exist among the selected variables. It is observed that good institutional quality is essential to support human capital development [20], as an enhancement in human capital may not necessarily be linked to major improvements in growth if the country has weak institutional quality [27].

The present study constructs objectives based on different factors; since it has been agreed that human capital is essential for growth, the number of studies are limited in this field, and the resource curse has different "strains" according to national circumstances. So, the objective is to test whether there is evidence of the resource curse for human capital along with per capita GDP and institutional quality as control variables in one of the major petroleum exporting countries, the United Arab Emirates, which, to date, has not received attention in the literature.

To our knowledge, this is the first study to examine the short and long-term effects of natural resources on human capital in the United Arab Emirates (UAE). It is interesting for an international audience because an oil-rich country like the United Arab Emirates is a prime candidate for the undesirable effects of the resource curse and, as such, provides useful results for policymakers.

This paper develops as follows: Section 2 includes data and the research methodology, Section 3 includes the results and discussion, Section 4 concludes the study, and Section 5 discusses the limitations and future research.

## 2. Data and Research Methodology

### *2.1. Data and Variables Description*

This study takes the per capita GDP, resource rents, and institutional quality as independent variables and the human capital as a dependent variable. The descriptions and the rationale of choosing these variables are as follows:

Human capital (HC) is challenging to measure, but it is often regarded as the accumulation of education in a country [28]. Human capital theory explains how education is a significant source of human capital, which, in time, is an important component in the economic growth of any country [29]. The present study took the human capital index for the period of 1984–2014, based on the average number of schooling years and rate of return in terms of education from the Penn world table [30] version 9, as also used by [31].

The per capita GDP (PGDP) was used as an indicator, following several studies that considered PGDP as a proxy for the degree of development in a country [32-35]. There is a strong link between PGDP and human capital. High national income is used to allocate more resources to improve human capital and to support an institutional environment that encourages learning and schooling [36-37]. Data on PGDP from 1984–2014 were retrieved from the world development indicators (WDI) provided by the world bank (2017) for the period 1984–2014. PGDP is measured in US dollars and divided by the population of each country for the said period to get the per capita GDP; the population data were obtained from the world bank (2017). PGDP was also used by [38-39].

Natural resource rents (NRR) were detangled in this study. One point of view holds that resources are seen to discourage the society to invest on education and to obtain high skills because people can get jobs with less skills in resource-based sectors [4, 40]. The other point of view is that resource-rich countries have the capacity to invest and spend more on education to increase human capital. To estimate this phenomenon, the present study used resource rents (RR) as independent variable to check the impact of non-renewable natural resources on human capital. The total natural resource rents (% of GDP) data from 1984–2014 were taken from the world development indicators (WDI) provided by the world bank (2017). The natural resource rents was defined as the total percentage of GDP associated with sales of natural resources (World Bank, 2017) in accordance with [4, 22,41-46].

Institution Quality (IQ), in the form of corruption and weak law and order, hinders human capital development [47-49] This study used corruption (CRP) and law and order (LO) as proxies for institutional quality (IQ) following [34, 50-53], and data from 1984–2014 were taken from the international country risk guide (ICRG) by the PRS Group [54]. The CRP variable assesses the level of corruption within a political system and includes financial corruption, e.g., demands for special payments and bribes in connection with import and export licenses, exchange controls, tax assessments, excessive patronage, nepotism, or secret party funding [34, 55]. As stated by [51]. LO reflects "the degree to which the citizens of a country are willing to accept the established institutions to make and implement laws and adjudicate disputes". In ICRG, "law and order" has a scale from 0–6 and corruption is measured as "control of corruption" on a scale from 0–6. The measure of corruption was inverted to represent "corruption" in this paper, which is a similar approach to that taken by [42]. The descriptive statistics are given in Table 1.

**Table 1.** Descriptive statistics.

| | **Mean** | **Max.** | **Min.** |
|---|---|---|---|
| Per capita GDP ($) | 56,793 | 86,936 | 35,049 |
| Resource Rents | 19.77 | 32.58 | 9.04 |
| Corruption Index | 2.51 | 3.54 | 2.0 |
| Law and Order Index | 3.73 | 4.0 | 2.66 |
| Human Capital Index | 2.40 | 2.73 | 1.76 |

*2.2. Theoretical Model*

To determine whether resource rent growth is inclusive or exclusive, this study tested the impact of resource rents on human capital:

$$\mathrm{HC_t} = \theta_1 \mathrm{RR_t} + \theta_2 \mathrm{Crp_t} + \theta_3 \mathrm{LO_t} + \theta_4 \mathrm{PGDP_t} \tag{1}$$

where HC is the human capital, RR is the resource rents, Crp is corruption, LO is law and order, and PGDP is the per capita GDP.

*2.3. Empirical Model and Estimation Procedure*

This section describes the empirical investigation of the impacts of resource rents and institutional quality on human capital. Thus, Equation (1) is written as follows:

$$\mathrm{HC_t} = \alpha_o + \theta_1 \mathrm{RR_t} + \theta_2 \mathrm{Crp_t} + \theta_3 \mathrm{LO_t} + \theta_4 \mathrm{PGDP_t} + \mu_t \tag{2}$$

where $\alpha_o$ is constant, $\mu_t$ is the error term, and $\theta_1 \ldots \theta_4$ are parameters.

*2.4. Autoregressive Distributed Lag Model*

To derive the short- and long-term results, this study applied the autoregressive distributed lag model (ARDL). The general form of the ARDL model of Equation (2) is as follows:

$$\begin{aligned} \Delta \mathrm{HC_t} = {} & \alpha_0 + \sum_{i=1}^{t} \delta_i \Delta \mathrm{HC_{t-i}} + \sum_{i=1}^{t} \rho_i \Delta \mathrm{RR_{t-i}} + \sum_{i=1}^{t} \omega_i \Delta \mathrm{Crp_{t-i}} + \sum_{i=1}^{t} \varphi_i \Delta \mathrm{LO_{t-i}} \\ & + \sum_{i=1}^{t} \emptyset_i \Delta \mathrm{PGDP_{t-i}} + \lambda_1 \mathrm{HC_{t-1}} + \lambda_2 \mathrm{RR_{t-1}} + \lambda_3 \mathrm{CRP_{t-1}} + \lambda_4 \mathrm{LO_{t-1}} \\ & + \lambda_5 \mathrm{PGDP_{t-1}} + \mu_t \end{aligned} \tag{3}$$

where $\alpha_0$ is the constant, and the terms $\delta_i$, $\rho_i, \emptyset_i, \omega_i$, and $\varphi_i$ are the parameters used for short-term analysis, while $\lambda_1$, $\lambda_2$, $\lambda_3$, $\lambda_4$, and $\lambda_5$ are used for estimating long-term parameters. t is the time period and i is the lag length. The Wald restriction test is used to test the long-term relationship or cointegration between the dependent and the independent variables. The value of the F-test is taken by applying the coefficient diagnostic Wald restriction test on long-term variable parameters. The hypothesis for the cointegration test is

$$\mathrm{H_0} = \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0 \text{ (means no cointegration)}$$

$$\mathrm{H_1} = \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq 0 \text{ (means there is cointegration)}$$

The F-test is based on the number of regressors in the model. If the F-stat value is greater than the value of the upper bound, then the null hypothesis will be rejected to conclude that there is cointegration and a long-term relationship exists between the dependent and independent variables. If the value of the F-stat is lower than the value of the lower bound, then the null hypothesis is not rejected, which shows that there is no cointegration means and no long-term relationship exists. Finally, if the F-stat is between the lower and upper bounds, the result is inconclusive.

The order of the lag length in the ARDL model was selected using Akaike's information criteria (AIC). If the cointegration was statistically significant, then the values of the long-term parameters were found by normalizing the long-term equation and estimating the error correction model for the short-term analysis.

Under the assumption of steady-state conditions, the long-term equation is $\Delta HC_i = 0$.

This means that

$$\Delta HC = HC_t - HC_{t-1} = 0 \Rightarrow HC_t = HC_{t-1}$$

By applying the above assumption and dividing by $\lambda_1$, Equation (3) can be written in the long-term form as follows:

$$\frac{\lambda_1}{\lambda_1} HC_t = \frac{\lambda_2}{\lambda_1} RR_{t-1} + \frac{\lambda_3}{\lambda_1} CRP_{t-1} + \frac{\lambda_4}{\lambda_1} LO_{t-1} + \frac{\lambda_5}{\lambda_1} PGDP_{t-1} \tag{4}$$

Now, by re-parameterizing,

$$HC_t = \psi_0 + \psi_1 RR_{t-1} + \psi_2 CRP_{t-1} + \psi_3 LO_{t-1} + \psi_4 PGDP_{t-1} \tag{5}$$

Now $\psi_1$, $\psi_{2,}$ $\psi_{3,}$ and $\psi_{4,}$ are the long-term parameters, and their values and signs determine the long-term relationships between the dependent variable and the independent variables in the model. For the short-term analysis, the error correction model was used.

### *2.5. Error Correction Model*

When a long-term relationship exists between the variables, then there is an error correction representative model, so the following error correction model was run in the third step:

$$\begin{aligned} \Delta HC_i = \alpha_0 &+ \sum_{i=1}^{t} \delta_i \Delta HC_{t-i} + \sum_{i=1}^{t} \rho_i \Delta RR_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta PGDP_{t-i} + \sum_{i=1}^{t} \omega_i \Delta Crp_{t-i} \\ &+ \sum_{i=1}^{t} \varphi_i \Delta LO_{t-i} + \gamma ECM_{t-1} \end{aligned} \tag{6}$$

The coefficient of the $ECM_{t-1}$ determines the speed of adjustment towards equilibrium in case of any disturbance.

## 3. Results and Discussion

### *3.1. Unit Root Test*

In this study, the level of stationarity and the order of cointegration were checked by applying the augmented Dickey Fuller tests. The results of the unit root test are given in Table 2. It was found that the null hypotheses of the unit root cannot be rejected for PGDP, human capital, law and order, and corruption at the level of stationarity, but these variables were shown to be stationary at first difference. However, the resource rents were shown to be stationary at level I (0).

**Table 2.** Results of the augmented Dickey Fuller unit root test.

| | Level | 1st Difference |
|---|---|---|
| Per capita GDP | −1.684646<br>(0.4282) | −3.8454 ***<br>(0.0067) |
| Human Capital | −0.318979<br>(0.9103) | −3.546670 **<br>(0.0137) |
| Resource Rents | −2.888092 **<br>(0.0586) | |
| Law and Order | −2.39222<br>(0.1523) | −5.661424 ***<br>(0.0001) |
| Corruption | −0.631428<br>(0.2907) | −4.02520 ***<br>(0.0043) |

The values in the brackets represent *P*-values: *** and** show significance at 99% and 95% confidence intervals.

### 3.2. Autoregressive Distributed Lag (ARDL) and Bound Test

As the variables follow different orders of integration, ARDL is an appropriate econometric technique to follow. After the ARDL, we applied the cointegration bound test, as shown in Table 3. The results show that all values of F-statistics are higher than the 95 percent confidence interval, and the value for human capital is 33.62; therefore, the long-term relationship was confirmed. We then continued to the cointegration and error correction model results.

**Table 3.** Cointegration bound test results.

| Dependent Variable | F-Statistics | K |
|---|---|---|
| Human Capital | 33.62 | 4 |

### 3.3. Short-Term and Long-Term Results

The equation of human capital was estimated for human capital while controlling corruption, law and order, and per capita GDP, and the results are shown in Table 4. The stability of the model was proven by the error correction term (ECT), which depicts that 10 percent of error is corrected successfully each year.

The results show that the one-year lag resource rent negatively affects the human capital in the short-term, and the same effects appear in the long-term between the resource rents and human capital. This indicates that a one percent increase in resource rents causes a decline in human capital by 0.16 percent in the long-term.

Moreover, current corruption has a negative and significant relationship with human capital in the short-term at the 90 percent confidence interval. Also, corruption has a significant negative effect on human capital in the long-term. This shows that a one percent increase in corruption causes a decline in human capital by 0.14 percent in the long-term and 0.001 percent in the short-term. However, law and order has positive and significant impacts on human capital in both the short- and long-term at a 95 percent confident interval. This reveals that a one percent increase in law and order causes enhancements in human capital by 0.02 percent and 0.27 percent in the short and long-term, respectively. In addition, the lag of per capita GDP shows a significant positive relationship with human capital, while it appears to be insignificant in the long-term.

Further, the cumulative sum control chart (CUSUM) and CUSUM of squares tests were applied, and both tests indicated that the model is stable (see Appendix A, Figures A1 and A2).

**Table 4.** Impacts of resource rents and institutional quality on human capital.

| Variable | Coefficient | *t*-Statistics | Prob. |
|---|---|---|---|
| **Short-Term Results:** | | | |
| Resource Rents | −0.001 | −0.102 | 0.919 |
| Resource Rents (−1) | −0.013 * | −1.764 | 0.095 |
| Corruption | −0.001 * | −1.689 | 0.096 |
| Corruption (−1) | 0.009 | 1.345 | 0.196 |
| Law and Order | 0.029 ** | 2.302 | 0.034 |
| Per capita GDP | 0.000 | 0.015 | 0.987 |
| Per capita GDP (−1) | 0.172 *** | 3.900 | 0.001 |
| ECT (−1) | −0.107 *** | −8.404 | 0.000 |
| **Long-Term Results:** | | | |
| Resource Rents | −0.169 * | −1.790 | 0.093 |
| Corruption | −0.140 * | −1.801 | 0.089 |
| Law and Order | 0.276 ** | 2.465 | 0.024 |
| Per capita GDP | −0.245 | −0.869 | 0.396 |
| C | 5.234 | 1.382 | 0.184 |

Note: ***, ** and * show significance at the 99%, 95%, and 90% confidence intervals.

*3.4. Discussion*

Natural resources appear to crowd out human capital in the UAE. One possible reason for this is that the huge oil windfalls trigger a false sense of confidence [56] that pushes citizens to ignore their children's education and causes the government to keep education as a low priority. The results confirm what is known as the social resource curse [1, 26, 40, 57]

In the UAE, corruption is negatively correlated with human capital. In this case, the reason is likely because corruption reduces the funding for human capital, wasting good opportunities and influencing education outcomes. A negative relationship is shown in studies by [33, 47,49,]

Moreover, since "law and order" positively affects human capital, the results confirm the fact that better institutional quality increases the incentive to learn and raises the skills of the labor force. Similar results were found by [27].

The finding of PGDP and human capital was also realized by [37] The logic behind the positive relationship is that income describes the well-being of individuals, so income growth drives schooling by assigning more resources to education, increasing access to high levels of education and knowledge, and offering more opportunities and expenses for educated workers and education. However, the cause of the insignificancy in the long-term is likely because people are not prioritizing the education sector with the growing level of income in the long-term.

## 4. Conclusions

This paper investigated the nexus between natural resource rents, institutional quality, and human capital in the United Arab Emirates. The ARDL model and cointegration techniques were used to study the social aspects of the resource curse by taking human capital as the dependent variable.

Natural resource rents appear to crowd out education as a proxy for human capital in the short- and long-term in the UAE. This slows down the pace of the progress of economic development, as human capital is a key driver of growth in any country. This is mainly because natural resources appear to crowd out human capital due to the false sense of security that reduces the incentives of households to educate their children and pushes the government to keep education as a low priority. The results confirm the social resource curse [40,57] Moreover, corruption deteriorates human capital, while law and order enhance human capital, confirming the fact that good institutional quality encourages learning and skill development.

On the other hand, the lag in income (PGDP) in the UAE contributes positively to human capital, as the higher the income is, the more schooling, knowledge, and experiences are attained. Notwithstanding, a high income is observed to play an insignificant role in enhancing human capital in the long-term.

Presently, natural resources are believed to be a blessing for UAE, since the huge windfalls from these natural resources boost investments, employment, as well as per capita GDP. Yet, deterioration in human capital could turn this blessing into a curse by slowing the pace of economic development. Accordingly, it is suggested that if the UAE desires to continue receiving the full benefits from this blessing, more attention and funding should target human capital through education.

Besides, authorities in the UAE should consider stimulating their economic performance by improving human capital, since higher levels of education can help to achieve efficient management of resources and can shift the comparative advantage from the natural resource sector to the manufacturing sector. The manufacturing sector accelerates what is known as "learning by doing" and demands higher skills and technology, hence guaranteeing diversification and sustainability.

In our study, it was observed that a higher institutional quality enhances education levels in case of the UAE in the short and long-term. Consequently, it is essential to ensure better law and order conditions and control corruption and the overall institutional environment to improve human capital.

All in all, it is believed that exporting natural resources can increase the financial revenue and reduce the budget constraints of government expenditure, even though these revenues are volatile and uncertain. Thus, this study suggests that the government should invest more in education, augment educational opportunities, and encourage the populace to receive education.

## 5. Limitations and Future Research

This study has potential limitations related to the time period used that have to be noted. The data duration was limited to 30 years, from 1984 to 2014, which represents the full extent of publicly available data. Although the data were adequate to show reliable results under the ARDL approach, more data would have been desirable.

There is scope for comparative studies between resource-rich countries that would allow the effects of natural resources to be explored within different countries, such as a comparison between resource-rich countries in the Gulf and technologically advanced resource-rich countries such as Norway, which have comparable diversification policies. The extension of this study and the application of the model to all Gulf Countries and other resource-rich countries would confirm the generalizability of the results, which is a fundamental element in any study.

**Author Contributions:** The author has completed this research article solely.

**Funding:** This research has received no external funding.

**Acknowledgments:** I have to thank my supervisor Dr Andrew Angus for his comments and support during this research.

**Conflicts of Interest:** The author declares no conflict of interest.

**Appendix A.** Impact of Resource Rents on Human Capital

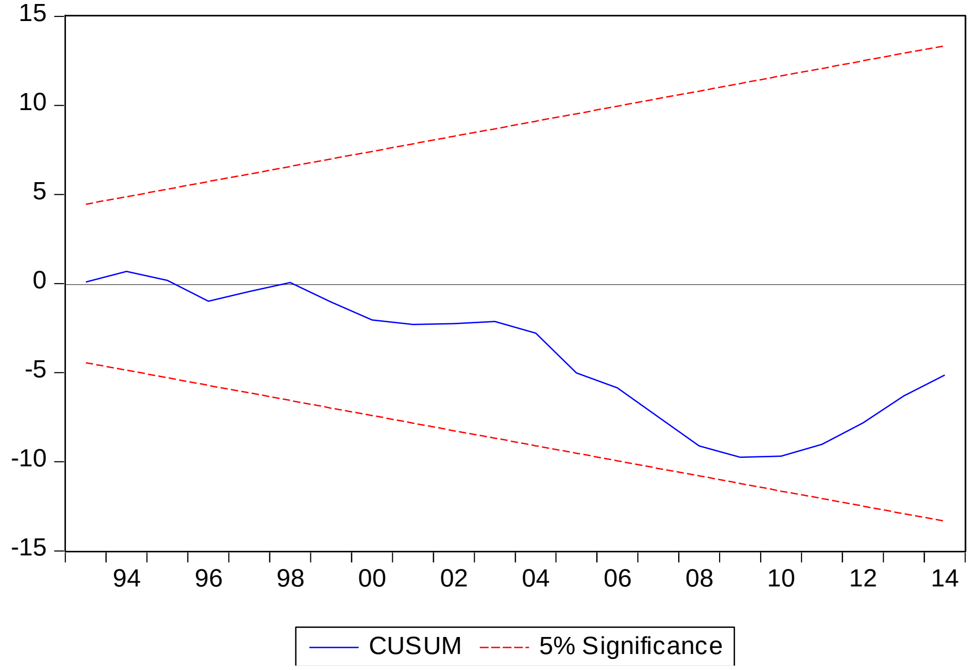



**Figure A1.** CUSUM stability test.

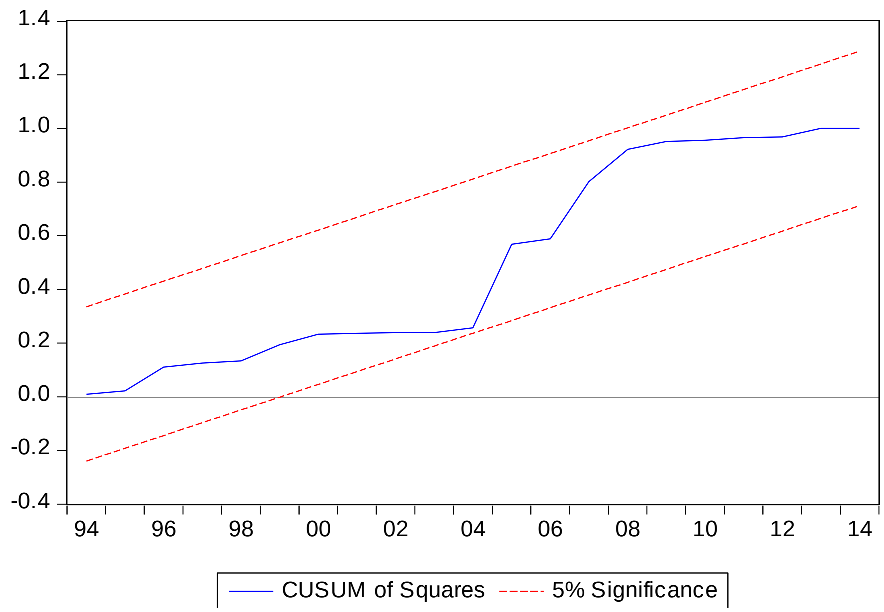



**Figure A2.** CUSUM of squares stability test.

## References


1. Bravo-Ortega, C.; De Gregorio, J. *The Relative Richness of the Poor? Natural Resources, Human Capital, and Economic Growth*; World Bank: Washington, DC, USA, 2005
2. Sachs, J.D.; Warner, A.M. *Natural Resources Abundance and Economic Growth*; NBER Working Paper No. 5398; National Bureau for Economic Research: Cambridge, UK, 1995; doi:10.3386/w5398.
3. Frankel, J.A. *The Natural Resource Curse: A Survey*; NBER Working Paper No. 15836; the National Bureau of Economic Research: Cambridge, Massachusetts, 2010.
4. Gylfason, T.; Herbertsson, T.; Zoega, G. A mixed blessing: Natural resources and economic growth. *Macroecon. Dyn.* **1999**, *3*, 204–225.
5. Moradbeigi, M.; Law, S.H. The role of financial development in the oil-growth nexus. *Resour. Policy* **2017**, *53*, 164–172.
6. Kurtz, M.J.; Brooks, S.M. Conditioning the "Resource Curse": Globalization, Human Capital, and Growth in Oil-Rich Nations. *Comp. Political Stud.* **2011**, *44*, 747–770.
7. Cockx, L.; Francken, N. Extending the concept of the resource curse: Natural resources and public spending on health. *Ecol. Econ.* **2014**, *108*, 136–149.
8. Shao, S.; Yang, L. Natural resource dependence, human capital accumulation, and economic growth: A combined explanation for the resource curse and the resource blessing. *Energy Policy* **2014**, *74*, 632–642.
9. Cockx, L.; Francken, N. Natural resources: A curse on education spending? *Energy Policy* **2016**, *92*, 394–408.
10. Faria, H.J.; Montesinos-Yufa, H.M.; Morales, D.R.; Navarro, C.E. Unbundling the roles of human capital and institutions in economic development. *Eur. J. Political Econ.* **2016**, *45*, 108–128.
11. Armstrong, M. *A Handbook of Human Resource Management Practice*, 10th ed.; Kogan Page Limited: London, UK, 2006.
12. Romer, P.M. Endogenous Technological Change. *J. Political Econ.* **1990**, *98*, 71–102.
13. Barro, R.J. Determinants of Economic Growth: A Cross-Country Empirical Study. *Foreign Aff.* **1997**, *76*, 154.
14. Aghion, P.; Caroli, È.; García-Peñalosa, C. Inequality and Economic Growth: The Perspective of the New Growth Theories. *J. Econ. Lit.* **1999**, *37*, 1615–1660.
15. Romer, P.M. Increasing Returns and Long-Run Growth. *J. Political Econ.* **1986**, *94*, 1002–1037.
16. Krueger, A.B.; Lindahl, M. Education for Growth: Why and for Whom? *J. Econ. Lit.* **2001**, *39*, 1101–1136.
17. Temple, J. Growth Effects of Education and Social Capital in the OECD Countries. *Hist. Soc. Res.* **2001**, *27*, 5–46.

18. Sala-I-Martin, X.; Doppelhofer, G.; Miller, R.I. Determinants of Long-Term Growth: A Bayesian Averaging of Classical Estimates (BACE) Approach. *Am. Econ. Rev.* **2004**, *94*, 813–835.
19. Sianesi, B.; Van Reenen, J. The Returns to Education: Macroeconomics. *J. Econ. Surv.* **2003**, *17*, 157–200.
20. Hanushek, E.A.; Woessmann, L. *The Role of Education Quality for Economic Growth*; World Bank Policy Research Working Paper No. 4122; World Bank: Washington, DC, USA, 2007. Available online: https://ssrn.com/abstract=960379 (accessed on 11 February 2019).
21. Birdsall, N.; Pinckney, T.; Sabot, R. Natural Resources, Human Capital, and Growth. In *Resource Abundance and Economic Growth*; Auty, R., Ed.; Oxford University Press: New York, NY, USA, 2001; pp. 57–75, doi:10.1093/0199275785.003.0004.
22. Blanco, L.; Grier, R. Natural resource dependence and the accumulation of physical and human capital in Latin America. *Resour. Policy* **2012**, *37*, 281–295.
23. Barro, R.J. Economic Growth in a Cross Section of Countries. *Q. J. Econ.* **1991**, *106*, 407.
24. Bulte, E.H.; Damania, R.; Deacon, R.T. Resource intensity, institutions, and development. *World Dev.* **2005**, *33*, 1029–1044.
25. Costantini, V.; Monni, S. Environment, human development and economic growth. *Ecol. Econ.* **2008**, *64*, 867–880.
26. Carmignani, F. Development outcomes, resource abundance, and the transmission through inequality. *Resour. Energy Econ.* **2013**, *35*, 412–428.
27. Faruq, H.A.; Taylor, A.C. Quality of Education, Economic Performance and Institutional Environment. *Int. Adv. Econ. Res.* **2011**, *17*, 224–235.
28. Sun, H.-P.; Sun, W.-F.; Geng, Y.; Kong, Y.-S. Natural resource dependence, public education investment, and human capital accumulation. *Pet. Sci.* **2018**, *15*, 657–665.
29. Acevedo, S. Measuring the Impact of Human Capital on the Economic Growth of South Korea. *J. Korean Econ.* **2008**, *9*, 113–139. Available online: File:///C:/Users/raalj/AppData/Local/Packages/Microsoft.MicrosoftEdge_8wekyb3d8bbwe/TempState/Downloads/Measuring_the_Impact_of_Human_Capital_on_the_Econo%20(1).pdf. (accessed on 22 September 2017).
30. Feenstra, R.C.; Inklaar, R.; Timmer, M.P. The Next Generation of the Penn World Table. *Am. Econ. Rev.* **2015**, *105*, 3150–3182.
31. Kim, D.-H.; Lin, S.-C. Human capital and natural resource dependence. *Struct. Chang. Econ. Dyn.* **2017**, *40*, 92–102.
32. Olayungbo, D. O.; Adediran, K. A. Effects of Oil Revenue and Institutional Quality on Economic Growth with an ARDL Approach. *Ener and Pol Res.* **2017**, 4, 44–54.

33. Akpan, G.E.; Chuku, C. Natural Resources, Human Capital and Economic Development in Nigeria: Tracing the Linkages. *J. Econ. Sustain. Dev.* **2014**, *5*, 40–51
34. Busse, M.; Gröning, S. The resource curse revisited: Governance and natural resources. *Public Choice.* **2013**, *154*, 1–20.
35. Arezki, R.; Van Der Ploeg, F. Do Natural Resources Depress Income Per Capita? Rev. Dev. Econ. 2011, 15, 504–521.
36. Bils, M.; Klenow, P.J. Does Schooling Cause Growth? *Am. Econ. Rev.* **2000**, *90*, 1160–1183.
37. Brückner, M.; Gradstein, M. *Income and Schooling*; CEPR Discussion Paper; Centre for Economic Policy Research: London, UK, 2013.
38. World Bank. World Development Indicators. 2017. Available online: www.data.worldbank.org (accessed on 20 December 2018).
39. Carmignani, F.; Avom, D. The social development effects of primary commodity export dependence. *Ecol. Econ.* **2010**, *70*, 317–330.
40. Gylfason, T. Natural resources, education, and economic development. *Eur. Econ. Rev.* **2001**, *45*, 847–859
41. Atkinson, G.; Hamilton, K. Savings, Growth and the Resource Curse Hypothesis. *World Dev.* **2003**, *31*, 1793–1807.
42. Okada, K.; Samreth, S. Corruption and natural resource rents: Evidence from quantile regression. *Appl. Econ. Lett.* **2017**, *24*, 1490–1493.
43. Elbadawi, I.A.; Soto, R. Resource rents, institutions, and violent civil conflicts. *Def. Peace Econ.* **2015**, *26*, 89–113.
44. Farhadi, M.; Islam, M.R.; Moslehi, S. Economic Freedom and Productivity Growth in Resource-rich Economies. *World Dev.* **2015**, *72*, 109–126.
45. Bhattacharyya, S.; Hodler, R. Do Natural Resource Revenues Hinder Financial Development? The Role of Political Institutions. *World Dev.* **2014**, *57*, 101–113.
46. Anthonsen, M.; Löfgren, Å.; Nilsson, K.; Westerlund, J. Effects of rent dependency on quality of government. *Econ. Gov.* **2012**, *13*, 145–168.
47. Azfar, O.; Gurgur, T. Does Corruption Affect Health and Education Outcomes in the Philippines? *Econ. Gov.* **2008**, *9*, 197–244
48. Svensson, J. Eight Questions about Corruption. *J. Econ. Perspect.* **2005**, *19*, 19–42.
49. Chimezie, N.B.; Prince, O.N. Effects of Corruption on Educational System: A Focus on Private Secondary Schools in Nsukka Zone. *Glob. J. Hum. Soc. Sci. A* **2016**, *16*, 59–67.
50. Herzfeld, T.; Weiss, C. Corruption and legal effectiveness: An empirical investigation. *Eur. J. Political Econ.* **2003**, *19*, 621–632.
51. Knack, S.; Keefer, P. Institutions and economic performance: cross-country tests using alternative institutional measures. *Econ. Political* **1995**, *7*, 207–227.

52. Tebaldi, E.; Elmslie, B. Does institutional quality impact innovation? Evidence from cross-country patent grant data. *Appl. Econ.* **2013**, *45*, 887–900.
53. Boschini, A.D.; Pettersson, J.; Roine, J. The Resource Curse and its Potential Reversal. *World Dev.* **2013**, *43*, 19
54. ICRG: International Country Risk Guide. 2018. Available online: https://epub.prsgroup.com/products/icrg (accessed on 23 December 2018).
55. Aidt, T.; Dutta, J.; Sena, V. Governance regimes, corruption and growth: Theory and evidence. *J. Comp. Econ.* **2008**, *36*, 195–220.
56. Sachs, J. D.; Warner, A. M. The Curse of Natural Resources. *European Econ. Rev.* **2001**, 45, 827-838.
57. Behbudi, D.; Karami, A.; Mamipour, S. Natural resource abundance, human capital and economic growth in the petroleum exporting countries. *J. Econ. Dev.* **2010**, *35*, 81–102.

# APPENDIX H.

***The Fourth Article:*** The Manuscript submitted for publication and it is under review at *Resources Policy.*

## An Assessment of the Economic Impact of Natural Resources Abundance in the Kingdom of Saudi Arabia


## Abstract

In recent decades, the dilemma of natural resource endowments has gained immense importance. It has been argued that natural resources are either a blessing or a curse for any resource rich country. Given the critical role these natural resources play in the economy, the present study estimates the long run and short run impacts of natural resource rents on GDP per capita and Total Factor Productivity in the Kingdom of Saudi Arabia. For this purpose, the cointegration and error correction approach based on the autoregressive distributed lags model is used. The results indicate that natural resource rents increase per capita GDP and Total Factor Productivity significantly in the long run, highlighting that natural resources are considered as a blessing for the Kingdom of Saudi Arabia in the long run. Moreover, enhancement in human capital increases per capita GDP and total factor productivity significantly in the long run. Based on these results, the study suggests that investing in human capital is an urgent move to reach sustainability in the long run, and to decrease reliance on natural resource rents to circumvent the occurrences of the resource curse in the future.



**Keywords: Resource Rents, Resource Curse, Institutional Quality, Human Capital, Per Capita GDP, TFP, ARDL, Kingdom of Saudi Arabia**

## 1. Introduction

The Middle Eastern Kingdom of Saudi Arabia (KSA), covering approximately two million square kilometers, is the largest country in the Middle East, and the 12th largest in the world. In economic terms, the KSA has the largest GDP in the Middle East and the 18th largest in the world. It is notable for its dependence on oil. As a member of the Organization for Petroleum Exporting Countries (OPEC) the KSA has the world's largest natural gas reserve and the second largest crude oil reserve. Oil sales account for 45% of GDP and 90% of total exports and 75% of government earnings (OPEC, 2018).

After the discovery of oil, KSA started to enjoy the benefits of such huge reserves of oil as well as the resulting oil windfalls. Oil became a revenue source that is linked to the overall wealth of KSA. Also, these windfalls were the cornerstones of the modern growth since they were dedicated for the comprehensive governmental planning and projected budgets of KSA. The other main benefits include the major change in infrastructure and the increase in per capita income from about US$ 1177 in 1971 compared to US$ 20,760 in 2017. This is mirrored in the percentage of Saudi citizens in government jobs that represent around 93% of the government sector; while the largest percentage of around 87% in the private sector are non-Saudis (SA Ministry of Commerce and Investment, 2018).

While many would view the wealth of natural resources as a blessing, there is a substantial literature that lists the damaging effects of this wealth, such as crowding out of non-oil exports that can negatively affect other aspects in the economy. This problem has been called the resource curse. However, the resource curse is a contested idea, with some authors have demonstrated that natural resource wealth have a positive economic impact. For instance, Nurkse (1953) and Rostow (1960) found that natural resources contribute positively to economic development, but as the resource curse phenomena exists, this view has been challenged.

As a universally accepted theory of the resource curse is absent, and most explanations of the resource curse have a crowding-out logic, which is simplified by Sachs and Warner (2001) as when natural resources crowd-out certain activity and this activity drives growth, then natural resources would harm growth. Our objective is to test whether there is an evidence for the resource curse for TFP and per capita GDP in KSA, by examining the impact of natural resource wealth proxied as resource rents on per capita GDP and TFP and whether the association exists between these factors and how are they reflected on the Saudi economy. This study is organized as follow, the literature review is presented in section 2, section 3 contains modeling approach, section 4 presents data and variable description, section 5 presents the results and discussion, and the conclusion is in section 6.

## 2. Literature Review

The common believe between economics profession was that natural resources are an absolute blessing to any country until World War II. However, this proved wrong in the post period in that many resource rich countries have experienced slow growth. Here, when the resource curse (RC) phenomena started to be the dilemma that an extensive amount of literature was trying to answer (Sachs and Warner, 1995, 1997, 1999, 2001; Sala-i-Martin, 1997 and Sala-i-Martin et al., 2004). Ross (2015) defined the resource curse as “the adverse effects of a country's natural resource wealth on its economic, social, or political well-being” (Ross, 2015).

Since the late 1980s, a large number of empirical papers, covering different time spans and geographic areas, has emerged to challenge the general picture of the resource curse theory, which look at the link between natural resources and growth and whether natural resources are a blessing or a curse for developing countries (Gylfason and Zoega 2006; Stevens and Dietsche 2008; Neumayer 2004; Arezki and Van der Ploeg 2011). Several studies show evidence of a negative impact of natural resources on economic growth, which supports the resource curse theory (Moradbeigi and Law, 2017; Ahmed et al., 2016; Cockx and Francken, 2016). Whereas, few studies find this impact to be positive or even no impact on growth, which contradicts the resource curse theory (Oyinlola et al., 2015; James, 2015; Ji et al., 2014). In a recent study by Shahbaz et al, (2019), the authors find that natural resource *abundance* benefits growth, while natural resource *dependence* depresses economic growth because it prevents the economic activities, as found in James and Aadland (2011), and Taguchi and Lar (2016).

Both social and economic scientists have introduced new aspects of the resource curse hypothesis. Lately, new approaches and reasons to this hypothesis have been added in the literature. Although it is of a great importance to study the association between natural resources and overall growth, we still need to identify the different aspects or transmission channels through which the curse works. Meaning that natural resources can impact growth through their impact on the determinants of growth, i.e., TFP (Solow, 1957; Abramovitz, 1956; Hall and Jones, 1999; Caselli, 2005). According to Arezki and van der Ploeg (2011) that there were no serious efforts to disentangles the reasons behind the adverse effect of resources on growth.

Actually, a careful look at TFP is crucial, since it is a key factor of the Solow growth model, thus it is fundamental for continuous growth. As pointed out by Klenow and Rodriguez-Clare (1997), around 90% of the differences in income per capita can be described by differences in TFP. Also, other scholars have confirmed that factor accumulation is not the reason behind the differences in cross-country GDP growth rates, however, it is the result of differences in TFP (Easterly and Levine, 2001; Dasgupta et al., 2005). TFP is determined by natural resources (Badeeb and Lean, 2017), human capital (Kumar and Chen, 2013), institutional quality (Tebaldi, 2016), financial and monetary development (Bencivenga and Smith, 1991) and inflation (Fischer, 1993).

With respect to natural resources, an increasing number of studies have looked at the impact of natural resource dependence on TFP instead of economic growth (Badeeb and Lean, 2017; Farhadi et al., 2015; Gylfason and Zoega, 2006; Papyrakis and Gerlagh, 2004). Badeeb and Lean (2017) was the first to conduct a time series study to identify the impact of natural resources on productivity and concluded that the impact is negative. In the same context, Farhadi et al. (2015) concluded that natural resources have a negative impact on productivity. They argued that the higher economic freedom, the better the relationship between natural resources and productivity.

Important clarifications were mentioned in the literature of how natural resources affect TFP.

In resource rich countries, there is a productivity difference that appear between the non-resource sector and the resource sector due to the fact that increased resource revenues cause neglection in the non-resource sectors (manufacturing) that are advantageous to long-run growth. According to Singer (1950) that manufactures "provide the growing points for increased technical knowledge, urban education, the dynamism, and resilience that goes with urban civilization". Therefore, manufacturing would offer more spillovers compared to trading in natural resources. While these resources cause an overinvestment in the natural resource sector, TFP declines, which is mirrored in the diminishing growth of GDP (Corden, 1984; Corden and Neary, 1982; Papyrakis and Gerlagh, 2004). Moreover, Gylfason and Zoega (2006) proved that over reliance on natural resources, leads to misallocation of the invested capital. Due to the less developed financial system and government subsidies or trade constraints, capital got shifted to unproductive usages in state-owned organizations or in secured industries, where it is known that capital might be less productive than in the private sector.

A relatively new angle has been tested in few studies about the issue of whether dynamic relationships may exist among the variables when comparing studies that focus on the impact of natural resources on economic growth. For instance, Shahbaz et al. (2018) evaluated the impacts of natural resources on financial development in the United States, using ARDL bound testing and controlling for education, capital and economic growth as control variables. The study confirms the existence of a long-run relationship between all the variables, positive effects of natural resources, education and growth on financial development, and a negative effect of capital. Hamdi and Sbia (2013a) analyzed the case of Algeria by using annual data of natural resource rents, GDP, and trade openness to investigate their dynamic relationships, the results shed light on the importance of diversification in Algeria and not to rely on one source of revenues. Another study by Hamdi and Sbia (2013b) was conducted on Bahrain, by examining the interrelationship between oil revenues, government expenditures and GDP. The oil revenues show a positive impact on growth, concluding that oil revenues remain as the main channel that funds the government expenditures and the main source of growth in a resource rich country like Bahrain. By using the ARDL model, Satti et al. (2014) confirmed the existence of the resource curse in Venezuela when the authors examined the link between natural resources, financial development, economic growth, trade openness, and capital stock.

Although, several studies have disclosed important factors that affect TFP, no consensus has been reached on the nature of the effect of these factors on TFP (Tebaldi, 2016). Hence, it would be of a great interest to check the impact of human capital as well as institutional quality on TFP and per capita GDP. This would give a fair picture of the relationship between the variables that are identified to be important factors that determine the TFP. Generally, by looking at the literature, the effects of the previously mentioned factors on TFP are far from being settled. The results in every case are different. This justifies the current resurgence of studies about the relationship or the impact of human capital, institutional quality (Tebaldi, 2016), and natural resources (Badeeb and Lean, 2017) on TFP and per capita GDP especially in developing countries.

With regard to human capital, several scholars provided empirical support for the positive and significant effect of human capital on TFP (Kumar and Chen, 2013; Liberto et al. 2011; Aiyar and Feyrer 2002; Benhabib and Spiegel 1994). Theoretically, it has been suggested that human capital affects TFP positively in different ways. First, human capital and education specifically, helps people build up skills and knowledge to facilitate the adoption and implementation of the new technology (Nelson and Phelps, 1966; Romer, 1990). Second, human capital facilitates the local production of industrial or technical inventions (Romer, 1990; Aghion and Howitt, 1998), thus supporting the proficiency for self-sustaining development. Empirically, it has been found that education, capital flows and research and development affect TFP growth (Cameron, 1998; Griliches, 1992). Moreover, it is found that human capital in the form of employee training is important for TFP, because skilled workers are more productive (Barrett and O'Connell, 1999; Hall and Kramarz, 1998). High returns to education show higher productivity, Psacharopoulos and Patrinos (2004) find that an additional year of schooling lead to an average 10% rise in wages. The logic is that labor skills impact productivity positively due to its inherent contributions to innovation, technological change and capital productivity. Higher labor skills increase the capability to take an advantage from the international capital flows and trade, hence stronger TFP (Loko and Diouf, 2009). Then, as health is part of human capital, many studies confirm that healthy workers are more capable to work, hence they are more productive. Also, workers with good physical condition have less circumstances to be absent (Dasgupta and Ray 1991). Cole and Neumayer (2006) argue that health affects growth through TFP and concluded that poor health harms TFP. Illness is a great burden on individuals, since illness makes them weak and incapable to work or study, and it affects negatively the country's development visions. Both aspects of human capital; health and education; are found to be positively related to TFP (Kumar and Chen, 2013).

On the contrary, Akinlo and Adejumo (2016) find that human capital is negatively associated to TFP, but they related this result to the lack of skillful education system, or to the deteriorating quality of education in Nigeria. Also, the negative relationship was related to the low level of income as in Miller and Upadhyay (2002, 2000). Kumar and Kober (2012) find that education has an insignificant impact on TFP. This suggest that the positive relationship isn't absolute, more precisely in low-income nations that are known with low government spending on education, low investment in research and development, low school's enrolment, and poor quality of education.

It has been highlighted in the growth theory how institutions are important for growth and development (Acemoglu and Robinson, 2004; Acemoglu et al., 2001; Hall and Jones, 1999). Institutions are defined as the rules of the game in an organization and it enforces restrictions that structure individuals' interaction (North, 1990).

Some empirical evidence show that institutional quality is an important determinant of TFP (Tebaldi, 2016). The rationale is that institutions play an important role in improving the efficient use and allocation of resources and production factors (Acemoglu and Robinson, 2004; Pattillo, et al., 2004; Butkiewicz and Yanukkaya, 2006), as well as fostering innovation and technological change (Hall and Jones, 1999; Acemoglu et al., 2005; Dias and Tebaldi, 2012), consequently, these institutions would help in forming an environment that fosters TFP (Tebaldi, 2016) and supports growth and development. Bad institutions may also push the economic agents to participate in unproductive actions such as rent-seeking and theft (Hsieh and Klenow, 2007; Tebaldi and Elmslie, 2013). A well-functioning economy needs good quality of institutions that secure property rights, enforce contracts, limit the power of rulers, maintain the rule of law, control corruption and support political stability (Knack and Keefer, 1995). Absence of secured and well-defined property rights would cause a failure in any investments in Research and Development, and in the accumulation of human and physical capital, hence productivity and growth (Nachega and Fontaine, 2006; Acemoglu and Robinson, 2004). Moreover, political instability harms growth because it spreads uncertainty in the economy, and distresses the business environment, which decrease incentives for investments. It has been argued that neglect of property rights and corruption are damaging to growth (Ehrlich and Lui, 1999).

In another study conducted in resource rich countries, results show higher institutional quality cause higher productivity (Farhadi et al., 2015). Hall and Jones (1999) highlight the idea that due to differences in institutions and policies, per capita income and productivity vary across countries.

Some empirical studies support the adverse impact of corruption on productivity. Corruption as an important measure of institutional quality is defined by Aidt (2003) as the use of public power for individual interest, so it affects the economy negatively (Mo, 2001; Méon and Sekkat, 2005; Lambsdorff, 2007; Aidt et al, 2008). Corruption undermines growth and development through few channels classified by Tanzi and Davoodi (1997), corruption lowers government revenues, lowers the quality of public infrastructure, and rise public investment. Also, corruption educe private investment and amend government expenditures (Mauro, 1995). The most noticeable sign of the adverse impact of corruption on productivity are the 'white-elephant' projects. These projects are known to be totally disregard the demand of the public or they are exhausted soon after their completion (Mauro, 1997). Another explanation of how corruption lowers productivity is when the best-connected contractors who probably pay bribes got selected instead of the contractors offering the best product. Corruption also affect the quality of investment due to the neglection of contracts that control the level of quality. Last, corruption causes rent-seeking, inefficiency and misleading public decisions, consequently renders governments unwilling or unable to attain public welfare (Lambsdorff, 2002; Rose-Ackerman, 1999; Bardhan, 1997).

Looking at the second transmission channel through which natural resources would affect growth, per capita GDP (PGDP). Oil-rich countries have on average high PGDP and poor institutions relative to advanced economies (Alexeev and Conrad, 2009). The authors provided empirical evidence suggesting that large endowments of natural resources (e.g. oil or other minerals) do not hinder long-term economic growth. Their analysis focused on PGDP instead of growth rates over a given period of time. They find that natural resource endowments increased PGDP and income inequality. In related work, Smith (2015) find no evidence to support the resource curse hypothesis, instead resource exploitation is found to have a positive impact on long run PGDP growth in developing countries, and no impact in developed ones. Bravo- Ortega and De Gregorio (2005) find that natural resources have a negative impact on growth rate but a positive impact on income. However, Arezki and van der Ploeg (2011) conclude that resource exports as well as resource abundance dampen GDP per capita.

Furthermore, it has been proven that endowments and PGDP are linked through institutions (Acemoglu et al., 2001; Easterly and Levine, 2003). Hence, the relationship between institutional quality and PGDP has to be examined in this paper. A number of scholars are supporting the fact that selected measure of property rights, rule of law and corruption are related to the growth of PGDP (Dollar and Kraay, 2001; Sala-i-Martin, 1997; Knack and Keefer, 1995; Mauro, 1995). It has been confirmed that adherence to the rule of law; which is revealed as the absence of corruption and the protection of property rights; causes an increase in PGDP and it is essential for growth (Knack and Keefer, 1995; Dollar and Kraay, 2001). Igwike et. al, (2012) tested the association between PGDP and corruption. The authors conclude that higher corruption could lead to lower growth, and vice-versa. They believe that no consent has been reached about the direction of causality among PGDP and corruption. However, Paiders (2008) find no relationship between changes in Corruption Perception Index (CPI) and PGDP.

The impact of human capital in terms of education on PGDP was examined in a number of empirical studies (McDonald and Roberts 2002; Knowles and Owen 1995). The weak relationship that was observed between education and PGDP has led to a debate of whether education impacts per capita GDP indirectly through its impact on TFP or directly as a factor of production (Lucas 1990; Nelson and Phelps 1966). Faruq and Taylor (2011) find that the quality of education has more beneficial effects on PGDP in countries with better institutional environment.

All in all, this chapter examines the likelihood of the resource curse on different macroeconomic factors by paying particular attention on TFP and PGDP. This study is the first attempt to identify the relationship between natural resource dependence and productivity using a time series approach. The existing studies were panel data studies, such as Farhadi et al. (2015) and their results were the motive behind choosing the time series framework to examine these relationships between our variables on a country-specific basis. According to Singh (2008), a time series study is more suitable to estimate the relationships.

## 3. Modelling approach

Solow (1956) presented a simplified but a powerful framework for the analysis of the causes and dynamics of economic growth, then divided the growth rate of the aggregate output between factors of production and technological changes. Solow used the following specification of the production function with Hicks-neutral technology because the change does not affect the balance of labor and capital, rather only affects technological progress, which forms the basis of the methodology of this study.

The novelty of this study is that it adds resource rents (RR), law and order (LO), corruption (CRP) and human capital (HC) into Solow's framework.

$$\ln(y_t) = \alpha \ln(k_t) + \theta_1 RR_t + \theta_2 LO_t + \theta_3 Crp_t + \theta_4 HC_t \qquad \ldots(1)$$

As indicated earlier, much of the literature argues that the resource curse means that resource rents will have a negative impact on countries that are relatively rich in natural resources. This study tests the indirect impact of resource rents on growth and development via total factor productivity. Thus, total factor productivity is explained as follows.

$$tfp = \theta_1 RR_t + \theta_2 LO_t + \theta_3 Crp_t + \theta_4 HC_t \qquad \ldots(2)$$

## Empirical Model and Estimation Procedure

### a. Autoregressive Distributed Lag Model

To derive the short run and long run results, this study applies the Autoregressive Distributed Lag Model (ARDL). The General form of the ARDL model of equation (1) and (2) are transformed into eqution (3) and (4) respectively as follows,

$$\begin{aligned}\Delta PGDP_i = \alpha_0 &+ \sum_{i=1}^{t} \delta_i \Delta PGDP_{t-i} + \sum_{i=1}^{t} \vartheta_i \Delta k_{t-i_i} + \sum_{i=1}^{t} \rho_i \Delta RR_{t-i} \\ &+ \sum_{i=1}^{t} \varphi_i \Delta LO_{t-i} + \sum_{i=1}^{t} \omega_i \Delta Crp_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta HC_{t-i} \\ &+ \lambda_1 PGDP_{t-1} + \lambda_2 k_{t-1} + \lambda_3 RR_{t-1} + \lambda_4 LO_{t-1} + \lambda_5 Crp_{t-1} + \lambda_6 HC_{t-1} \\ &+ \mu_t\end{aligned} \quad \ldots(3)$$

and

$$\begin{aligned}\Delta TFP_i = \alpha_0 &+ \sum_{i=1}^{t} \delta_i \Delta TFP_{t-i} + \sum_{i=1}^{t} \rho_i \Delta RR_{t-i} + \sum_{i=1}^{t} \varphi_i \Delta LO_{t-i} \\ &+ \sum_{i=1}^{t} \omega_i \Delta Crp_{t-i} + \sum_{i=1}^{t} \emptyset_i \Delta HC_{t-i} \\ &+ \lambda_1 TFP_{t-1} + \lambda_2 RR_{t-1} + \lambda_3 LO_{t-1} + \lambda_4 Crp_{t-1} + \lambda_5 HC_{t-1} + \mu_t\end{aligned} \quad \ldots(4)$$

Where $\alpha_0$ is the drift component and the terms $\delta_i$,$\emptyset_i$, $\omega_i$, $\varphi_i$, and $\rho_i$ are the parameters used for the short run analysis while $\lambda_1$, $\lambda_2$, $\lambda_3$, $\lambda_4$, $\lambda_5$ and $\lambda_6$ are used for estimating the long run parameters. The Wald restriction test is used to test the long run relationship or cointegration between the dependent and independent variables. The value of the F-test is taken by applying the coefficient diagnostic Wald restriction test on long run variable parameters. The hypothesis for the cointegration test is

$H_0 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = 0$ (no cointegration detected)

$H_1 = \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq \lambda_6 \neq 0$ (cointegration presents)

The F-test is based on the number of regressors in the model. If the F-stat value is greater than the value of the upper bound, then the null hypothesis will be rejected to conclude that a cointegration and a long run relationship exist between dependent and independent variables. If the value of the F-stat is lower than the value of the lower bound then the null hypothesis is not rejected, and show that there is no cointegration, or long run relationship. Finally, if the F-stat is between the lower bound and upper bound, then it shows that the result is inconclusive. The orders of the lag length in the ARDL model are selected either through the Akaike's information criteria (AIC) or through the Schwarz Bayesian criterion (SBC).

Under the assumption of steady-state condition, the long run equations are; $\Delta PGDP_i = 0$ and $\Delta TFp_i = 0$

Means that,

$$\Delta PGDP = PGDP_t - PGDP_{t-1} = 0 \Rightarrow PGDP_t = PGDP_{t-1}$$

and

$$\Delta TFP = TFP_t - TFP_{t-1} = 0 \Rightarrow TFP_t = TFP_{t-1}$$

By applying the above assumption and dividing by $\lambda_1$ , the equations (3) and (4) can be written in the long run form as follows,

$$\frac{\lambda_1}{\lambda_1} PGDP_t = \frac{\lambda_2}{\lambda_1} k_{t-1} + \frac{\lambda_3}{\lambda_1} RR_{t-1} + \frac{\lambda_4}{\lambda_1} HC_{t-1} + \frac{\lambda_5}{\lambda_1} CRP_{t-1} + \frac{\lambda_6}{\lambda_1} LO_{t-1} \quad \ldots(5)$$

and

$$\frac{\lambda_1}{\lambda_1} TFP_t = \frac{\lambda_2}{\lambda_1} RR_{t-1} + \frac{\lambda_3}{\lambda_1} CRP_{t-1} + \frac{\lambda_4}{\lambda_1} LO_{t-1} + \frac{\lambda_5}{\lambda_1} HC_{t-1} \quad \ldots(6)$$

Now by re-parameterizing,

$$PGDP_t = \psi_o + \psi_1 k_{t-1} + \psi_2 RR_{t-1} + \psi_3 HC_{t-1} + \psi_4 CRP_{t-1} + \psi_5 LO_{t-1} \quad \ldots(7)$$

and

$$TFP_t = \psi_o + \ \psi_1 RR_{t-1} + \psi_2 CRP_{t-1} + \psi_3 LO_{t-1} + \psi_4 HC_{t-1} \qquad \ldots(8)$$

Now, the $\psi_1$ , $\psi_{2,}$ $\psi_{3,}\psi_{4,}$ $and\, \psi_5$ are the long run parameters and their values and signs determines the long run relationship between the dependent variable and the independent variables in the model. For short run analysis, the error correction model has been used.

### b. Error Correction Model

When a long run relationship exists between the variables then there is an error correction representative model, so the following error correction model is run in the third step.

$$\begin{aligned}\Delta PGDP_i \ = \ \alpha_0 + \sum_{i=1}^{t} \delta_i \, \Delta PGDP_{t-i} + \sum_{i=1}^{t} \vartheta_i \, \Delta k_{t-i_{\ i}} \ + \sum_{i=1}^{t} \rho_i \Delta \, RR_{t-i} \\ + \sum_{i=1}^{t} \varphi_i \, \Delta LO_{t-i} \ + \sum_{i=1}^{t} \omega_i \Delta \, Crp_{t-i} + \ \sum_{i=1}^{t} \emptyset_i \Delta \, HC_{t-i} \\ + \gamma ECM_{t-1}\end{aligned} \qquad \ldots(9)$$

and

$$\begin{aligned}\Delta TFP_i \ = \ \alpha_0 + \sum_{i=1}^{t} \delta_i \, \Delta TFP_{t-i} + \sum_{i=1}^{t} \rho_i \Delta \, RR_{t-i} + \sum_{i=1}^{t} \varphi_i \, \Delta LO_{t-i} \\ + \ \sum_{i=1}^{t} \omega_i \Delta \, Crp_{t-i} \ + \sum_{i=1}^{t} \emptyset_i \Delta \, HC_{t-i} \ \ + \gamma ECM_{t-1}\end{aligned} \qquad \ldots(10)$$

The error correction model indicates the speed of the adjustment of the variables to short run shocks back to a long run equilibrium. The coefficient of the $ECM_{t-1}$ determines the speed of adjustment toward equilibrium in case of any disturbance.

## 4. Description of Variables and Data Source

I. Per capita GDP (2010 constant prices) is taken from the World Bank (2017) data source for the period 1984-2014. To get per capita GDP, it is divided by population of KSA for the said period.

II. Capital stock per worker is an independent variable in the model, but the data is unavailable for KSA. Therefore, data on real gross fixed capital formation (in US dollars) at constant prices (2010) is taken from World Bank (2017) to estimate base period capital stock by following Alvi and Ahmed (2014) as:

$$\mathrm{K_0} = \frac{\mathrm{GFK_0}}{\delta + \mathrm{g_{GFK}}} \qquad \ldots (11)$$

Where $k_0$ is the capital stock, $GFK_0$ is level of Gross Fixed Capital Formation, δ is rate of depreciation which we have assumed to be 5% per year and $g_{GFK}$ is average growth in gross fixed capital formation for 1984 to 2014. To calculate data for the targeted years we used the procedure given by the following equation

$$\begin{aligned} K_t &= K_{t-1} - \delta K_{t-1} + GFK_t \\ &= (1-\delta)K_{t-1} + GFK_t \qquad \ldots (12) \end{aligned}$$

Where $k_t$ a capital stock is at current year, $k_{t-1}$ is capital stock in previous year, $GFK_t$ is the Real Gross Fixed Capital Formation and δ is rate of depreciation, as indicated above.

III. Total Factor Productivity (TFP) is the portion of output not explained by the amount of inputs used in production (Comin, 2017). Since the official statistics for KSA are not available, we have obtained data of TFP from Penn World Table (2017) for 1984 to 2014. Penn World table version 9 is a database, which provides the TFP data for 182 countries.

IV. Education (HC) was used as a proxy for human capital, because human capital is often regarded as the accumulation of education and past studies have confirmed that productivity and economic growth are markedly influenced by educational accomplishments (Gennaioli et al., 2013; Ciccone and Papaioannou, 2009). Similarly, Nachega and Fontaine (2006) have shown that a well-educated and healthy work force directly or indirectly increase TFP and thus economic growth. This variable has been used in past studies such as, Thyne, (2006), Urdal (2008), Bussmann (2007) and Agbor (2015).

V. Institutional Quality (IQ) data is taken from International Country Risk Guide (ICRG, 2017) by the PRS Group from 1984 to 2014. This study uses "law and order" and "control of corruption" as a proxy of IQ (Stoian and Filippaios, 2007; Herzfeld and Weiss, 2003; Tebaldi and Elmslie, 2013). Law and order (LO) "reflects the degree to which the citizens of a country are willing to accept the established institutions to make and implement laws and adjudicate disputes" (Knack and Keefer, 1995). Corruption (CRP) is defined as the illegal payments to government officials. Corruption is measured as "control of corruption" in ICRG, this score has been inverted into corruption in this paper. This is a similar approach as Busse and Gröning (2013). Good institution quality enhances the productivity, economic growth and development in the country (Haapanen and Tapio, 2016; Acemoglu and Robinson, 2008; Perera and Lee, 2013).

VI. Resources rents (RR) is taken as an independent variable in this study to check the impact of revenues from natural resources on TFP and per capita GDP. Resource rents are defined as the total % of GDP associated with sales of natural resources from the World Development Indicators (WDI) provided by the World Bank (2017), following Okada and Samreth (2017) and Elbadawi and Soto (2015).

## 5. Results and Discussion

In the time series data, the first step is to check the stationarity and order of cointegration. For this purpose, this study applies the Phillips Perron and Augmented Dickey Fuller tests. Table 1 shows the results of the unit root tests. It is found that the null hypotheses of unit root at level cannot be rejected at 10% level of significance for per capita GDP, TFP, human capital, corruption and law and order but these variables are stationary at first difference I(1). However, resource rents and capital stock are stationary at level I(0).

**Table 1: Results of Unit Root Test**

| **Variable** | **Augmented Dickey Fuller** | | **Phillips Perron** | |
|---|---|---|---|---|
| | Level | 1st Difference | Level | 1st Difference |
| **Per capita GDP** | -1.866311 (0.3429) | -8.618635 (0.0000***) | -1.866311 (0.3429) | -8.718011 (0.0000***) |
| **Human Capital** | 0.833787 (0.9930 | -4.037668 (0.0042**) | 0.638067 (0.9885) | -4.093925 (0.0036**) |
| **Resource Rents** | -3.577925 (0.0492**) | - | -3.577925 (0.0492**) | - |
| **TFP** | -1.247282 (0.6403) | -7.219153 (0.0000***) | -1.247282 (0.6403) | -7.219153 (0.0000***) |
| **Law and Order** | -1.656711 (0.4405) | -3.721377 (0.0001**) | -2.118697 (0.2391) | -5.375346 (0.0001**) |
| **Corruption** | -2.581177 (0.2907) | -5.257008 (0.0002***) | -3.550391 (0.0519) | -5.257008 (0.0002***) |
| **Capital Stock** | -2.955435 (0.0509**) | | -3.395124 (0.0192**) | - |

*Note: The value in the bracket represents P-value. ***, ** and * shows significance at 99%, 95% and 90% confidence interval respectively.*

Table 1 shows that the variables follow different orders of integration, some are stationary at level I(0) and the others are stationary at first difference I(1), and both dependent variables are stationary at level. Hence, ARDL is an appropriate econometric technique to follow in this study. Then, it is crucial when following the ARDL to check whether there is a cointegration between I(0) and I(1) variables. The cointegration bound test by Pesaran et al. (2001) identified two critical values for this cointegration test. The upper critical bound assumes that all variables are I(1); which means that there is cointegration between the studied variables. While, the lower bound assumes that all variables are I(0); which means that there is no cointegration among the variables. If the F-statistic is greater than the upper bound, we reject the null hypothesis of no cointegration. But, if the F-statistic is below the lower bound, the null hypothesis of no cointegration cannot be rejected. The Bound test results are given in Table 2, which shows that all values of F-statistics are higher than 95% confidence interval. The values are 7.22 for per capita GDP and 4.73 for TFP. These results confirm the long and short run cointegration. The K is the degree of freedom that presents the independent variables in our selected model. We can continue to the regression results as all prerequisites to apply ARDL are achieved.

**Table 2: Cointegration Bound Test Results**

| **Dependent Variable** | **F- Statistics** | **K** |
|---|---|---|
| **Per capita GDP** | 7.22 | 5 |
| **TFP** | 4.73 | 4 |

### *5.1. Impact of Resource Rents on Per Capita GDP*

The empirical equation for PGDP is estimated while using resource rents (RR), human capital (HC), law and order (LO), corruption (CRP), and capital stock (K) as independent variables. The Akaike Information Criteria is used for lag selection. The results of long run and short run with error correction term based on ARDL are given in Table 3. The top section is about short run dynamics estimates with the error correction term and the bottom section shows estimates for the long run. The error correction term is significant at 1% with a negative value of 0.91, stating that 91% of error is corrected successively every year and the model is stable.

**Table 3: Impact of Resource Rents on Per Capita GDP**

| Variable | Coefficient | t-Statistics | Prob. |
|---|---|---|---|
| **Short Run Results** | | | |
| Resource Rents | 0.024 | 0.715 | 0.484 |
| Resource Rents (-1) | -0.083 | -1.920 | 0.072* |
| Corruption | -0.281 | -2.140 | 0.048** |
| Law and Order | -0.028 | -1.169 | 0.259 |
| Human Capital | -0.262 | -3.829 | 0.001*** |
| Human Capital (-1) | -0.335 | -3.223 | 0.005*** |
| Capital Stock | 1.456 | 2.891 | 0.010** |
| CointEq(-1) | -0.918 | -5.371 | 0.000*** |
| **Long Run Results** | | | |
| Resource Rents | 0.179 | 3.107 | 0.006*** |
| Corruption | -0.126 | -0.794 | 0.438 |
| Law and Order | -0.030 | -1.094 | 0.290 |
| Human Capital | 0.083 | 3.127 | 0.006*** |
| Capital Stock | 0.016 | 0.069 | 0.945 |
| C | 9.402 | 26.378 | 0.000*** |

*Note: ***, ** and * shows significance at 99%, 95% and 90% confidence interval respectively.*

**Results:**

The short run results show that current resource rents have no effect on PGDP, but the first lag happen to be statistically significant for PGDP with a negative effect of (-0.08%). However, in the long run, resource rents increase PGDP by 0.17%. Corruption and law and order as proxies for institutional quality have different results. Corruption reduces PGDP by 0.28% in short run, however, the effect of law and order is insignificant in both periods.

We got curious results concerning human capital, proxied by education. The one-year lag of human capital shows a negative relationship with PGDP by (-0.33%). Also, it has a negative effect on PGDP by (-0.26%) in the short run, but this turn positive in the long run by 0.08%. Lastly, capital stock is significant in short run by 1.45%, but long run estimates are insignificant.

Further, we have applied CUSUM and CUSUM of Squares tests which confirm the stability of the model and the relationship between dependent and independent variables (see Appendix 1 Figure 1 and 2).

**Discussion:**

One probable explanation for the negative relationship between resource rents and PGDP in the case of KSA, is explicitly mentioned in previous studies that resource rents lead to high public consumption and reduce the incentives for progression and development (Baland and Francois, 2000; Ben-salha et al., 2018). While the opposite result in the long run is found to be aligned with Mehar et al., (2018) and Alexeev and Conrad (2009).

The cause of the negative relationship between corruption and PGPDP is explained clearly in the literature relating it to the reduction of investment in physical capital caused by corruption (Gyimah-Brempong, 2002). This finding is consistent with many studies that confirm the strong statistically significant negative impact of corruption on PGDP (Hassaballa, 2017; Mustapha, 2014; Ugur, 2014).

The reason observed for the negative effects of human capital on PGDP is more likely that the current phase is determined on expenditures on human capital, causing a reduction in PGDP. But the positive effects in the long run prove that the education attained by populace is starting to be advantageous in the economy since it is evidenced in Appiah (2017) that education is essential to promote PGDP due to its role in enhancing human capital.

Finally, capital stock shows important effect in the short run, but the long run estimates are insignificant indicating that physical capital stock is not a necessary factor to increase long run PGDP, but the human capita is more important as it is revealed from the results in the long run.

### *5.2. Impact of Resource Rents on Total Factor Productivity*

The empirical equation for TFP is estimated by using resource rents (RR), human capital (HC), corruption (CRP), and law and order (LO) as independent variables. For lag selection, the Akaike Information Criteria is used. The short run results with error correction term and the long run results based on ARDL model is given in the Table 4.

It is found that the model is stable because the error correction term is significant at 10% with a negative value of 0.48, which means that 48% of error is corrected every year successively.

**Table 4: Impact of Resource Rents on Total Factor Productivity**

| Variable | Coefficient | t-Statistics | Prob. |
|---|---|---|---|
| **Short Run Results** | | | |
| Resource Rents | 0.010 | 0.338 | 0.740 |
| Resource Rents (-1) | -0.013 | -0.264 | 0.795 |
| Resource Rents (-2) | -0.136 | -3.239 | 0.006*** |
| Corruption | -0.410 | -4.015 | 0.001*** |
| Law and Order | -0.062 | -2.115 | 0.054* |
| Law and Order(-1) | -0.042 | -1.593 | 0.135 |
| Law and Order(-2) | -0.044 | -1.916 | 0.077* |
| Human Capital | -0.128 | -1.935 | 0.075* |
| Human Capital (-1) | -0.081 | -0.732 | 0.476 |
| Human Capital (-2) | -0.284 | -2.643 | 0.020** |
| CointEq(-1) | -0.486 | -3.023 | 0.009*** |
| **Long Run Results** | | | |
| Resource Rents | 0.413 | 3.034340 | 0.011** |
| Corruption | -0.844 | -2.948308 | 0.009*** |
| Law and Order | 0.042 | 0.789024 | 0.444 |
| Human Capital | 0.356 | 4.308024 | 0.000*** |
| C | -1.063 | -1.710775 | 0.110 |

*Note: ***, ** and * shows significance at 99%, 95% and 90% confidence interval respectively*

**Results:**

Results are noteworthy in the case of the relationship between resource rents and TFP, as the current and the past resource rents show no impact on TFP in KSA, but the negative effect of resource rents on TFP by (-0.13%) is noticeable after two years on TFP (two-year lag of resource rents). However, in the long run, resource rents increase TFP by 0.4%.

Different results are found in the case of institutional quality; corruption and law and order. Corruption negatively affects TFP in the short by (-0.41%) and long run by (-0.8%) respectively. However, the variable of law and order negatively affects TFP in the current and lag year; 0.06% and 0.04% respectively, while it is insignificant in the long run.

Human capital in its level and two-years lags form is significant, and it affects TFP negatively in the short run. However, 1% increase in human capital, improves TFP by 0.35% in the long run.

We have also applied CUSUM and CUSUM of Squares tests and both tests confirmed the stability of our model (see Appendix 1 Figure 3 and 4).

**Discussion:**

Although the negative effect of resource rents is noticeable after two years on TFP, it turns to a positive effect in the long run. One possible reason to this situation has been mentioned in the resource curse literature, that resource rich countries tend to show overinvestment in the energy sector and neglection of other sectors such as manufacturing and agriculture sectors that are beneficial to productivity and long run growth, resulting in a decrease in productivity (Corden and Neary, 1982; Corden, 1984). Afterwards, resource rich countries start diversifying their economy, building new projects and creating more jobs as they get richer in the long run (Gelb, 2010), resulting in higher TFP.

The negative effect of corruption on TFP is expected as this relationship has been proven in different studies (Boschini et al., 2013; Boschini et al., 2007; Mehlum et al., 2006). Conversely, what is unexpected is the negative effect of the current and the previous law and order on TFP as it contradict the literature. One probable cause for this effect in the case of KSA that the law is strictly enforced, and the local traditions, customs and religions should always be obeyed in an approach or manner that could affect productivity. Another unexpected negative effect on TFP from the current human capital as well as the two-years lags form, probably this result explains how the government is prioritizing spending on education in the short run. Then, in the long run, these skills and knowledge attained by population begin to show the fruitful benefits in the country, hence productivity. The result regarding the positive relationship between human capital and TFP is aligned with the study of Benhabib and Spiegel (1994), Aiyar and Feyrer (2002), Liberto et al. (2011) and Kumar and Chen (2013).

## 6. Conclusion

This study departs from previous empirical studies and thoroughly tests the short run and long run impact of natural resource rents, education and institutional quality on per capita GDP and TFP. The ARDL and ECM modelling clarifies that lagged resource rents decrease per capita GDP, and TFP in the short run. However, in the long run, resource rents increase per capita GDP and TFP. It also implies that corruption reduces TFP both in the short and long run and reduces PGDP but only in the short run. Second year lag of LO decrease TFP in the short run. It is found that human capital has a negative impact on PGDP and TFP in the short run, but in the long run this impact is positive. And as predicted capital stock has a positive impact on PGDP in short run.

We conclude that resource rents is more significant in the case of KSA because of their positive influences in the long run. Moreover, as human capital has a positive impact in the long run, more attention should be given to enhance human capital.

Our study clarifies that despite the potential benefits associated with natural resource wealth for TFP and PGDP in the long run. KSA to reach sustainable economic growth and development should rely less on natural resource rents as a source of income and invest more in human capital, particularly as our results show that human capital helps improving TFP and PGDP in the long run.

In the last but not least, the results support the idea that government should proceed in building new institutions or reforming existing ones that aim at combating corruption to improve TFP and PGDP and ensure that natural resource wealth is wisely produced and consumed.

## **References**:


Abramovitz, M. (1956) 'Resource and Output Trends in the United States Since 1870, NBER Chapters, In: Resource and Output Trends in the United States Since 1870', pp. 1-23 National Bureau of Economic Research, Inc. Available at: http://www.nber.org/chapters/c5650.pdf (Accessed: 20 December 2018).

Acemoglu, D., Robinson, J.A. (2008) *'The role of institution in growth and development'*, Working Paper No. 10, Commission on Growth and Development, The World Bank. Available at: http://documents.worldbank.org/curated/en/232971468326415075/The-role-of-institutions-in-growth-and-development (Accessed on 20 September 2017).

Acemoglu, D., Johnson, S. and Robinson, J. A. (2001) 'The Colonial Origins of Comparative Development: An Empirical Investigation', *The American Economic Review*, 91(5), pp. 1369-1401. Available at: http://www.jstor.org/stable/2677930 (Accessed: 21 December 2018).

Acemoglu, D., Johnson, S. and Robinson, J. A. (2005) 'Institutions as a Fundamental Cause of Long-Run Growth.' *Handbook of Economic Growth* 1A: pp. 386-472. Available at: https://scholar.harvard.edu/files/jrobinson/files/jr_institutionscause.pdf (Accessed: 19 December 2018).

Acemoglu, D and Robinson, J. (2004) '*The Role of Institutions in Growth and Development'*, The World Bank Working Paper No.10. Available at: https://siteresources.worldbank.org/EXTPREMNET/Resources/489960-1338997241035/Growth_Commission_Working_Paper_10_Role_Institutions_Growth_Development.pdf (Accessed: 21 December 2018).

Aghion P., and Howitt, P. (1998) *'Endogenous growth theory'*. MIT Press, Cambridge, MA: United States.

Ahmed, K., Mahalik, M. K. and Shahbaz, M. (2016) 'Dynamics between economic growth, labor, capital and natural resource abundance in Iran: An application of the combined cointegration approach', *Resources Policy*, 49(C), pp. 213-221. DOI:10.1016/j.resourpol.2016.06.005

Aidt, T.S. (2003) 'Economic analysis of corruption: a survey', *The Economic Journal*, 113(491), pp. F632–F652, DOI: 10.1046/j.0013-0133.2003.00171.x

Aidt, T.S., Dutta, J. and Sena, V. (2008) 'Governance Regimes, Corruption and Growth: Theory and Evidence', *Journal of Comparative Economics,* 36(2), pp. 195-220. DOI: 10.1016/j.jce.2007.11.004

Aiyar, S. and Feyrer, J, A (2002) '*Contribution to the Empirics of Total Factor Productivity*' Dartmouth College Working Paper No. 02-09. DOI:10.2139/ssrn.325363

Akinlo, A. and Adejumo, O. (2016) 'Determinants of Total Factor Productivity Growth in Nigeria, 1970–2009', *Global Business Review,* 17(2), pp. 257-270. DOI: 10.1177/0972150915619801

Alexeev, M. and Conrad, R. (2009) 'The elusive curse of oil', *Review of Economics and Statistics,* 91(3), pp. 586-598. DOI: 10.1162/rest.91.3.586

Alvi, S. and Ahmed, A. (2014) 'Analyzing the Impact of Health and Education on Total Factor Productivity: A Panel Data Approach, *Indian Economic Review,* 49(1), pp. 109-123. Available at: http://www.jstor.org/stable/24583409 (Accessed: 21 December 2018).

Appiah, E. (2017) 'The Effect of Education Expenditure on Per Capita GDP in Developing Countries', *International Journal of Economics and Finance Archives*, 9(10), pp. 136-144. DOI:10.5539/ijef.v9n10p136

Arezki, R. and Van der Ploeg, F. (2011) 'Do Natural Resources Depress Income Per Capita?', *Review of Development Economics,* 15(3), pp. 504–521.
DOI: 10.1111/j.1467-9361.2011.00623.x

Badeeb, R., Lean, H. and Clark, J. (2017) 'The evolution of the natural resource curse thesis: A critical literature survey', *Resources Policy,* 51(C), pp. 123-134. DOI:10.1016/j.resourpol.2016.10.015

Baland, J. M. and Francois, P. (2000) 'Rent-seeking and resource booms', *Journal of Development Economics,* 61(2), pp. 527–542. DOI: 10.1016/S0304-3878(00)00067-5

Bardhan, P. (1997) 'Corruption and Development: A Review of Issues', *Journal of Economic Literature,* 35(3), pp.1320-1346. Available at: https://www.jstor.org/stable/2729979 (Accessed: 2 November 2018)

Barrett, A. and O'Connell, P.J. (1999) 'Does Training Generally Work? The Returns to In-Company Training', *Industrial and Labor Relations Review,* 54(3), pp. 647-662. DOI: 10.2307/2695995

Bencivenga, V.R. and Smith, B.D. (1991) 'Financial intermediation and endogenous growth', *The Review of Economic Studies*, 58(2), pp. 195-209. DOI: 10.2307/2297964

Benhabib, J. and Spiegel, M. (1994) 'The role of human capital in economic development: Evidence from aggregate cross-country and regional US data', *Journal of Monetary Economics*, 34(2), pp. 143-173. DOI: 10.1016/0304-3932(94)90047-7

Ben-salha, O., Dachraoui, H. and Sebri, M. (2018) 'Natural resource rents and economic growth in the top resource-abundant countries: A PMG estimation', *Resources Policy,* DOI:10.1016/j.resourpol.2018.07.005

Boschini, A. D., Pettersson, J., and Roine, J. (2007) 'Resource Curse or Not: A Question of Appropriability', *The Scandinavian Journal of Economics*. 109 (3), pp. 593–617. DOI: 10.1111/j.1467-9442.2007.00509.x

Boschini, A. D., Pettersson, J., and Roine, J. (2013) 'The Resource Curse and its Potential Reversal', *World Development,* 43(C), pp. 19-41. DOI: 10.1016/j.worlddev.2012.10.007

Bravo-Ortega, C. and de Gregorio, J. (2005) '*The relative richness of the poor? natural resources, human capital, and economic growth',* Policy Research Working papers; no. WPS 3484. Washington, DC: World Bank. Available at: http://documents.worldbank.org/curated/en/618031468779383758/The-relative-richness-of-the-poor-natural-resources-human-capital-and-economic-growth (Accessed on 5 September 2017)

Busse, M. and Groning, S. (2013) 'The resource curse revisited: governance and natural resources', *Public Choice,* 154(1-2), pp 1–20. DOI: 10.2139/ssrn.1634963

Butkiewicz, J.L. and Yanikkaya, H. (2006) 'Institutional quality and economic growth: Maintenance of the rule of law or democratic institutions, or both?', *Economic Modelling,* 23(4), pp. 648-661. DOI: 10.1016/j.econmod.2006.03.004

Cameron G. (1998) 'Economic growth in the information age: From physical capital to weightless economy', *Journal of Informational Affairs*, 51(2), pp. 447–471. Available at: https://www.jstor.org/stable/24357508 (Accessed: 10 November 2018)

Caselli, F. (2005) 'Accounting for Cross-Country Income Differences', *Handbook of Economic Growth,* 1st edn, 1(A), pp.679-741. DOI:10.1016/S1574-0684(05)01009-9

Chimezie, N. B. and Prince O. N. (2016) 'Effects of Corruption on Educational System: A Focus on Private Secondary Schools in Nsukka Zone', *Global Journal of Human-Social Science: A Arts and Humanities – Psychology,* 16(5), Version 1.0. ISSN: 2249-460x

Ciccone, A. and Papaioannou, E. (2009) 'Human Capital, the Structure of Production, and Growth', *Review of Economics and Statistics,* 91(1), pp. 66-82. DOI: 10.1162/rest.91.1.66

Cockx, L. and Francken, N. (2016) 'Natural resources: a curse on education spending?', *Energy Policy,* 92(C), pp. 394-408. DOI: 10.1016/j.enpol.2016.02.027

Cole, M. A. and Neumayer, E. (2004) ‘The Impact of Poor Health on Total Factor Productivity’, *Journal of Development Studies*, 42(6), pp. 918–938. DOI: 10.1080/00220380600774681

Comin, D. (2017) ‘Total factor productivity’, *The New Palgrave Dictionary of Economics*, pp. 1-4, Palgrave Macmillan, UK. DOI 10.1057/978-1-349-95121-5_1681-2

Corden, W.M. (1984) ‘Booming Sector and Dutch Disease Economics: Survey and Consolidation’, *Oxford Economic Papers,* 36(3), pp. 359–380. DOI: 10.1093/oxfordjournals.oep.a041643.

Corden, W. M. and Neary, J. P. (1982) ‘Booming Sector and De-Industrialisation in a Small Open Economy’, *The Economic Journal*, 92(368), pp. 825-48. DOI: 10.2307/2232670

Dasgupta, P. and Ray, D. (1991) ‘Adapting to Undernourishment: The Biological Evidence and Its Implications’, in J. Dreze, and A. K. Sen (ed.), *The Political Economy of Hunger* Oxford: Clarendon Press.

Dasgupta, D., Keller, J. and Srinivasan, T.G. (2005) ‘*Reform and elusive growth in the Middle East - What has happened in the 1990s?’,* Middle East and North Africa Working Paper no. 25. Washington, D.C: The World Bank. Available at: http://documents.worldbank.org/curated/en/892651468776955775/Reform-and-elusive-growth-in-the-Middle-East-What-has-happened-in-the-1990s (Accessed: 10 December 2018).

Dias, J. and Tebaldi, E. (2012) ‘Institutions, human capital, and growth: The institutional mechanism’, *Structural Change and Economic Dynamics*, 23(3), pp. 300–312. DOI: 10.1016/j.strueco.2012.04.003

Dollar, D. and Kraay, A. (2001) ‘*Growth is good for the poor’*, Policy Research Working Paper No. 2587. Washington, DC: World Bank. DOI:10.1596/1813-9450-2587.

Easterly, W and Levine, R. (2001) ‘What have we learned from a decade of empirical research on growth? It's Not Factor Accumulation: Stylized Facts and Growth Models’, *The World Bank Economic Review*, 15(2), pp. 177–219. DOI:10.1093/wber/15.2.177

Easterly, W and Levine, R. (2003) ‘Tropics, germs, and crops: how endowments influence economic development’, *Journal of Monetary Economics,* 50(1), pp. 3-39. DOI:10.1016/S0304-3932(02)00200-3

Ehrlich, I and Lui, F.T. (1999) ‘Bureaucratic corruption and endogenous economic growth’, *Journal of Political Economy*,107(6), pp. S270-S293. DOI: 10.1086/250111

Elbadawi, I. A. and Soto, R. (2015) 'Resource rents, institutions, and violent civil conflicts', *Defence and Peace Economics*, 26(1), pp. 89-113. DOI: 10.1080/10242694.2013.848579

Farhadi, M., Islam,M. and Moslehi, S. (2015) 'Economic Freedom and Productivity Growth in Resource-rich Economies', *World Development,* 72(C), pp. 109-126. DOI: 10.1016/j.worlddev.2015.02.014

Faruq, H. and Taylor, A. (2011) 'Quality of Education, Economic Performance and Institutional Environment', *International Advances in Economic Research*, 17(2), pp. 224-235. DOI:10.1007/s11294-011-9293-4

Feenstra, Robert C., Robert Inklaar and Marcel P. Timmer (2015), 'The Next Generation of the Penn World Table', *American Economic Review*, 105(10), pp. 3150-3182. Available at www.ggdc.net/pwt

Fischer S. (1993) 'The role of macroeconomic factors in growth', *Journal of Monetary Economics,* 32(3), pp. 485–512. DOI: 10.3386/w4565

Gelb, A. (2010) *'Economic Diversification in Resource Rich Countries'*, Center for Global Development, International Monetary Fund, Washington, DC. This article is drawn from the author's lecture at a high-level seminar on *Natural resources, finance, and development: Confronting Old and New Challenges*, organized by the Central Bank of Algeria and the IMF Institute in Algiers, on 4-5 November 2010.

Gennaioli, N., LaPorta, R., Lopez-de-Silanes, F. and Shleifer, A. (2013) 'Human Capital and Regional Development', *The Quarterly Journal of Economics*, 128(1), pp. 105-164. DOI:10.1093/qje/qjs050.

Griliches, Z. (1992) 'The search for RandD spillovers', *Scandinavian Journal of Economics*, 94(0), pp. 29–47. DOI: 10.2307/3440244

Gyimah-Brempong, K. (2002). Corruption, economic growth, and income inequality in Africa, *Economics of Governance, 3(3),* 183–209. DOI: 10.1007/s101010200045

Gylfason, T. and Zoega, G. (2006) 'Natural Resources and Economic Growth: The Role of Investment' *World Economy,* 29(8), pp. 1091–1115. DOI: 10.1111/j.1467-9701.2006.00807.x

Haapanen, L. and Tapio, P. (2016) 'Economic growth as phenomenon, institution and ideology: a qualitative content analysis of the 21st century growth critique', *Journal of Cleaner Production*, 112(4), pp. 3492-3503. DOI: 10.1016/j.jclepro.2015.10.024

Hall, R. E. and Jones, C. I. (1999) 'Why do Some Countries Produce So Much More Output Per Worker than Others?', *The Quarterly Journal of Economics*,114(1), pp. 83-116. Available at: http://www.jstor.org/stable/2586948 (Accessed: 10 December 2018).

Hall B. and Kramarz F. (1998) 'Introduction: Effects of technology and innovation on firm performance, employment, and wages', *Economics of Innovation and New Technology*, 5(2–4), pp. 99–107. DOI:10.1080/10438599800000001

Hamdi, H. and Sbia, R. (2013a) 'The relationship between natural resources rents, trade openness and economic growth in Algeria', *Economics Bulletin*, 33(2), pp. 1649-1659. Available at: http://www.accessecon.com/Pubs/EB/2013/Volume33/EB-13-V33-I2-P154.pdf (Accessed: 10 April 2019).

Hamdi, H. and Sbia, R. (2013b) 'Dynamic relationships between oil revenues, government spending and economic growth in an oil dependent economy', *Economic Modelling*, 35(C), pp. 118-125. DOI: 10.1016/j.econmod.2013.06.043

Hassaballa, H. (2017) 'Studying the Effect of Corruption on Income Per-capita Level in an IV Estimation in Developing countries', *European Journal of Sustainable Development,* 6 (1), pp. 57-70. DOI: 10.14207/ejsd.2017.v6n1p57.

Herzfeld, T. and Weiss, C. (2003) 'Corruption and Legal (In) Effectiveness: An Empirical Investigation', *European Journal of Political Economy*, 19(3), pp. 621-632, DOI: 10.1016/S0176-2680(03)00018-1

Hsieh, C. and Klenow, P.J. (2007) 'Relative Prices and Relative Prosperity', American *Economic Review*, 97(3), pp. 562-585. DOI: 10.1257/aer.97.3.562

ICRG *International Country Risk Guide* (2017). Retrieved from https://epub.prsgroup.com/products/icrg

Igwike, R. S., Hussain, M.E. and Noman, A. (2012) 'The Impact of Corruption on Economic Development: A Panel Data Analysis', *SSRN Electronic Journal,* DOI:10.2139/ssrn.2003061

James, A. and Aadland, D. (2011) 'The curse of natural resources: an empirical investigation of US counties', *Resource and Energy Economics*, 33(2), pp. 440-453. DOI:10.1016/j.reseneeco.2010.05.006

Ji, K., Magnus, J.R. and Wang, W. (2014) 'Natural resources, institutional quality, and economic growth in China', *Environmental and Resource Economics*, 57(3), pp. 323-343. DOI 10.1007/s10640-013-9673-8

Julius A. Agbor, J. A. (2015) ‘Effects of Primary, Secondary and Tertiary Education on Conflict Intensity in Africa’, *Economies*, 3, pp. 161-185. DOI:10.3390/economies3040161

Klenow, P and Rodriguez-Clare, A. (1997) ‘The Neoclassical Revival in Growth Economics: Has It Gone Too Far?’, A chapter in *NBER Macroeconomics Annual,* 12, pp. 73-114. Available at: http://www.nber.org/chapters/c11037.pdf (Accessed: 10 April 2019).

Knack, S. and Keefer, P. (1995) ‘Institutions and economic performance: cross-country tests using alternative institutional measures’, *Economics and Politics,* 7(3), pp. 207-227. DOI: 10.1111/j.1468-0343.1995.tb00111.x

Knowles, S. and Owen, P. D. (1995) ‘Health capital and cross-country variation in income per capita in the Mankiw-Romer-Weil model’, *Economics Letters,* 48(1), pp. 99-106. DOI:10.1016/0165-1765(94)00577-O

Kumar, A. and Chen, W. (2013) ‘Health, education and the dynamics of cross-country productivity differences’, *Applied Economics Letters,* 20(12), pp. 1160-1164. DOI: 10.1080/13504851.2013.797549

Kumar, A. and Kober, B. (2012) ‘Urbanization, human capital, and cross-country productivity differences’, *Economics Letters,* 117(1), pp. 14-17. DOI: 10.1016/j.econlet.2012.04.072

Lambsdorff, J. G. (2002) ‘Corruption and Rent-Seeking’, *Public Choice*, 113(1-2), pp. 97–125. Available at: https://www.jstor.org/stable/30025775 (Accessed on 23 September 2017).

Lambsdorff, J. (2007) ‘*The institutional economics of corruption and reform: Theory, evidence, and policy’,* Cambridge University Press, UK.

Liberto, D. A., Pigliaru, F., and Chelucci, P. (2011) ‘International TFP Dynamics and Human Capital Stocks: A Panel Data Analysis, 1960-2003’, *The Review of Income and Wealth*, 57(1), pp.156-182. DOI: 10.1111/j.1475-4991.2010.00379.x

Loko, B. and Diouf, M. (2009) ‘*Revisiting the Determinants of Productivity Growth: What's New?'* IMF Working Paper No. 09/225. DOI: 10.5089/9781451873726.001

Lucas, R. E. (1990) ‘Why Does Capital Flow from Rich to Poor Countries?’ *American Economic Review,* 80(2), pp. 92-96. Available at: https://EconPapers.repec.org/RePEc:aea:aecrev:v:80:y:1990:i:2:p:92-96 (Accessed: 20 December 2018).

Mauro, P. (1995) ‘Corruption and Growth’, *The Quarterly Journal of Economics,* 110(3), pp. 681–712. DOI: 10.2307/2946696

Mauro, P. (1997) *'The Effects of Corruption on Growth, Investment, and Government Expenditure: A Cross-Country Analysis',* IMF Working Paper No. 96/98. Available at SSRN: https://ssrn.com/abstract=882994 (Accessed: 20 December 2018).

McDonald, S. and Roberts, J. (2002) 'Growth and multiple forms of human capital in an augmented Solow model: a panel data investigation', *Economics Letters,* 74(2), pp. 271-276. Available at: http://www.sciencedirect.com/science/article/pii/S0165-1765(01)00539-0 (Accessed: 20 January 2019).

Mehar, M. R., Hasan, A., Sheikh, M. A., and Adeeb, B. (2018) 'Total Natural Resources Rent Relation with Economic Growth: The Case of Pakistan and India', *European Journal of Economic and Business,* 3(3), pp. 14-22. Available at: http://lawarencepress.com/ojs/index.php/EJEB/article/view/538/960 (Accessed: 20 January 2019).

Mehlum, H., Moehne, K., and Torvik, R. (2006) 'Institutions and the Resource Curse', *The Economic Journal,* 116(508), pp. 1-20. DOI:10.1111/j.1468-0297.2006.01045.x

Mehlum, H., Moene, K., and Torvik, R. (2006) 'Cursed by Resources or Institutions?', *World Economy,* 29(8), pp. 1117–1131. DOI: 10.1111/j.1467-9701.2006.00808.x

Méon, P. and Sekkat, K. (2005) 'Does corruption grease or sand the wheels of growth?,' *Public Choice,*122(1), pp. 69-97. DOI: 10.1007/s11127-005-3988-0

Metz, H. C. (1993) '*Saudi Arabia: A Country Study*', Washington, D.C.: Federal Research Division, Library of Congress.

Miller S.M., and Upadhyay M.P. (2000) 'The effects of openness, trade orientation, and human capital on total factor productivity', *Journal of Development Economics,* 63(2), pp. 399–423. Available at: http://www.sciencedirect.com/science/article/pii/S0304-3878(00)00112-7 (Accessed: 20 January 2019).

Miller, S. M. and Upadhyay, M.P. (2002) '*Total Factor Productivity, Human Capital and Outward Orientation: Differences by Stage of Development and Geographic Regions',* Economics Working Papers No. 200233. Available at: http://digitalcommons.uconn.edu/econ_wpapers/200233 (Accessed: 20 January 2019).

Ministry of Commerce and Investment (2018). Saudi economy. Available at: https://www.mci.gov.sa/en/AboutKingdom/Pages/SaudiEconomy.aspx (Accessed on 18th Dec 2018).

Ministry of Economy and Planning. (2018). Saudi Arabia. Available at: http://www.saudinf.com/main/e1.htm (Accessed on 19th Dec 2018).

Mo, P. (2001) ‘Corruption and Economic Growth’, *Journal of Comparative Economics*, 29(1), pp. 66-79. DOI: 10.1006/jcec.2000.1703

Moradbeigi, M. and Law, S.H. (2017) ‘The role of financial development in the oil-growth nexus’, *Resources Policy,* 53(C), pp. 164-172. DOI: 10.1016/j.resourpol.2017.06.016

Mustapha, N. (2014) ‘The Impact of Corruption on GDP Per Capita’, *Journal of Eastern European and Central Asian Research,* 1(2), pp. 1-5. DOI: 10.15549/jeecar.v1i2.76

Nachega, J. C. and Fontaine, T. (2006) ‘*Economic growth and total factor productivity in Niger’,* IMF Working Papers 06/208, International Monetary Fund. Available at: DOI:10.5089/9781451864687.001

Nelson, R. and Phelps, E. (1966) ‘Investment in humans, technological diffusion, and economic growth’, *American Economic Review,* 56(1/2), pp. 69–75. Available at: https://www.jstor.org/stable/1821269 (Accessed: 21 January 2019).

Neumayer, E. (2004) ‘Does the “Resource Curse” Hold for Growth in Genuine Income as Well?’, *World Development,* 32(10), pp.1627–1640. DOI:10.1016/j.worlddev.2004.05.005

North, D. (1990) *‘Institutions, Institutional Change and Economic Performance’,* Cambridge University Press, UK.

Nurkse, R. (1953) ‘*Problems of capital formation in underdevelopment countries’,* Oxford: Basil Blackwell.

Okada, K. and Samreth, S. (2017) ‘Corruption and natural resource rents: evidence from quantile regression’, *Applied Economics Letters*, 24(20), pp. 1490-1493, DOI: 10.1080/13504851.2017.1287849

OPEC. (2018). OPEC Basket Price. Available at: https://www.opec.org/opec_web/en/about_us/169.htm [Accessed on: 12th Dec 2018].

Oyinlola, M.A., Adeniyi, O.A. and Raheem, I.D. (2015) ‘Natural resource abundance, institutions and economic growth in Africa’ *African J. of Economic and Sustainable Development,* 4(1), pp. 34-48. DOI:10.1504/AJESD.2015.068513

Paiders, J. (2008) ‘Relationship between corruption level changes and economic growth in the world end Europe’, *Proceedings of the International scientific conference: Research for Rural Development*. 14, Jelgava (Latvia), 21-23 May 2008.

Papyrakis, E. and Gerlagh, R. (2004) ‘The resource curse hypothesis and its transmission channels’, *Journal of Comparative Economics,* 32(1), pp.181-193. Available at: http://www.sciencedirect.com/science/article/pii/S0147-5967(03)00139-2 (Accessed: 19 January 2019).

Pattillo, C., Poirson, H. and Ricci, L. (2004) *'What Are the Channels through which External Debt Affects Growth',* IMF Working Paper WP 04/15/. DOI:10.5089/9781451843293.001

Perera, L. D. and Lee, G. H. (2013) 'Have Economic Growth and Institutional Quality Contributed to Poverty and Inequality Reduction in Asia?', *Journal of Asian Economics*, 27(X), pp. 71-86. DOI: 10.1016/j.asieco.2013.06.002.

Pesaran, H., Shin, Y., and Smith, R. J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships, *Journal of Applied Econometrics*, 16(3), 289-326. DOI: 10.1002/jae.616

Psacharopoulos, G. and Patrinos, H. (2004) 'Returns to Investment in Education: A Further Update', *Education Economics*, 12(2), pp. 111-134. DOI: 10.1080/0964529042000239140

Romer P. M. (1990) 'Endogenous technological change', *Journal of Political Economy*, 98(5), pp. 71–102. Available at: http://links.jstor.org/sici?sici=0022-3808%28199010%2998%3A5%3CS71%3AETC%3E2.0.CO%3B2-8andorigin=repec

Rose-Ackerman, S. (1999) *'Corruption and Government: Causes, Consequences, and Reform',* Cambridge University Press, UK.

Ross, M. (2015) 'What have we learned about the resource curse*?', Annual Review of Political Science*, 18(1), pp. 239-259. DOI:10.1146/annurev-polisci-052213-040359

Rostow, W.W. (1960). *The Stages of Economic Growth: A Non-Communist Manifesto*. Cambridge University Press, Cambridge.

Sachs, J. D. and Warner, A. M. (1995) *'Natural Resource Abundance and Economic Growth',* NBER Working Papers No. 5398, National Bureau of Economic Research. Cambridge, MA. Available at SSRN: https://ssrn.com/abstract=225459 (Accessed: 9 October 2018)

Sachs, J. D. and Warner, A. M. (1997) 'Sources of Slow Growth in African Economies', *Journal of African Economies*, 6(3), pp. 335-376. DOI: 10.1093/oxfordjournals.jae.a020932

Sachs, J. D. and Warner, A. M. (1999) 'The big push, natural resource booms and growth', *Journal of Development Economics,* 59(1), pp. 43-76. DOI:10.1016/S0304-3878(99)00005-X

Sachs, J. D. and Warner, A. M. (2001) 'The curse of natural resources', *European Economic Review,* 45(4-6), pp. 827-838. Available at: http://www.sciencedirect.com/science/article/pii/S0014-2921(01)00125-8 (Accessed: 9 June 2018).

Sala-i-Martin (1997) ‘I just ran two million regressions’, *The American Economic Review,* 87(2), pp.178-183. Available at: https://www.jstor.org/stable/2950909 (Accessed: 20 October 2018).

Sala-I-Martin, X., Doppelhofer, G. and Miller R.I. *(*2004) *‘*Determinants of Long-Term Growth: A Bayesian Averaging of Classical Estimates (BACE) Approach’, *American Economic Review,* 94 (4), pp. 813-835. DOI: 10.1257/0002828042002570

Satti, S.L., Farooq, A., Loganathan, N. and Shahbaz, M. (2014) ‘Empirical evidence on the resource curse hypothesis in oil abundant economy’, *Economic Modelling,* 42(C), pp. 421–429. DOI: 10.1016/j.econmod.2014.07.020

Shahbaz, M., Destek, M. A., Okumus, I. and Sinha, A. (2019) ‘An empirical note on comparison between resource abundance and resource dependence in resource abundant countries’ *Resources Policy,* 60(C), pp. 47-55. DOI:10.1016/j.resourpol.2018.12.002

Shahbaz, M., Naeem, M., Ahad, M. and Tahir, I. (2018) ‘Is natural resource abundance a stimulus for financial development in the USA?’, *Resources Policy,* 55(C), pp. 223-232. DOI:10.1016/j.resourpol.2017.12.006

Singer, H. (1950) ‘The Distribution of Gains Between Investing and Borrowing Countries’, *American Economic Review, Papers and Proceedings.* 40 (2), pp. 473-485. DOI: 10.1007/978-1-349-04228-9_3

Singh, S. R. (2008) ‘A computational method of forecasting based on fuzzy time series’, *Mathematics and Computers in Simulation,* 79(3), pp. 539-554 DOI:10.1016/j.matcom.2008.02.026

Smith, R. (2015) ‘Educational research: The importance of the humanities’, *Educational Theory, 65*(6), pp. 739–754. DOI: 10.1111/edth.12145

Solow, R. M. (1956) ‘A Contribution to the Theory of Economic Growth’, *Quarterly Journal of Economics,* 70(1), pp. 65-94. DOI: 10.2307/1884513

Solow, R. M. (1957) ‘Technical Change and the Aggregate Production Function’, *The Review of Economics and Statistics,* 39(3), pp. 312-320. DOI:10.2307/1926047

Stevens, P. and Dietsche, E. (2008) ‘Resource Curse: An Analysis of Causes, Experiences and Possible Ways Forward’, *Energy Policy,* 36(1), pp. 56–65. DOI:10.1016/j.enpol.2007.10.003

Stoian, C. and Filippaios, F. (2007) ‘Foreign Direct Investment in Central, Eastern and South Eastern Europe: An ‘Eclectic’ Approach to Greek Investments’, *International Journal of*

*Entrepreneurship and Innovation Management,* 8(5), pp.542-564. DOI:10.1504/IJEIM.2008.022320

Taguchi, H. and Lar, N. (2016) 'The resource curse hypothesis revisited: evidence from Asian economies', *Bulletin of Applied Economics,* 3 (2), pp. 31-42. Available at: http://www.riskmarket.co.uk/bae/journals-articles/issues/the-resource-curse-hypothesis-revisited-evidence-from-asian-economies/?download=attachment.pdf (Accessed: 11 October 2018).

Tanzi, V. and Davoodi, H. (1997) *'Corruption, Public Investment, and Growth',* IMF Working Paper No. 97/139. DOI: 10.5089/9781451929515.001

Tebaldi, E. (2016) 'The Dynamics of Total Factor Productivity and Institutions', *Journal of Economic Development*, 41(4), pp.1-25. Available at: http://jed.or.kr/full-text/41-4/1.pdf (Accessed: 15 April 2019).

Tebaldi, E. and Elmslie, B. (2013) 'Does institutional quality impact innovation? Evidence from cross-country patent grant data', *Applied Economics*, 45(7), pp. 887-900. DOI: 10.1080/00036846.2011.613777

Thyne, C.L. (2006) 'ABC's, 123's, and the Golden Rule: The Pacifying Effect of Education on Civil War, 1980–1999', *International Studies Quarterly*, 50(4), pp. 733–754. DOI: 10.1111/j.1468-2478.2006.00423.x

Ubi, P. and Udah, E. B. (2014) 'Corruption, Institutional Quality and Economic Performance in an Emerging Economy: Lessons from Nigeria', *British Journal of Economics, Management and Trade,* 4(11), pp. 1708-1722. DOI: 10.9734/BJEMT/2014/11091

Ugur, M. (2014) 'Corruption's direct effects on per-capita income growth: A meta-analysis', *Journal of Economic Surveys,* 28(3), pp. 472-490. DOI:10.1111/joes.12035

Urdal, H. (2008) 'Population, Resources, and Political Violence: A Subnational Study of India, 1956–2002', *Journal of Conflict Resolution,* 52(4), DOI: 10.1177/0022002708316741

World Bank. World Development Indicators (2017). Retrieved from: www.data.worldbank.org.

## Appendix 1
## Impact of Resource Rents on Per Capita GDP

**Figure A1: CUSUM Stability Test**

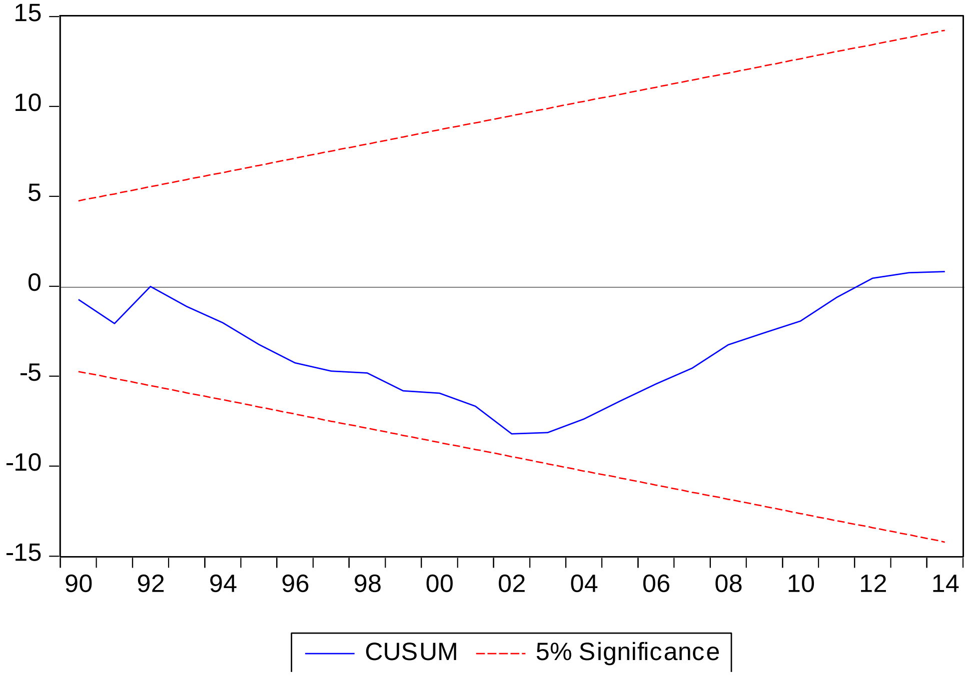
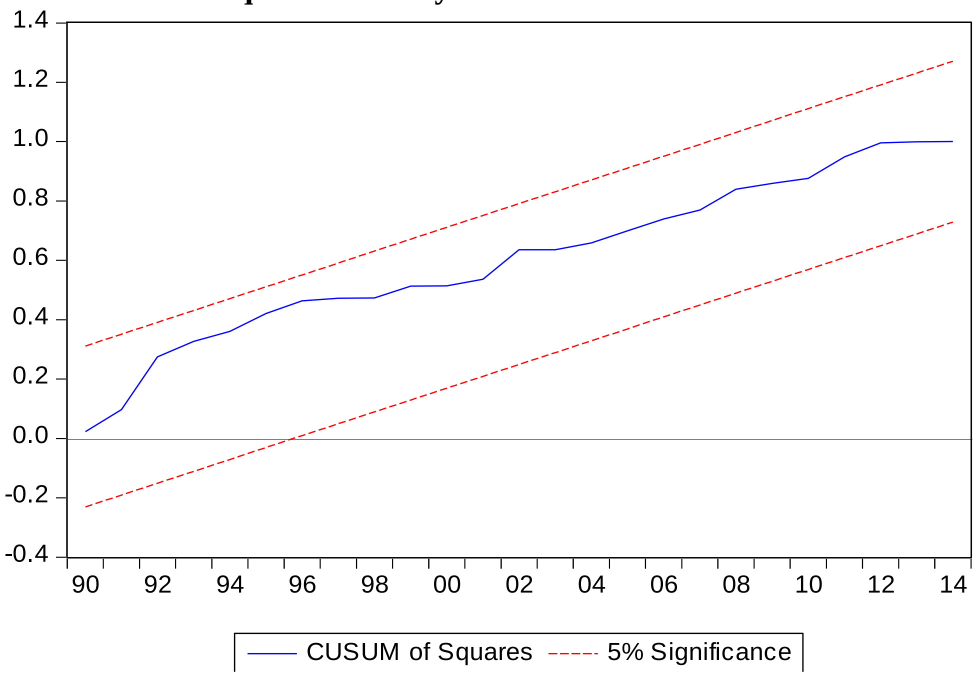



**Figure A2: CUSUM of Squares Stability Test**



## Impact of Resource Rents on Total factor productivity

**Figure A3: CUSUM Stability Test**

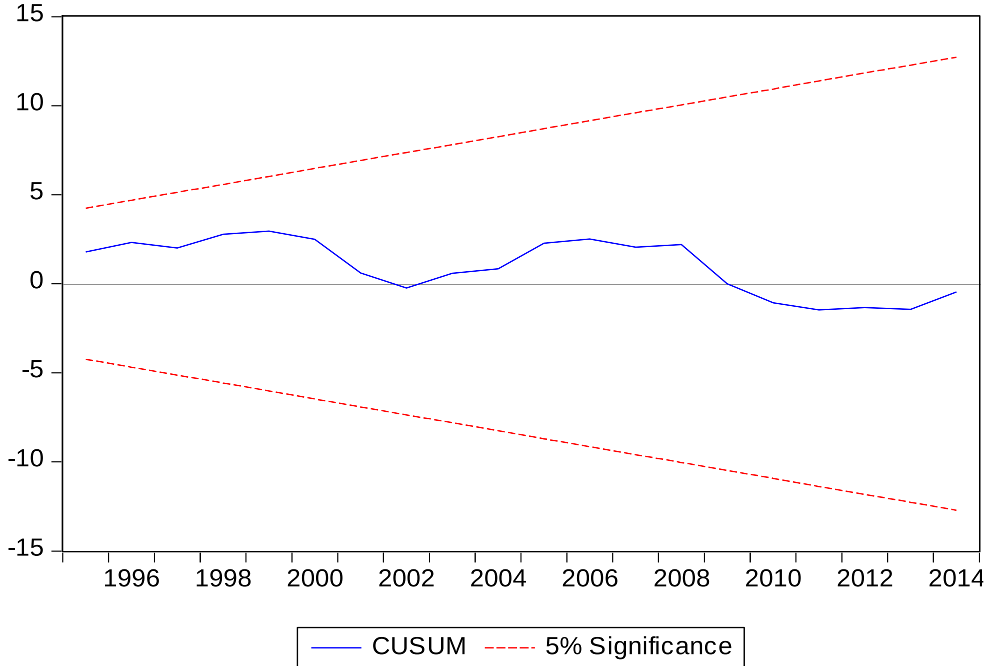



**Figure A4: CUSUM of Squares Stability Test**