THE UNIVERSITY OF HULL

FOREIGN DIRECT INVESTMENTS AND NATURAL RESOURCES

An empirical study on the Gulf Co-operation Council (GCC)

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Abstract

Foreign direct investment (FDI) is a key source of technology transfer, economic growth and development, but many resource-rich economies attract less FDI compared to resource-poor countries. In light of this, it is surprising that there are very few studies available on the effects of natural resources on both the composition and volume of FDI. This thesis investigates the impacts and determinants of sectoral FDI in oil-exporting and producing economies of the Gulf Cooperation Council (GCC), using three empirical papers and considering several aspects.

The thesis starts by investigating the impacts of natural resource abundance (oil) on the behaviour of FDI inflows to GCC countries, utilising two different data sets and different estimators to control for the issue of endogeneity. The empirical findings show that natural resources decrease aggregate inflows of FDI to GCC economies. More specifically, the resource sector (oil) attracts more FDI inflows but deters FDI to the non-resource sector. These results confirm the so-called *FDI-Natural resource curse,* through crowding out effect.

This thesis also examines the relationship between aggregate FDI and sectoral FDI (resource and non-resource) inflows on economic growth, using a unique data set on sector-level FDI developed by the Financial Times: *fDi* market. The empirical results indicate a negative relationship between total FDI inflows and GDP per capita growth in the GCC economies. Moreover, two-sector analysis (resource and non-resource) shows that resource-based FDI hinders economic growth and non-resource FDI has insignificant effects on GDP per capita growth. This gives an indicator of the presence of the *natural resource curse* via the FDI channel.

Finally, the third chapter of this thesis explores the effects of total FDI (inflows and outflows) and sectoral FDI inflows on public and private domestic investments in GCC countries. Aggregate estimations show that FDI inflows contribute significantly to public domestic investment but discourage private domestic investments. Also, FDI outflows promote private domestic economic activities, while in contrast, they negatively affect public domestic investment. Disaggregate data shows that greenfield FDI inflows to the oil sector yield a significant and positive effect on public domestic investment. Non-oil FDI has an ambiguous effect on domestic investment.

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Declaration

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Chapter 1 Introduction and Overview

1.1. Introduction

Foreign Direct Investment (FDI) is one of the main shapes of the liberalisation of capital flows and has an important role in promoting globalisation (Soubbotina, 2004). The significance of multinational corporations (MNCs) lies in two key aspects: the proportion of FDI inflows in total capital flows and its positive spill-overs on the host countries. FDI inflows stood for about 50 percent of total cross-border investments in developing economies during the 1990s and 2000s, and constituted roughly 40 percent of cross-border investments in emerging countries in the same period (Ahmed, 2016; IMF, 2011). Further, FDI was the key source of external finance in most deficit economies.

However, estimating the impacts of FDI on the host country is the main challenge that has vexed economists and policymakers. The effect of FDI varies across countries as well as sectors. Therefore, it is difficult to estimate and generalise its consequences. These impacts depend on the development of the host country, the availability of good financial markets, human capital and the quality of institutions.

Natural resources were originally considered valuable assets, which attracted foreign firms with capital and advanced technologies to invest in these extractive industries. Based on this, asset/rent-seeking FDI emerged. Oil-exporting countries (resource-rich economies) attract a significant volume of FDI inflows. According to UNCTAD (United Nations Conference on Trade and Development), oil-rich countries absorbed about 31 percent of global FDI inwards during 1970-2014. Despite this significant inflow, these countries still face some challenges in terms of the influence of these FDI.

Based on the rentier state theory, oil-rich economies, and in particular developing countries, tend to suffer from certain economic, political and social problems that affect FDI behaviour. The major challenge is the resource curse[1] in the attraction of FDI through the distribution of FDI (Beblawi, 1987). Recent empirical studies have noted that resource-poor economies attract more FDI inflows than resource-rich countries (Poelhekke & van der Ploeg, 2013). Further, non-rentier states received 24.3 percent of global FDI compared with about 8 percent for rentier states (Ahmed, 2016; World Bank, 2014).

Despite growing concerns, research is lacking on the FDI-natural resource relationship. Regrettably, most previous empirical and theoretical works focus on spillover impacts in the manufacturing industry (Atikten and Harrison, 1999). Asiedu (2006) states that "*FDI[s] in resource-rich countries are concentrated in natural resources, and investments in such industries tend not to generate the positive spillovers (e.g. technological transfers, employment creation) that are often associated with FDI*" (p.64). In this sense, non-resource sectors such as manufacturing and services will not gain positive externalities.

The Gulf Cooperation Council (hereafter, the GCC) was among the most attractive destinations for foreign firms. During the boom in oil prices of 2002-2008, there was significant interest among foreign investors in accessing the Gulf market. Indeed, FDI inflows to GCC multiplied by over 150 times between 2000 and 2010 (MENA-OECD, 2011). FDI volumes intrinsically are not the issue; the most important matter is the distribution of these inflows. More than half of FDI in GCC countries centred on the oil sector during the period 2003-2013 (fDI Intelligence, 2015).

[1] The term natural resource curse describes the negative relationship between natural resources and economic growth.

Consequently, an investigation into the FDI-natural resources association is urgently needed in the literature. The impacts of natural resources on economic development were called into question by Sachs and Warner (1997, 2001). This relationship was described later as the natural resource curse.

The above statistics may raise a critical question about the quality of FDI in the GCC economies and its effects on both the economic growth and domestic investment "spillovers" of these FDI inflows.

From the previous debate, several hypotheses will be tested in this thesis, as follows; Hypothesis 1: natural resources (measured by oil rents and oil GDP) attract more FDI in the resource sector and deter the non-resource FDI inflows; hypothesis 2: resource-based FDI hampers economic growth in the GCC economies and crowds out the positive effects of non-resource FDI inflows; and finally, hypothesis 3: FDI in the oil sector promotes public domestic investment and hinders private domestic investment in the GCC region.

Unlike previously published papers, which mostly adopt an aggregated level of FDI inflows, this thesis seeks to provide new empirical evidence using a sector-level data set of FDI inflows. The findings indicate that natural resource abundance attracts more FDI in the resource sector, but crowds out non-resource FDI in GCC economies. Further, resource-related FDI negatively affects economic growth, which gives support for the natural resource curse hypothesis. Also, this study found that the concentration of FDI inflows in the resource sector deters private domestic investment in the GCC economies, which complicates the diversification policy in this region.

This study contributes to the ongoing literature in three aspects. Firstly, there is a contribution related to the natural resource curse literature by investigating the impacts of natural resources on total and sectoral FDI from one side, and the impacts of FDI in resource and non-resource sectors on economic growth and domestic investments from

the other side. Secondly, it provides more understanding of the determinants of FDI inflows and the impacts on economic growth and domestic investment. Thirdly, this study, to the best of the author's knowledge, is the first empirical work investigating sectoral FDI determinants and impacts in the GCC area.

The overall structure of the thesis takes the form of five chapters, including this introduction. Chapter 2 presents the literature review in three main sections. The first section critically reviews previous studies on the natural resource curse, which focuses on the role of FDI, while the second presents a review of the literature on the FDI-economic growth relationship. Finally, Section 3 is devoted to the impacts of FDI inflows on domestic investment. Chapter 3 provides the methodology used in this study, while Chapter 4 presents the results of the three empirical papers. In the final chapter, a summary of the empirical findings, research limitations and future work are presented.

1.2. FDI trend: An overview

In recent years, there has been widespread agreement that FDI is one of the important drivers of economic growth for both developed and developing countries. Furthermore, FDI inflows and outflows have witnessed a staggering increase because of an open-door policy. This section provides an overview of selected indicators related to FDI development, across the world, in the Middle East and North Africa (hereafter MENA) region, and specifically in the GCC economies.

1.2.1. FDI trend: Global FDI

FDI (inwards and outwards) in the developed economies witnessed a significant increase during the period 1980-2013. FDI inflows in developed economies increased from $8.4 billion in 1980 to $135.8 billion in 2013, which represents between 5 percent and 36.34 percent of their GDP respectively. Also, it is noticed from Table 1 that developed countries absorbed more than 50 percent of world FDI inflows. Additionally, FDI

outflows from developed countries increased from $10.07 billion to $175.7 billion between 1980 and 2013. Again, most of these outflows came from developed areas, constituting more than 90 percent of world FDI outflows in 1990 and about 79 percent of total world outward FDI in 2013. From Table 1, it is also noticed that FDI outflows significantly declined in the 1990s, and specifically in Asian economies because of the Asian financial crises during this period. These outflows went up sharply after the year 2000, closely following the 1997~1998 Asian financial crisis (Bano & Tabbada, 2015).

The majority of FDI outflows are concentrated in the developed economies, but do not flow to developing countries as expected. This trend of FDI that does not flow from rich to developing countries is called the Lucas Paradox (Lucas, 1990). It occurs partly because developing economies have a low level of capital per worker. Likewise, developing countries are characterized by low levels of technologies, weak institutions and a high level of political instability. Another issue that increases uncertainty in these countries and hinders FDI inflows is international capital market imperfection: mainly the risk of nationalization (sovereign risk) and asymmetric information (Alfaro, Kalemli-Ozcan, & Volosovych, 2008).

For developing economies, FDI also has seen significant growth in both dimensions, inflows and outflows. FDI inflows grew from $4.27 billion in 1980 to $53.0 billion in 2013. Their share in global FDI, however, is low compared with developed countries. FDI outflows accounted for between 12 percent and 18.97 percent of world outwards FDI between 1980 and 2013, and 2.8 percent and 18.5 percent of GDP in these economies.

More importantly, in 1980, for the first time, developing economies alone absorbed about 42 percent of global FDI inflows, which then decreased to 33.31 percent of total FDI. Among these developing countries, Asia was the most attractive destination for inflows

of FDI, followed by America. This shows the solid position of Asian economies as an attractive area for multinational corporations, as shown in Table 1.

Table 1. Global FDI trends in the world (1980-2013)

	1980	1990	2000	2010	2013	1980	1990	2000	2010	2013
FDI inflows percent of GDP						FDI outflows percent of GDP				
Developed	4.77	8.8	22.39	31.68	36.34	5.67	10.97	27.98	42.28	47.01
Developing	11.45	13.12	25.05	31.3	30.95	2.8	3.67	12.74	16.83	18.53
FDI inflows percent of FDI world						FDI outflows percent of FDI world				
Developed	57.54	75.21	75.64	64	63.04	87.04	93.38	88.65	81.73	78.91
Developing	42.45	24.71	23.58	32.38	33.31	12.95	6.7	11.08	18.17	18.97
Asia	30.41	16.34	14.75	19.51	20.42	3.02	3.2	8.15	11.63	13.35
America	5.98	5.35	6.75	9.86	10.88	8.53	2.56	2.43	4.1	4.98
Real FDI inflows in Millions, US dollars						Real FDI outflows in Millions, US dollars				
Developed	8476.7	21100	69577.7	113829	135898	10071.6	26298.1	86945.4	1518876	175781.6
Developing	4275.5	6893.3	21090.1	46338	53022.6	1024.5	1890.8	10569.9	24483.1	31210.6

Source: UNCTAD statistics, 2018

In terms of FDI distribution, Figure 1 and Figure 2 show that there is considerable variation in the FDI by sector, across mining, manufacturing and services. It is noticed that the service sector is the most attractive sector for foreign investors, constituting more than 80 percent of FDI inflows in the world from 2003-2014. Meanwhile, the mining sector- which includes the oil and gas industries- witnessed a sharp decline in particular after 2009 because of oil price decline and volatility. This kind of FDI accounted for about 22 percent of the total, with 200,000 million dollars of absolute investment. The manufacturing sector comes in second place in the FDI list, with about 60 percent of total FDI inflows in the world (UNCTAD, 2015).

Figure 1. The distribution of FDI inflows globally as a share of global FDI (2003-2014)

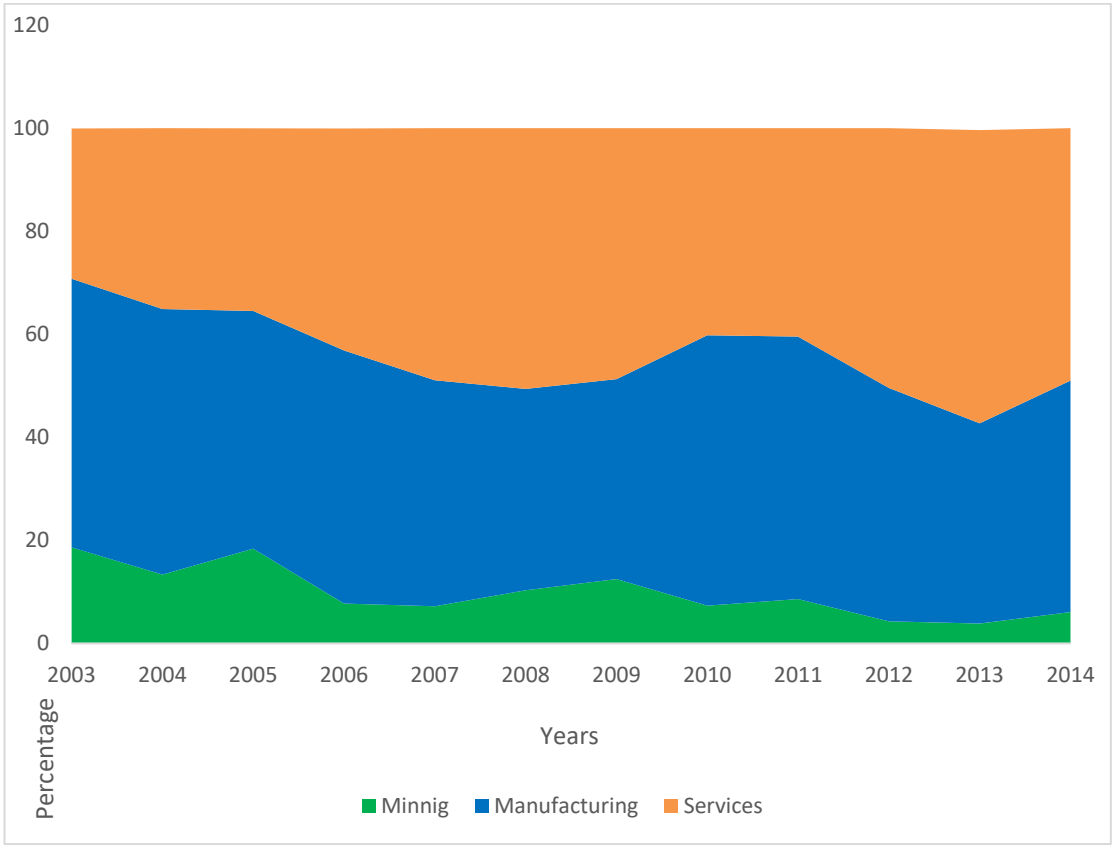
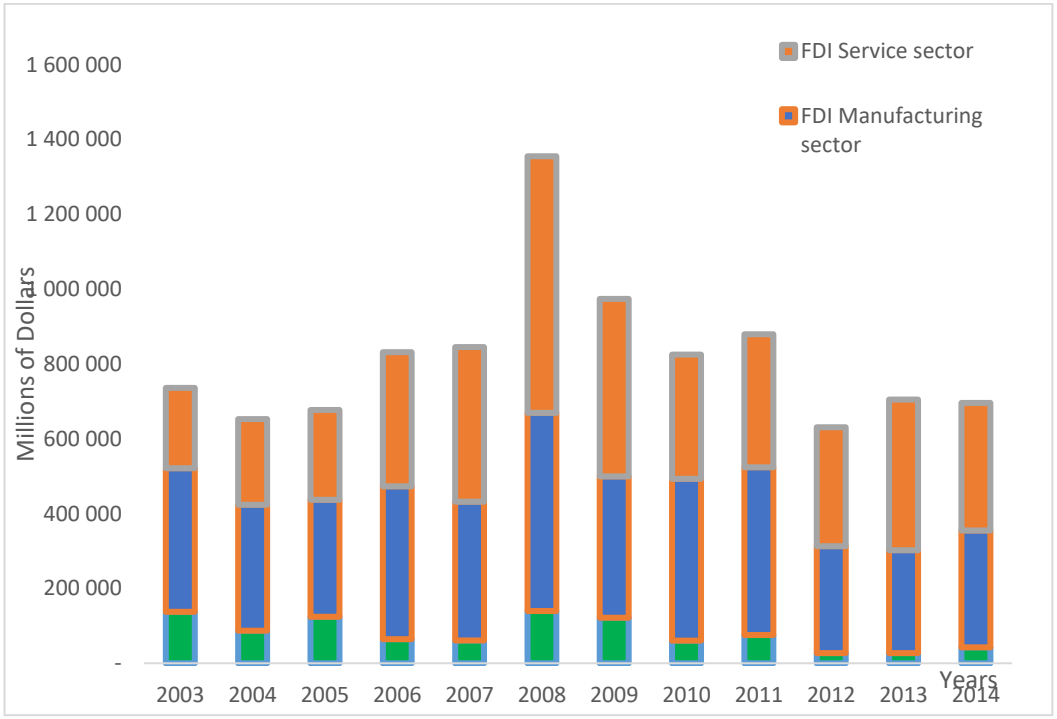


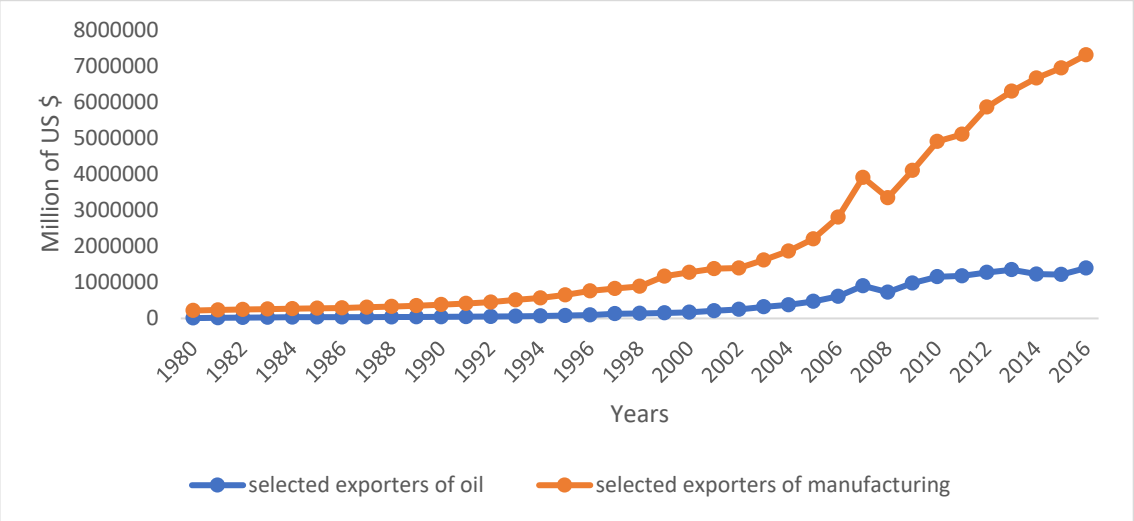
Figure 2. The distribution of FDI inflows globally (2003-2014) in absolute values



Source: Author's work, based on UNCTAD statistics (2018)

Considering the FDI inflows in resource-rich and resource-poor economies, Figure 3 illustrates the point that FDI inflows "as an absolute value" flow more to manufacturing-exporters' economies than to oil-exporter countries. This gap gives an indicator of the hypothesis that resource-rich economies attract less FDI than resource-poor countries (Poelhekke & Van der Ploeg, 2010; 2013).

Figure 3. FDI inflows to oil-rich and oil-poor economies (1980-2016)



Source: Author's work, based on data from UNCTAD statistics (2018)

1.2.2. FDI trends in MENA and GCC countries 1980-2013

Middle East North Africa (hereafter MENA) countries have witnessed volatility in FDI inflows, and this trend is associated with several factors, based on the characteristics of each economy for these countries. MENA countries are heterogeneous, with a group being natural resource-rich economies (oil and gas): GCC and OPEC countries; while others are natural resource-poor countries and depend mainly on the tourism sector. Therefore, foreign investors have different motivations to direct their investment in this area.

It is noticeable that there was a dramatic change in FDI inflows to this region after 2000. FDI inflows increased sharply during the period 2000-2007, to reach $126 billion. This

growth occurred because of open-door policies in these countries towards foreign investments, with the objective of filling gaps in finance of selected mega-projects, and benefiting from advanced technologies. However, between 2008 and 2013, FDI inflows to Arab countries in transition (Arab Spring area) decreased by an average of 45 percent, whereas inflows shrank by an average of 61 percent in GCC countries (Lesser & Stolle, 2014). This significant decline came because of administrative obstacles, accompanied by the financial crisis. Also, the political instability in this region after the 2010 "Arab Spring" increased the level of uncertainty, which led to low levels of investment (Burger, Ianchovichina, & Rijkers, 2013; Lesser & Stolle, 2014).

Concerning the distribution of these inflows of FDI, most foreign investments were concentrated in the extractive sector, which is oil and gas. In 2013, the resource sector (coal, oil and gas) absorbed more than 50 percent of foreign capital. Table 2 offers information about the distribution of FDI inflows to the MENA region. Obviously, during the period 2003-2013, the resources sector was the leading sector, receiving about 70 percent of total Greenfield FDI inflows. After the "Arab Spring" in 2011, foreign investors further directed their investment more towards the oil sector.

Table 2. Sources of Greenfield FDI and distribution in MENA economies 2003-2013

Sector / Source of FDI	Resource and oil industry	Percentage of total resource-FDI inflows	Non-oil industry	Percentage of total nonresource-FDI inflows
Developed countries (strong institutions and R&D)	172.1	86.00	78.2	86.31
Other developed countries	28	13.99	12.4	30.6
Total	200.1	100	90.6	100

Source: Elbadawi & Selim (2016)

1.3. Diversification experience in the GCC: Abu Dhabi-UAE

The biggest emirate of the United Arab Emirates (UAE), Abu Dhabi provides more than 50 percent of national GDP, because it contains more than 90 percent of the country's oil reserves. To decrease the negative impacts of oil price volatility and improve levels of sustainable economic growth, the UAE government adopted a new policy to diversify the Abu Dhabi economy. In doing so, they focused on inward foreign investment as the key tool to achieve this target.

Therefore, Abu Dhabi launched a long-term strategy for economic diversification – *The Abu Dhabi Economic Vision 2030 Strategy* –, which has seen the Emirate committed to changing its resource-oriented economy into a knowledge-based economy. The *2030* plan aims to increase the proportion of non-oil GDP, presently accounting for 54 percent, to reach 60 percent by 2030. The emirate's main non-oil sectors include construction, manufacturing, finance, retail and the wholesale trade.

As part of its diversification policy, Abu Dhabi has placed a priority on high value-added industries through FDI inflows. One of the main FDI policies is providing an essentially tax-free jurisdiction, through which foreign companies in Abu Dhabi can benefit from the advantage of open and unrestricted free repatriation of capital and profit.

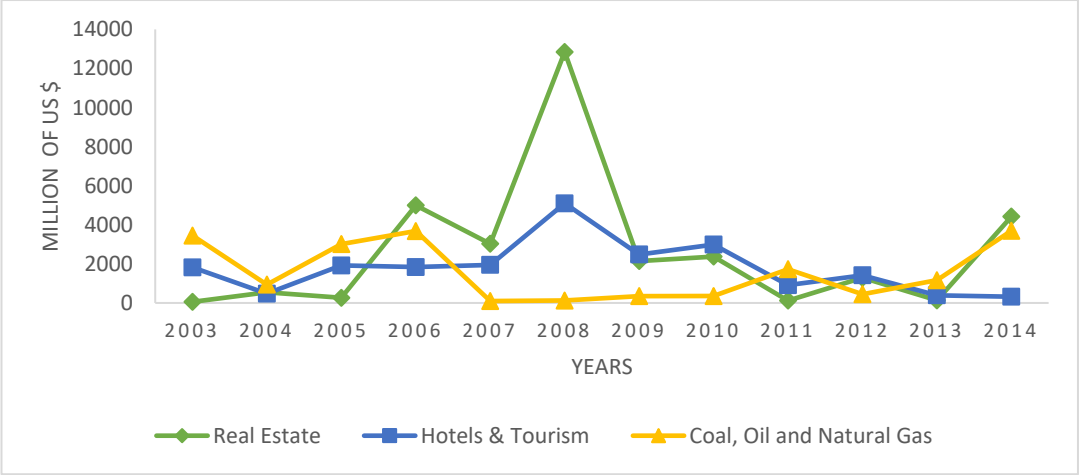
To give greater incentives and motivation for foreign firms, Abu Dhabi has also established some free zones, as well as advanced infrastructure and business-friendly institutions and regulations. Corporations centred in these free zones, for example, can be 100 percent foreign-owned and exempt from import or re-export taxes. In addition, there are no restrictions on employing foreign workers.

The FDI inflows to the UAE increased significantly from 2003-2013. After launching its vision for 2030, the main driver of this investment was the real state sector. In this sector, investments jumped from $ 263.3 million in 2005 to reach about $ 12.847.15 million in

2008, at about a 164.3 percent growth rate. This investment dropped because of the 2007-2008 financial crisis. After the recovery from this financial crisis, real estate-FDI increased significantly, from $ 132.4 million to $ 4420.4 million during 2013 and 2014 (see Figure 4).

The hotel and tourism industry comes in second place as an FDI destination, and the FDI trend in this sector is quite stable. This sector is attractive for foreign firms because of the significant number of tourists visiting the UAE. Oil and natural gas ranked third place as an attractive sector for FDI inflows. FDI inflows to this sector have experienced high volatility following fluctuations in oil price.

Figure 4. The distribution of FDI inflow in the UAE from 2003-2013



Source: Author's work, based on fDi intelligence, Financial Times data.

1.4. Natural resource indicators in the GCC

It is very important to distinguish between two main concepts related to natural resource literature: natural resource abundance and natural resource dependence. Resource abundance refers to countries that do not rely largely on their resource revenues to administrate their economy, because they have large manufacturing and service sectors. Examples include Norway, Canada, the US and Australia. James (2015) argues that abundant resource countries enjoy a high reserve of natural resources with a lesser share

of resource export in GDP. Therefore, underground resource assets can be measured by natural resource rents and natural resource reserves.

Resource-dependent countries, however, are defined as countries that depend on their resource sector to manage economic growth and income: in other words, countries where the current level of consumption relies mainly on resource production and exportation such as oil-producing developing countries. Kropf (2010) states that dependency on resources makes countries likely to be non-developed.

On the contrary, the resource curse is less adverse in abundant resource countries. This section gives an overview of resource abundance indicators (oil-gas reserves, production and oil rents) and resource dependence (structure of exports). This section illustrates some indicators related to these two dimensions: resource abundance; and resource dependence in GCC economies.

1.4.1. Resource abundance indicators in GCC economies

In terms of natural resource endowment, the GCC region is one of the most abundant economies in the world. This abundance creates higher rents and puts states in this region into the ranks of high-level income countries.

- **Oil-gas reserves and production in GCC**

The GCC economies together stood for around 29 percent of global oil reserves in 2017. Saudi Arabia alone accounted for 15.43 percent of total proven oil reserves, ranking as the second-largest oilfield reserves, behind Venezuela (21 percent of the total). Because of this huge amount of reserves, Saudi Arabia can increase its supply to the oil market in the short term and account for 50 percent of total spare production capacity. With this ability, Saudi Arabia can increase oil production by more than 2 percent within a month

(Elbadawi & Selim, 2016). Behind Iran and Iraq, Kuwait and the UAE together hold more than 10 percent of global reserves of oil (see Table 3).

Table 3. Oil reserves and production in 2017 (million barrels)

Country	Oil reserves	Share of the total (percent)	Rank	Oil production	Share of total
GCC economies					
Saudi Arabia	266455	15.43	2	11951000	12.9
Kuwait	101500	5.88	6	3025000	3.27
UAE	97806	5.66	7	3935000	4.25
Qatar	25244	1.46	14	1916000	2.07
Oman	5373	0.31	22	971000	1.05
Bahrain	125	0.01	66	50000	0.05
Other economies					
Venezuela	360878	20.9	1	2110000	2.28
Iran	158400	9.17	4	4982000	5.38
Iraq	142503	8.25	5	4520000	4.88
Russia	80000	4.63	8	11257000	12.15
Total for the world	1726685	100		92649000	100

Source: U.S. Energy Information Administration, International Energy Statistics, crude oil including lease condensate, accessed 16 July 2018.

Moving to oil production, the GCC economies produce a huge amount of oil. Saudi Arabia controls around 13 percent of world oil production, and the UAE comes in second place with 4 percent, followed by Kuwait at 3.27 percent. This production capacity gives Saudi Arabia in particular and the GCC in general a significant role in OPEC decisions.

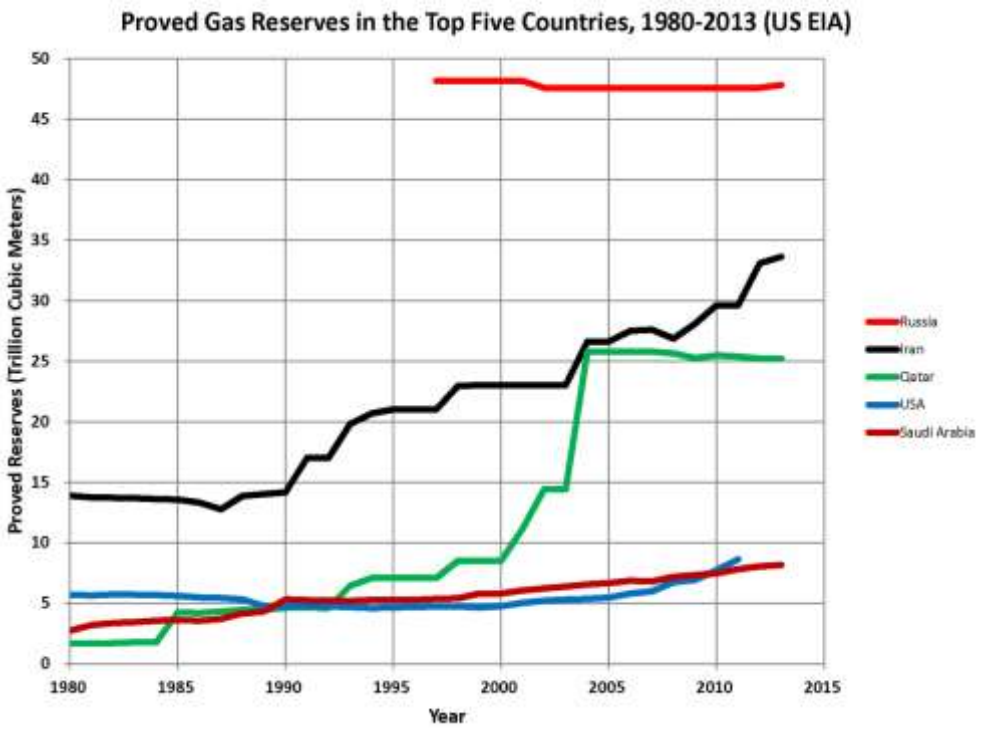
Turning to the natural gas industry, Qatar ranked as the third largest country for gas reserves in the world, being responsible for 12 percent of total gas reserves, after the Russian economy (23.28 percent) and Iran (16.57 percent). Qatari gas reserves have been driven since 2000 by a significant discovery, and have made the Qatari economy one of the world's fastest-growing and highest per capita income countries. Table 4 and Figure 5 give further details.

Table 4. Gas reserves in 2017 (million cubic meters)

Country	Gas reserves	Share of total	Rank
GGC region			
Saudi Arabia	8489000	4.13	5
Kuwait	1784000	0.87	21
UAE	6091000	2.97	7
Qatar	24530000	11.95	3
Oman	849500	0.41	28
Bahrain	92030	0.04	57
Other countries			
Venezuela	5617000	2.74	8
Iran	34020000	16.57	2
Iraq	3158000	1.54	12
Russia	47800000	23.28	1
Total of the world	2.05E+08	100	

Source: U.S. Energy Information Administration, International Energy Statistics, crude oil including lease condensate, accessed 16 July 2018.

Figure 5. Proven gas reserves in the top five countries



Source: U.S. Energy Information Administration, International Energy Statistics, crude oil including lease condensate, accessed 16 July 2018.

- **Oil rents**

Natural resource rents to GDP ratio fluctuated in GCC economies on average by about 30.33 percent from 1980-2015. Kuwait, Oman and Saudi Arabia are considered richer, with oil rents standing for almost half of GDP. On the other hand, Bahrain and UAE are relatively less abundant, with 6 percent and 22 percent of GDP respectively. See Table 5.

Consequently, GCC economies are categorized as high-income economies based on the World Bank classification. GCC countries are the richest among the MENA countries, with GDP per capita of $ 34,510 on average. Comparing, for instance, Bahrain and Algeria, Algerian per capita income is only a third of GDP per capita in Bahrain (Elbadawi & Selim, 2016).

Table 5. Oil rents as a share of GDP in GCC economies (1980-2015)

Region and country	1980	1985	1990	1995	2000	2005	2010	2015
MENA	41.28	15.07	21.00	13.74	20.39	29.87	23.11	13.01
Bahrain	16.63	7.89	7.61	3.01	3.58	3.73	3.26	2.33
Kuwait	61.67	33.92	36.25	31.69	44.97	54.24	47.92	36.26
Oman	50.57	34.15	44.96	26.68	41.83	42.45	35.26	20.42
Qatar	64.17	33.55	42.29	23.33	35.69	37.39	27.89	13.52
United Arab Emirates	41.72	20.15	32.01	14.59	19.39	23.91	19.93	12.26
Saudi Arabia	64.04	22.36	41.78	24.66	37.89	49.52	40.30	22.68

Source: World economic indicators, World Bank

1.4.2. Resource dependence indicators in the GCC economies

Empirical studies have confirmed that there is a strong relationship between economic diversification and sustained economic growth. High levels of GDP per capita and low fluctuations are significantly correlated with the diversification of output (Papageorgiou & Spatafora, 2012). Diversification in output and exports is the main channel for structural transformation and relocating of resources from the non-productive to the productive sector (McMillan & Rodrik, 2011).

While non-hydrocarbon exports have increased in GCC countries, the quality of these exports remains at a low level. There was progress in non-oil exports from 2000-2013. While non-oil exports stood for 13 percent of GDP in 2000, this had increased over the period, to reach 30 percent in 2013 (Callen, Cherif, Hasanov, Hegazy, & Khandelwal, 2014). Manufacturing exports rose furthest in the UAE, followed by Omani exports, but these manufacturing exports were concentred in chemical goods which are related to the oil industry.

Looking more closely at the structure of exports in the GCC area, Table 6 shows that oil exports are still the dominant exports and make GGC economies more vulnerable to oil price shocks. Table 6 indicates that more than half of the exports of GCC countries are from oil. In Kuwait and Qatar, for example, hydrocarbon exports make up about 92 percent of the total. This shows a high reliance on the oil industry in these two economies. On the other hand, the UAE appeared to be less dependent on oil exports, which were 15.7 percent of total exports.

Table 6. Oil exports as a share of total exports in GCC economies (1995-2015)

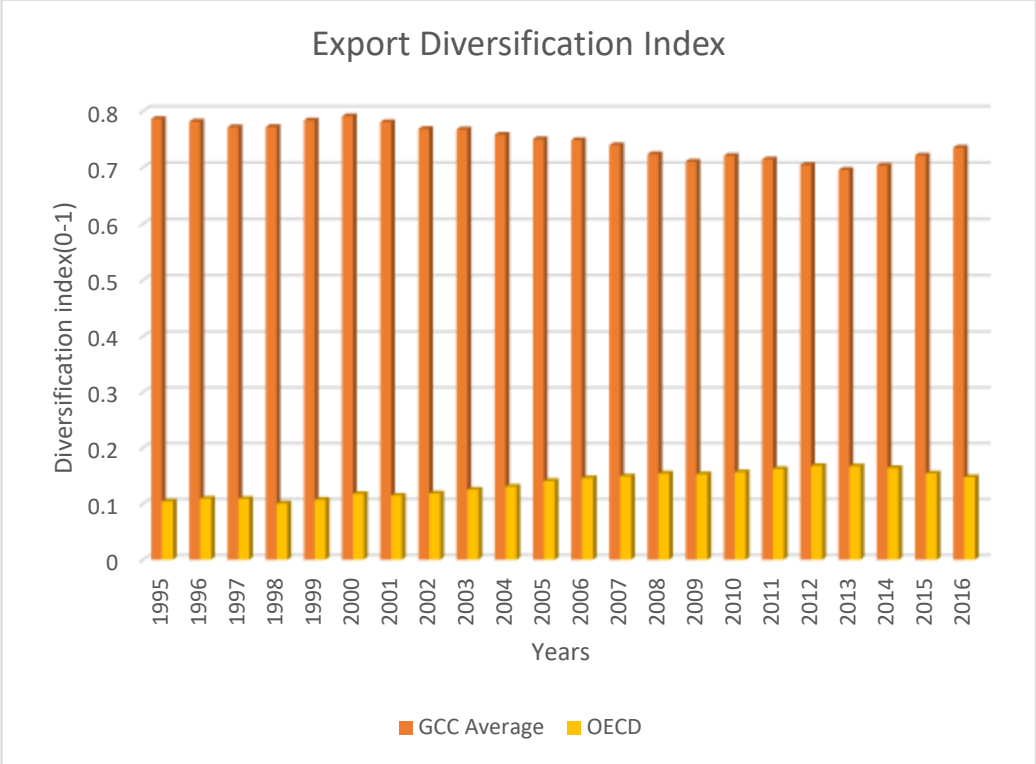
Country	1995	2000	2005	2010	2015
Bahrain	52.28	0.18	76.06	71.76	45.56
Kuwait	94.68	93.29	n.a.	92.75	89.09
Oman	78.59	82.49	84.38	67.70	62.00
Qatar	80.21	89.48	83.66	90.08	82.77
Saudi Arabia	86.76	91.77	89.70	85.90	75.90
United Arab Emirates	n.a.	76.25	44.57	37.33	15.72
GCC	78.5	72.24	75.67	74.25	61.84

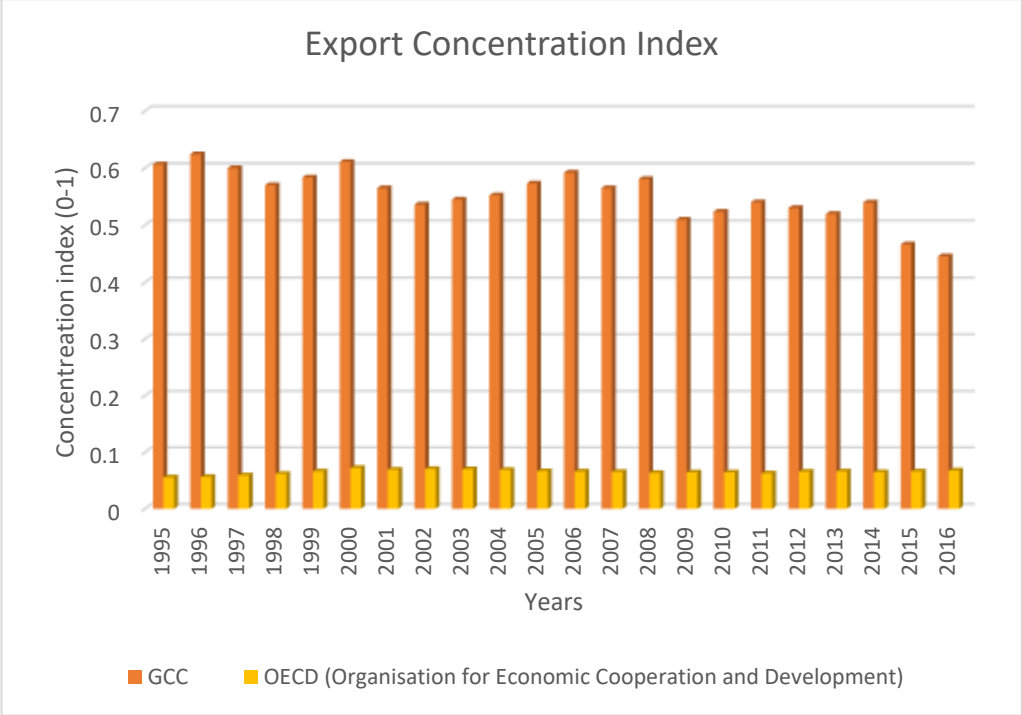
Source: World Economic Indicators, World Bank.

Note: n.a. indicates that data is not available for this year.

Further, the path of export diversification in these economies shows that GCC countries diverge away from the world pattern. The export diversification index (calculated by UNCTAD) was very high when comparing these values with OECD countries, which did not cross 0.2 at maximum, while the index was closer to 1 (ranging between 0.7 and 0.8 from 1995-2016). To make the situation worse, the export concentration index in these countries was also high. This indicates that these countries' exports are highly concentrated in a small number of products. See Figure 6.

Figure 6. Export diversification and concentration index for GCC and OECD





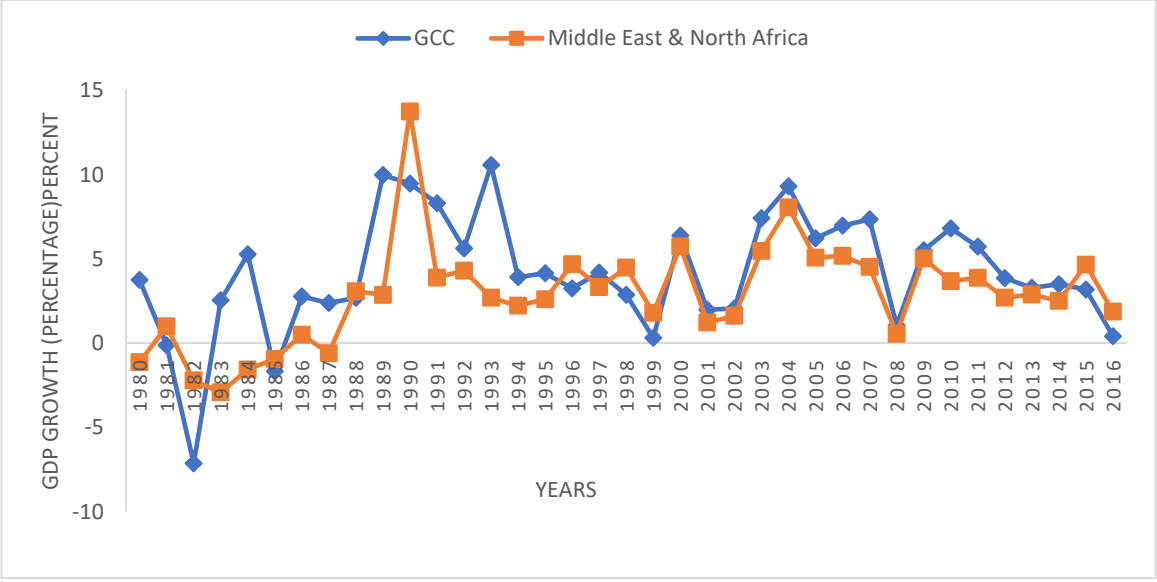
Source: Author's work, based on the UNCATD statistics

1.5. Economic growth trends in the GCC economies

Economic growth has witnessed a remarkable increase in the MENA region in general, and in GCC economies specifically. From 1980-2017, the economic growth rate averaged around 3 percent and 4 percent in MENA and GCC areas respectively. Notably, these rates rose to 10 percent in GCC countries and 14 percent in the MENA region at the end of the 1980s. Further, economic growth reached about 10 percent in the period from 2000-2007, driven by a boom in oil prices. Later, after 2008, economic growth decreased significantly, as affected by the financial crisis.

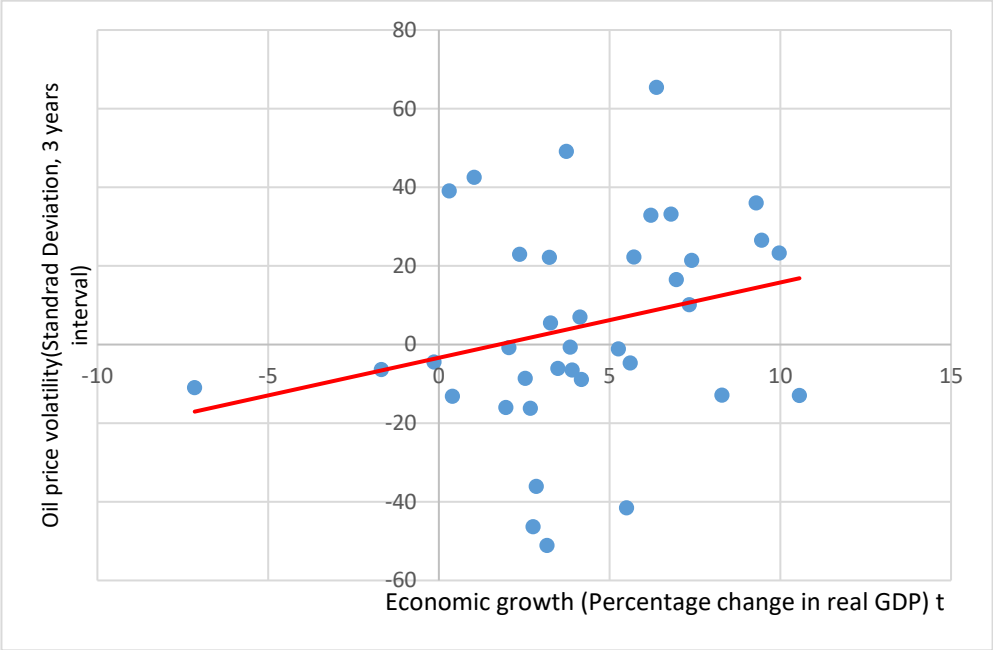
It is worth noting that economic growth measured by real GDP growth is highly volatile in MENA, as well as in the GCC economies (see Figure 9). To analyse the sources of this fluctuation in economic growth, a plot the correlation between volatility in oil prices (measured by the annual change in oil prices) and economic growth for GCC economies is provided. Figure 8 shows that there is a significant and positive relationship between variation in real GDP and fluctuations in oil prices. Therefore, this confirms that these countries are vulnerable to external shocks in oil prices.

Figure 7. Economic growth trends in GCC and MENA countries (1980-2016)



Source: Author's work, based on World Economic Indicators, World Bank

Figure 8. Oil price volatility (measured as annual percentage growth in oil prices) and economic growth in the GCC (1980-2017).



Source: Author's work, based on data from the World Bank

Turning to the structure of GDP in GCC countries, oil GDP's contribution in these economies is very high. Saudi Arabia and Qatar are among the most oil-dependent economies, with oil contributing 58.87 percent and 61.9 percent of GDP respectively. Then come UAE and Kuwait, for which countries oil constitutes about 51 percent and 53 percent respectively of GDP. Additionally, examining value-added GDP, Table 7 illustrates that the dominant sector is the mining and oil sector in GCC countries. The share taken by this sector was in excess of 70 percent of total value-added GDP in some GCC economies such as Kuwait and Qatar in the 1980s, and 60 percent in Oman and Saudi Arabia in the same period. Meanwhile, the manufacturing sector's contribution was very low, and reached a maximum of about 17 percent, with most of these products depending mainly on petrochemical materials. These statistics could raise questions regarding the success of the diversification policy in this region.

Table 7. Sectoral GDP as a share of total GDP (percentage) in GCC economies (1980-2015)

County	Year	Agriculture	Mining	Manufacturing	Construction	Wholesale, retail trade, restaurants and hotels	Transport, storage and communication (ISIC I)
Bahrain	1980	0.79	43.04	11.16	7.23	9.96	5.72
Bahrain	1990	0.75	31.46	11.28	6.33	8.20	5.97
Bahrain	2000	0.65	37.65	10.89	3.51	6.54	6.42
Bahrain	2015	0.32	33.24	17.51	7.46	7.12	7.59
Kuwait	1980	0.19	70.73	5.55	3.61	7.73	2.35
Kuwait	1990	0.87	49.93	11.49	1.81	7.52	3.65
Kuwait	2000	0.34	55.06	6.68	2.13	5.82	4.61
Kuwait	2015	0.60	46.19	5.84	2.53	5.54	6.33
Oman	1980	2.70	61.57	0.62	8.40	5.46	2.22
Oman	1990	2.67	53.09	2.94	3.78	7.44	3.38
Oman	2000	2.05	56.42	5.67	2.10	8.09	4.76
Oman	2015	1.54	43.83	9.20	7.30	8.97	5.47
Qatar	1980	0.52	70.57	3.29	5.46	4.58	1.40
Qatar	1990	0.79	52.35	13.03	4.30	5.67	2.60
Qatar	2000	0.37	66.59	5.44	3.63	5.89	3.13
Qatar	2015	0.15	47.08	9.33	9.29	9.59	4.32
KAS	1980	0.98	63.72	4.08	7.47	3.99	2.49
KSA	1990	5.69	42.52	8.51	6.46	6.38	4.51
KSA	2000	4.90	48.05	9.56	5.84	6.70	4.07
KSA	2015	2.63	38.46	12.42	6.68	11.39	6.36
UAE	1980	0.45	59.69	3.37	12.20	14.70	3.55
UAE	1990	0.97	47.99	6.81	10.48	17.71	5.15
UAE	2000	2.08	42.57	11.92	8.91	18.86	6.99
UAE	2015	0.74	34.20	8.85	9.71	14.70	9.73

Source: National Accounts Main Aggregate Database, United Nations

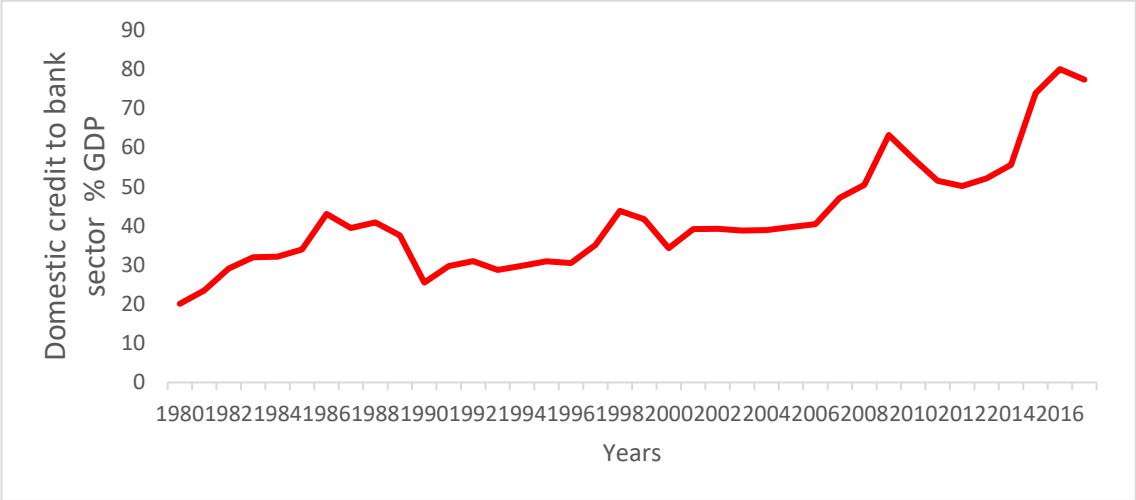
1.6. Domestic investment trends in the GCC economies

It is well documented that financial development indicators are low in natural resource-based countries. According to World Bank statistics, OECD countries, natural resource-poor economies, outpace sub-Saharan Africa and MENA regions, which are described as resource-abundant economies. Domestic credit to private banks as a share of GDP averaged about 132 percent in OECD countries between 1980 and 2017, whereas sub-Saharan Africa and MENA averaged about 50 percent and 38 percent respectively, due to poor governance and mismanagement of financial and human resources (Yuxiang & Chen, 2011). The gap between these regions may raise questions regarding the impacts of natural resources on financial development.

The finance-natural resource nexus has been widely investigated, but the empirical findings are far from conclusive. Some studies argue that the presence of natural resources stimulates financial development (Shahbaz, Naeem, Ahad, & Tahir, 2018). Natural resource capital affects the financial sector through deposits and funding. Higher natural resource revenues generate higher deposit funding for the local banking system. Natural resources might also increase the demand for loans, and hence deepen the financial system (Beck & Poelhekke, 2017). Policymakers in GCC economies have tried to improve domestic investments through providing financial resources to the private sector and financial corporations, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable. However, these economies are mainly controlled by the public sector through state-owned firms, and the difference between the public and private sectors is not straightforward, as it is occasionally difficult to attribute shareholder ownership clearly to the two sectors (Sturm & Siegfried, 2005).

Figure 9 shows that credit to the private sector as a share of GDP increased from 20 percent to 90 percent between 1980 and 2017, which is still lower than for OECD economies. Unfortunately, this increase has not been reflected in economic development, and the contribution of private domestic investment is low due to the key reasons of institutional quality and uncertainty. There is a lack of transparency in the money flows for large state-owned holding firms; Public sector firms are predominant in other main sectors such as telecommunications, energy and water supply, health and air transport. Presently, government services fund 25 percent of GCC GDP and are the main source of employment for nationals. The result in most cases is large administrations and a high share of wage payments in government budgets (Sturm & Siegfried, 2005), while secondary impacts include elements of favouritism and the protection of domestic industry (Hvidt, 2013).

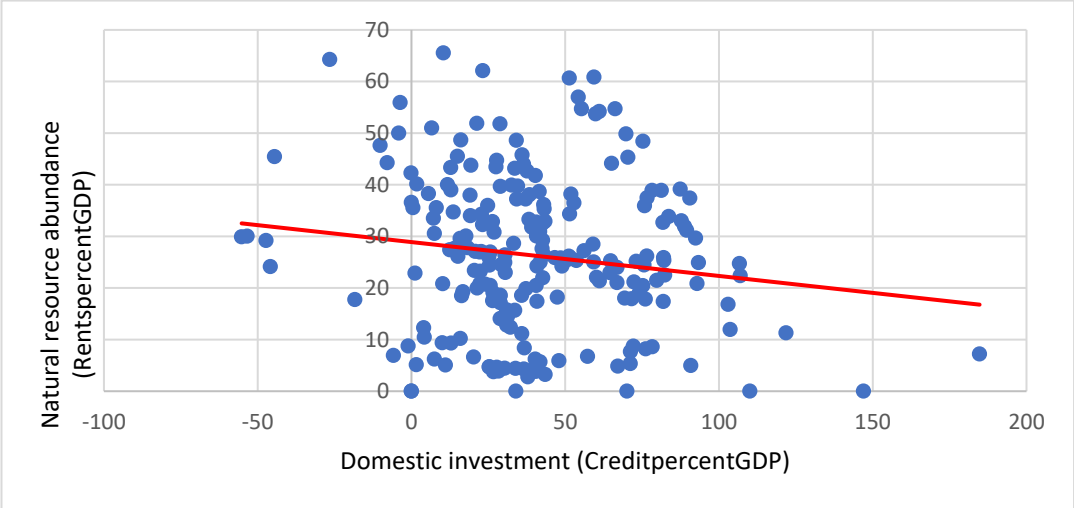
Figure 9. Trends in domestic investments in the GCC (1980-2013)



Source: Author's work, based on data from the World Bank

In addition, it seems that the GCC region suffers from the finance-natural resource curse. Figure 10 indicates the negative relationship between natural resource and financing private domestic investments. This indication is in line with some previous studies, such as Beck and Poelhekke, (2017).

Figure 10. Correlation between domestic investments and natural resources for the GCC and MENA economies (1980-2015)



Source: Author's work based on the World Bank dataset, World Development Indicators (WDI)

1.7. Future challenges facing the GCC economies

Diversification as a policy is not a new strategy in GCC economies. It is planned into the political agenda, since oil and hydrocarbon are considered the major source of income in these economies (Hvidt, 2013). However, the success of this diversification policy faces some critical issues and challenges. This section provides a brief discussion of the diversification policies adopted in selected GCC economies, and critically reviews the expected challenges in the future of these countries. These difficulties can be categorized into two broad aspects. The first dimension relates to the structure of the economies studied (private sector participation and labour market), and the second challenge is correlated with the quality of institutions.

1.8. Unsuccessful diversification policies in GCC economies

It is noted that the growth rate of the non-oil sector has increased recently in GCC economies, but that further procedures and efforts are required to encourage diversification of the production base. One of the possible channels for diversifying income from oil is the private sector. By implication, a diversification policy can be defined as eliminating the leading role of the public sector in GCC states by encouraging the growth of the private sector. GCC economies

have paid great attention toward this channel through launching well-developed policies to promote and increase the participation of this sector in the economy.

Evaluating the role of the private sector in GCC economies, it a minimal role, and there are critical issues which discourage the contribution of this sector. These include financing sources for the private sector, which is heavily dependent on the hydrocarbon industry (Hertog, 2010; Hertog, 2013) and the structure of the labour market in this sector.

Most private manufacturing industries generate oil-based products such as petrochemical products, which means that this sector faces a high level of uncertainty related to oil prices. Also, it is connected to political elites. Further, the private sector is not favourable for citizens in Gulf countries, and people rather engage with the public sector because of the high wages and social security provided. According to the Gulf Labour Market Migration (GLMM) programme (2014), foreign employees accounted for 88.2 percent of the private sector workforce during 2009-2013, and in some countries such as Kuwait, as much as 93.2 percent of labour is imported from outside the country. This is, in the end, hampers labour productivity.

When building an overview of diversification paths for GCC, two main tactics or approaches can be discerned: the first is establishing a parallel economy, as in the case of Saudi Arabia and Kuwait; while the other strategy is improving the contribution of non-oil sectors, such as in the Qatari, Bahraini and UAE experience. KSA and Kuwait fixed older firms by converting these from public or state-owned organisations to privately–owned ones. Kuwait privatised Kuwait Airways and provided a new tax policy for foreign firms to attract more investments by cutting tax from 50 percent to 15 percent. Meanwhile, Saudi Arabia put its telecommunications through the privatisation process and created new ‘smart cities’ which were designed to attract new foreign and technologies firms (Saif, 2009).

Considering promoting non-oil sectors, and focusing on the service sector, some Gulf economies have introduced policies to promote the financial sector, as in Qatar and the UAE,

through establishing the Qatar financial centre and the Dubai international financial centre (Saif, 2009). Additionally, Dubai provides good infrastructure, having built the world's tallest tower and the biggest shopping malls, to improve the tourism sector.

However, the tourism sector is particularly vulnerable to any serious conflict from geopolitical tensions. Therefore, the diversification experience in these countries is still unclear and suffers from certain limitations.

1.9. Governance challenges in GCC economies

Governance issues are still the main obstacles facing economic growth and diversification in the GCC economies, and policymakers in this region have a long way to go to remove these difficulties and improve both institutions and governance. Analysing the governance indicators of the GCC economies is critical, yet it is important to carefully consider heterogeneity among these countries.

This section utilises the sub-governance indicators constructed by Kaufman, Kraay and Mastrzzi. And these show that GCC economies are weak in governance, and specifically in political indicators. These indicators measure accountability, political stability and absence of violence.

Although GCC states vary in terms of political regimes, political governance indicators show that these economies experience low scores. Most GCC countries lack effectively elected bodies that have an important effect on decision making, except for Kuwait and Bahrain.

Based on the world governance indicators, Kuwait ranks top among GCC economies on accountability and voice of violence, followed by Bahrain and Qatar, while Saudi Arabia comes bottom. All GCC economies have a negative score for "voice and accountability": see Table 8. This means that this region needs to reconsider its political regime presentation.

Table 8. Governance indicators: accountability and voice of violence index

Voice and Accountability	1996	1998	2000	2004	2008	2012	2016
Bahrain	-0.72	-1.07	-1.06	-0.56	-0.87	-1.32	-1.45
Kuwait	-0.24	-0.30	-0.30	-0.30	-0.54	-0.64	-0.69
Oman	-0.71	-0.89	-0.76	-0.66	-1.07	-1.02	-1.11
Qatar	-0.71	-0.78	-0.65	-0.43	-1.02	-0.92	-1.20
Saudi Arabia	-1.50	-1.62	-1.60	-1.32	-1.73	-1.87	-1.78
United Arab Emirates	-0.41	-0.52	-0.52	-0.69	-0.91	-1.00	-1.12
Average GCC	-0.72	-0.86	-0.81	-0.66	-1.02	-1.13	-1.22

Source: World Governance Indicators (WGI).

Notes: aggregate is WGI measured in two ways: in the standard normal units of the governance indicator, ranging from around -2.5 to 2.5; and in percentile rank terms ranging from 0 (lowest) to 100 (highest) among all countries worldwide. For more information see Kaufmann, Kraay, and Mastruzzi (2011) and www.govindicators.org.

1.10. Summary

The overview above has shed light on a range of economic and institutional indicators in the GCC economies. This region heavily depends on the oil sector in managing activities. Because of natural resource dependence, most FDI inflows in this region are highly concentrated on the oil sector and deter non-resource FDI. Given the weak role of the private sector, these countries are vulnerable to external shocks such as oil price volatility. This instability increases the level of uncertainty in these economies and leads foreign investors to leave. Further, the GCC economies also suffer from some institutional issues. These considerations together could cause the diversification policy in these countries to fail.

Chapter 2 Literature Review

2.1. Introduction

This chapter reviews previous studies on the relationship between foreign direct investment (FDI), economic growth, and domestic investments (DI). For coherence, the literature review is made up of three segments relating to three categories of literature. These segments are the FDI-natural resource nexus, the nexus between FDI and economic growth, and the FDI-DI nexus. The following sections reflect on each nexus by drawing on existing and relevant evidence.

2.2. Foreign direct investment-natural resources relationship: FDI-natural resource curse hypothesis[2]

2.2.1. Natural resource curse definition

Natural resources as a term refers to natural capital such as oil, gas, forests, water and land that exist in nature and can be utilised for economic revenues (Badeeb et al., 2017). Natural resources can be divided into two main categories: renewable and non-renewable resources. Renewable natural resources are substances of economic value that can be replaced or replenished in the same or less time as it takes to draw the supply down. Unlike non-renewable resources, renewable resources are sustainable. Non-renewable resources are resources of economic value that cannot be readily replaced by natural means on a level equal to their consumption. The resource curse hypothesis mainly focuses on non-renewable natural resources, because of their depletion risk.

Previous literature differentiates between natural resource wealth and other kinds of wealth. According to Humphreys et al. (2007), there are two key differences. First, in particular, oil and gas do not need any production, but rely mainly on the extraction process. As a result, this type of wealth is built on technology- and capital-based industry,

[2] This term was coined by Asieud (2013)

which does not create large numbers of job opportunities. Second, most natural resources are extracted from the ground and non-renewable, which means that they are less likely to be a source of income than other assets.

Adam Smith and David Richardo believe that natural resources play an important role in economic growth and development. This is a widespread view among economists because resources such as these should provide large benefits for the country. Revenues from natural resources improve welfare by increasing levels of public and private consumption. Also, these revenues support and increase levels of investment (Badeeb et al., 2017).

However, many African countries such as the Congo, Angola, Nigeria, Sudan and others, although endowed with oil, diamonds, gas or minerals, perform poorly economically. Meanwhile, Asian economies like Japan, Korea, Singapore and others are enjoying the high income, good infrastructure and high levels of education, despite not possessing significant amounts of natural resources compared to the above- mentioned African economies.

This paradoxical phenomenon, coined the " natural resource curse", was introduced first by Auty (1993), and several researchers were then stimulated to investigate the resource curse thesis. Sachs and Warner (1995) were among the first to provide statistical evidence on the resource curse thesis; their study found that natural resources penalise economic performance. Subsequently, Sachs and Warner (2001) confirmed these results.

Sachs and Warner (1997) provide evidence that one of the main sources of slow growth in Sub-Saharan Africa is natural resources. Later, Sachs and Warner (2001) expanded their sample to cover a cross-section of resource-rich economies. They found that there was a negative relationship between natural resource abundance and economic growth.

It is worth noting that there is a stream of studies challenge Sachs and Warner's (2001) results. The main criticism made by these studies is based on the issue of endogeneity and

misinterpretation of data. While the above argument of a resource curse is plausible, it does not explain why some resource-based economies such as Norway and Canada are not suffering from the resource curse. This issue opens a new debate about the potential role of other factors in explaining the resource curse puzzle. These factors can take the form of natural resource measurement (proxies) and statistical issues. Brunnschweiler and Bulte (2008), for instance, challenge the consensus view, and conclude that economic growth (average income growth 1970–2000) is negatively related to resource dependence, but positively associated with resource abundance, using two least squares for 80 countries. In the same vein, James (2015) argues that resource-dependent countries witnessed slow economic growth during certain growth periods (1980-1990), but grew relatively quickly during others (1970-1980). This study attributes slow growth to countries' dependence on a commodity that has experienced a fast decline in price.

Manzano and Rigobon (2001) dismiss the adverse effects of natural resources on economic growth using Sachs and Warner's data (1995), after controlling for fixed effect. In the same way, Torres et al. (2013) claim that Sachs and Warner adjusted the effect in Singapore by considering resource net exports, while using the usual measure for other countries would overestimate resource abundance.

It is worth mentioning that the resource curse is associated with several other issues, such as civil war (Collier and Hoeffler, 2004), low levels of human development (Gylfason and Zoega, 2006), 2006) and weak institutions (Mehlum et al., 2006a).

2.2.2. Natural resource curse: mechanisms

The negative relationship between natural resources and economic growth has attracted many economists and politicians to investigate why natural resources are a curse rather than a blessing for resource-rich economies. The reasons behind this negativity can be categorised into two main aspects; economic and political. The economic explanations

are traced to Dutch disease, a low level of education and volatility. Political channels include the quality of institutions, corruption and political regimes (democracy)

The Dutch disease channel is a prominent explanation of the curse puzzle. This problem emerged in the Netherlands during the 1970s, when the Dutch government discovered new natural gas in the North Sea; they noticed that Dutch manufacturing sectors suddenly started performing less well than expected. Resource-abundant nations that likewise experience a decline in pre-existing domestic sectors of the economy are said to be suffering from "Dutch disease".

Dutch disease occurs when a sudden increase in the value of resource exports generates an appreciation in the real exchange rate. This process, in turn, makes non-resource commodities less competitive than imports. Foreign exchange earned from the natural resource will be used to buy internationally traded goods (called the "spending effect"). At the same time, domestic production factors such as labour and capital are transferred to the resource sector (called the "resource pull effect") (Humphreys et al., 2007; Corden and Neary, 1982).

Numerous papers within the natural resource curse literature have studied political channels. Corruption and institutional quality are among the main mechanisms. Lane and Tornell (1996) propose that the existence of powerful groups in conjunction with weak institutions better explains the natural resource curse. Additionally, Mehlum et al. (2006a; 2006b) offer empirical proof that the quality of institutions plays an important role in explaining the resource-curse. From the social perspective, Hodler (2006) shows that a high level of ethnic fractionalization is related to a low level of economic growth, and especially in oil-rich economies. As far as the political regime is concerned, Caselli and Michaels (2013) and Brollo et al. (2013) provide evidence that local corruption levels rise with oil windfalls. In particular, countries endowed with natural resources tend to have

weak institutions. Strong institutions lead to an equilibrium towards all investors who are producers, while weak institutions cause equilibrium where entrepreneurs are rent-seeking (Mehlum et al., 2006b). Gylfason (2001) shows that resource-rich economies have low levels of human capital accumulation because of low levels of education.

2.2.3. Alternative explanations

2.2.3.1. FDI

There is a large body of literature on aggregate FDI determinants and impacts. One of the main theories introduced on the locational determinants of FDI is factor endowment–based trade theory. It argues that MNCs direct their investment to economies with lower wages and large natural resources such as minerals and oil (Campos and Kinoshita, 2003). Although there is a huge and growing body of literature on FDI determinants, natural resources are not widely investigated. Interestingly, there is no consensus about the specific impact of natural resources on FDI. Some papers argue that the abundance of natural resources attracts more FDI (Anyanwu, 2012; Asiedu, 2002; Asiedu, 2006; Kolstad and Wiig, 2013; Kolstad and Wiig, 2012). Others make a contradictory argument: natural resources may deter FDI (Asiedu, 2013; Mina, 2007; Poelhekke and Van der Ploeg, 2010; Poelhekke and van der Ploeg, 2013).

One of the most cited works is a study by Asiedu (2006), who investigated the relationship between natural resources measured by the share of fuel and minerals in total exports for 22 Sub-Saharan countries. After controlling for institutional, macroeconomic stability and political variables, she found that natural resources play a significant role in the FDI inflows to this region. In the same way, the papers of Dupasquier and Osakwe (2006) and Deichmann et al. (2003) have for instance reported that the accessibility of natural resources encourages more FDI inflows. Also, Mohamed and Sidiropoulos (2010), using a panel of 36 countries (12 MENA countries and 24 other developing

countries), conclude that natural resources have an extremely important role in attracting FDI to those areas with market size, institutional quality and government size. Anyanwu (2012) arrived at the same results.

Additionally, Kolstad and Wiig (2012) study the influence of resource abundance on Chinese outward FDI to 142 economies (OECD and non-OECD) and conclude that Chinese investors prefer to invest in countries with large natural resources and a poor quality of institutions. One interpretation of this behaviour in Chinese investment is that natural resources such as oil are highly profitable: especially during booms in oil prices, and low institutional quality gives these firms more access to natural resources, as well as low taxes.

On the other hand, Asiedu and Lien (2011) provide evidence contradicting the above argument. They investigate the direct and indirect (interaction between democracy and natural resources) impacts of natural resources on total FDI inflows to 112 developing economies over the period 1982–2007. This study points to a direct and indirect negative effect of natural resources (mineral exports/total exports) on FDI inflows to these countries. Possible explanations for this negative relationship are the influence of resource price volatility, Dutch disease and a lesser degree of diversification.

Another explanation of why natural resources can be a curse for the host country is the crowding out effect. FDI inflow in resource-rich economies is concentrated on resource sectors such as oil, but deters FDI to other sectors. This argument has been demonstrated in the pioneering study of Poelhekke and Van der Ploeg (2013). This paper used disaggregated data on FDI outflows in resource and non-resource sectors from Dutch firms to 163 host economies. The main finding was that resource discovery hampered non-resource FDI by 16 percent in the short run and by 68 percent in the long run. for economies that were already resourced producers, an increase in resource rents is associated with a 12.4 percent fall in non-extractive FDI, and total FDI decreases by 4

percent if the resource bonanza is doubled. This paper provides a very solid theoretical and empirical example of the behaviour of rent-seeking FDI. Later, Asiedu (2013) tried to test the hypothesis of a negative impact of natural resources (fuel exports) on total FDI, but did not provide a clear mechanism for these negative impacts. One obstacle is the availability of sectoral FDI data.

In the GCC region, there is a very clear lack of studies on FDI-natural resource nexus, and in particular, sector-level of FDI. One paper in this region tried to examine the impact of oil prices on the foreign investor's decisions. Mina (2007) used three different proxies for natural resources (oil reserves, oil production, and oil prices) to investigate the impact of natural resource abundance on FDI. He found that all these proxies have a negative correlation with FDI inflows to GCC. To the best of my knowledge, there is no paper investigating the sectoral determinants of FDI in GCC countries. Therefore, one might investigate whether natural resources attract more non-resource FDI in GCC economies.

Some papers investigate the impact of corruption on FDI inwards in different countries. There are two main arguments regarding the impact of corruption on the economy. Although some papers found that corruption impedes economic development, or places sand in the wheel, there is a school of thought that views corruption as grease for the wheel (Leff, 1964). The next paragraphs review some literature on the FDI-corruption association.

It is argued that the impacts of corruption on FDI vary across countries and sectors. Previous literature on this issue can generally be grouped into two main strands. The first group considers corruption as a 'grabbing-hand,' which means that corruption can be seen as an additional tax on MNCs and increases the cost of doing business, ultimately discouraging FDI inflows. Also, some studies have found that investing in a more corrupt area increases costs by 20 percent compared with less corrupt countries (Barassi and Zhou, 2012). This argument that foreign firms are less likely to invest in corrupt countries

is supported by Wei and Shleifer (2000). Hakkala et al. (2008) and Wei and Shleifer (2000) for both developed and developing countries.

The second group claims that corruption could yield a positive impact on FDI as a 'helping hand'. When foreign firms try to bribe the local government, they can get around the laws and regulations. This claim could be true for developing countries, and in particular, oil-rich economies which are ruled by autocratic regimes (Kolstad and Wiig, 2012; Wheeler and Mody, 1992). Thus, it is important to check whether corruption attracts or hinders FDI inflow in GCC countries.

2.2.3.2. Volatility

A recent empirical study of 35 economies finds that countries which depend mainly on commodities with high price fluctuations experience more volatility in trade, have less economic growth and attract lower foreign direct investments compared with countries that specialize in stable-priced goods (Blattman et al., 2007; Van der Ploeg and Poelhekke, 2009). Also, less diversified countries, and in particular, resource-rich economies, lag in terms of economic development.

A major concern relates to the impacts of oil price volatility on economic activities in both developed and developing economies. Pioneering work by Henry (1974) and Bernanke (1983) investigated the association between oil price uncertainty and the behaviour of investments. Both studies conclude that a high level of volatility in oil prices leads to a low level of investment. Hamilton (2003) arrived at the same relationship: an inverse relationship between oil uncertainty and investments. In his study, he argues that high fluctuations decrease consumers' expenditure on durable goods such as cars and housing, and negatively impact on firms' investments.

The most closely related work is that of Van der Ploeg (2009), who firstly introduced the volatility channel of the resource curse. In this study, it was demonstrated that GDP per capita volatility hurts economic growth. Blattman et al. (2007) found that there is a

negative relationship between oil price volatility and FDI. A high level of oil price volatility leads to low resource-FDI. This study tests whether a high level of oil volatility leads to low resource-FDI inflows.

2.3. Foreign Direct Investment (FDI)-economic growth relationship

The relationship between FDI flows and growth has been widely viewed and investigated during the past few decades. A flood of literature has been put forward about this nexus. This literature can be classified into two groups. The first group examined the impact of FDI at the macro level, which correlated real GDP per capita growth with FDI inward flows or FDI outflows of stock, including other variables. The second used firm-level data to find evidence of the effects of FDI on productivity growth in industries or sectors.

2.3.1. FDI-Growth nexuses: aggregate level

The majority of empirical works at the macro level investigate the FDI-led-growth hypothesis using gross FDI inflows for a cross-section of countries. Generally, they conclude that there is a positive association between FDI and growth in the host country, depending on a variety of variables such as the degree of openness, institutional quality, level of income, level of human development, financial development, political regime and infrastructure.

In one pioneering study, Wallis (1968) noted that an increase of FDI from the United States to European countries encouraged economic growth. Then, Feldstein and Horioka (1980) investigated the connection between international capital flows and domestic savings. Balasubramanyam et al. (1996) estimated the role of FDI inflows in growth, covering 46 countries in the developing world. They found that countries that apply import substitutions (IS) are less attractive to foreign capital and the impact of FDI is not strong, while export promoting (EP) countries are more attractive to international capital and enjoy a good economic growth rate. Blomström et al. (2001) pointed out that FDI has

beneficial impacts for high-income developing countries rather than low-income countries.

De Mello (1999) found a strong relationship between FDI and economic growth in the long term, which is also sensitive to country-specific factors. In terms of the financial market, Alfaro *et al.* (2004) confirm that a well-developed financial market is highly attractive to FDI and enhances economic growth. Also, Helpman (2006) reports that FDI volatility has detrimental effects on growth.

Recently, in terms of comparing between two regions, Bhattarai (2015) studied the impact of FDI on economic growth in BRICS[3] and OECD countries theoretically through an endogenous growth model, and empirically using panel data for five BRICS countries and 30 OECD countries over 1990 to 2004. He concludes that FDI significantly affects economic growth.

In GCC countries, to the best of the author's knowledge, there is a lack of empirical studies about this area in particular. Faras and Ghali (2009) tested the association between FDI and economic growth from 1970-2006 in six GCC countries, using panel data. They concluded that FDI is a significant contributor to economic growth. Also, Toone (2012) found a positive correlation between FDI and growth over the period from 2002 to 2010.

2.3.2. FDI-Economic growth: disaggregate level studies

Most previous studies on the association between FDI and economic growth focused mainly on the aggregate level of FDI. Few studies are evaluating this relationship based on micro-level data. These papers can be grouped into two main streams: firm level and sector-level studies.

[3] BRICS refers to Brazil, Russia, India, China and South Africa.

Firm-level literature argues that technologically advanced foreign firms are more productive than local firms, which contributes significantly to economic growth, but this argument is not always the case.

For instance, Lall (1978) notes that some important factors should be taken into account regarding conclusions that foreign firms are more efficient than local firms, such as firm size, technologies used and market conditions. Lall (1978) based his argument on a study by Vaitsos (1976), who pointed out that multinational firms have higher labour productivity than domestic companies because FDI firms have good management and advanced technologies.

Among the studies that found positive productivity spill-over was Aitken and Harrison (1999), using panel data from plants in Venezuela from 1976 to 1989. They stated that this positive relationship was only robust for small enterprises. Further, Diankov and Hoekman (2000) concluded that in the Czech Republic, foreign firms increased total factor productivity and labour productivity.

However, Haddad and Harrison (1993) reject the hypothesis that FDI firms induce growth in productivity. They support their argument based on data from the Moroccan manufacturing sector. Additionally, Konings and Murphy (2001) applied panel data analysis for Eastern European firms (Poland, Romania and Bulgaria) and tested the impacts of foreign corporations on local firms' productivity. They present evidence, which shows that FDI firms perform better than domestic firms only in Poland, but not in the other countries studied.

Some scholars have claimed that MNCs could inversely affect local firms through a competition effect, which causes low productivity for domestic firms. (Aitken and Harrison, 1999; Konings, 2001; Gorg and Greenaway, 2003). Regarding GCC countries,

there is a shortage of literature on the impact of multinational corporations on local firms' productivity.

On the other hand, sectoral FDI-growth literature investigates which kind of FDI contributes to or hinders economic growth. Alfaro's (2003) was the first study to investigate the impacts of FDI in three main economic sectors on economic growth. One of the most interesting findings of this study is that mining FDI is negatively correlated with economic growth for a panel of 47 economies during 1980-1999, but FDI inflows to the manufacturing sector accelerate growth. These results open the door to many questions regarding the reasons behind this negative impact.

Later, Vu and Noy (2009), using an endogenous growth framework, studied the effects of FDI inflows across 12 sectors over the period 1989-2003. They found that total FDI promoted economic growth, but that this effect varies among the sectors. In their study, they confirm Alfaro's (2003) hypothesis of a negative relationship between mining FDI and growth.

Dyotch and Uctum (2011) question whether the shift of FDI inflows from the manufacturing sector to the service sector supports economic growth. In their analysis, they control for endogeneity through using GMM estimations, and they find that total FDI has a positive and significant effect on economic growth. This effect operates in manufacturing FDI in Latin America, Europe and central Asia. The service sector, however, does not always promote economic growth and is more likely to lead to de-industrialization in some economies.

2.4. Foreign Direct Investment (FDI)-domestic investment (DI) relationship

The existing literature on the association between FDI and DI is far from conclusive. Some papers have found that FDI enhances DI, but others have reached the opposite conclusion: that FDI reduces DI.

Feldstein (1995) is among the most significant and cited works in favour of the impact of FDI on DI. Utilising a macro-level dataset for OECD countries during the 1970s and 1980s, Feldstein (1995) found that higher outward FDI reduced DI, while FDI inflows had a positive impact on local investments after controlling for several macroeconomic determinants of DI. Andersen and Hainaut (1998), using a dataset for the 1960s and 1990s, reported that FDI outflows tended to reduce DI in the United States, Japan, Germany, and the United Kingdom.

There are several mechanisms that explain the negative relationship between outward FDI and local investments. Among the earliest ideas is the substitution of foreign activities for DI: firms shift their production factors abroad (Stevens and Lipsey, 1992).

Taking the opposite view, firm-level studies have argued that outward FDI could promote DI. Outward FDI enables corporations to enter new markets, have access to intermediate goods at lower prices, and gain access to foreign technologies. Based on this process, outbound-investing firms increase their competitiveness by combining home production with foreign production. Stevens and Lipsey (1992), using firm-level data for seven American firms over periods of 16–20 years, found that there is a significant and positive association between outward FDI and DI.

Other authors have found similar results. For instance, Desai et al. (2005) compared macro models to micro models, first replicating Feldstein's estimates using a broader sample of countries during the 1980s and 1990s, using OECD-country aggregated data, then using firm-level data for US multinational corporations (MNCs). Their empirical study found two different results. Using macro-level estimations, FDI had a displacement effect on DI, confirming the results of Feldstein (1995); however, higher broad investment by American firms was positively associated with DI through a combination of home production and foreign production that generated final products at lower cost.

Considering the short- and long-term impacts, Herzer and Schrooten (2008) found that outward FDI had a positive effect, in the short term, on German DI, while DI was negatively correlated with FDI outflows in the long term. Broad investment complemented DI only in the short term in Germany.

Along the same lines, Hejazi and Pauly (2003) found that the effect of outward FDI by Canadian multinational corporations (MNCs) varied depending on the investment partner. Using a sectoral dataset over the period from 1984 to 1995, they found that Canadian outward investment in the US complemented DI in Canada, while investment in the rest of the world had a negative effect.

Considering the origins of investors, Ni et al. (2017), using a Vietnamese firm-level dataset for 2001–2011, investigated whether the origins of foreign investors generated different effects on DI in Vietnam. The main findings of the study were that Asian foreign investors contributed positively to local firms, but the effects of foreign investments from North America were not significant. With regard to Asian FDI, the study concluded that investments from China and Taiwan had the most significant impacts on local firms in Vietnam.

Focusing on inter-industry interactions between MNCs and domestic markets in Eastern European countries from 2001–2007, Hanousek et al. (2017) found that FDI raised demand for intermediate goods, but that domestic suppliers benefitted more from FDI inflows only through positive shocks. After that, they faced a crowding-out effect by MNCs when the larger companies entered upstream sectors.

Surprisingly, very few studies have tried to investigate the impacts, on a sectoral level, of FDI on domestic economic activities. Only one empirical work, to the best of the author's knowledge, has examined the impacts of sectoral FDI inflow on domestic entrepreneurship. Using disaggregated data on FDI inflows into 96 countries from 2004–

2012, Doytch (2016) found that service and mining FDI improved DI, and particularly financial FDI crowding in local activities. However, FDI in manufacturing yielded a negative impact.

Although previous studies have used several approaches and different datasets, they did not control for one serious methodological issue: the endogeneity of outbound FDI. The endogeneity issue occurs when there is reverse causation between DI and FDI, and between saving ratio and DI. Feldstein (1995) states that '[a] country that offers a good environment for DI is also likely to attract more inbound FDI and may also experience less outbound FDI' (Feldstein, 1995:55). Feldstein failed to find a proper instrumental variable and proposed some likely instruments but could not find data on those variables. Instead, he introduced more explanatory variables, which may correlate with both FDI and DI. Doytch (2016) is an exceptional empirical work in that it considers the issue of endogeneity between FDI and DI using system GMM.

2.5. Summary

After reviewing the related literature on the above relationships, it is clear that there is a lack of empirical studies on the sectoral level of FDI in general, and on GCC areas specifically. It is understood that the availability of data on sectoral–level FDI may be one of the main determinants of the shortage of such studies.

Therefore, this study investigates the above relationships in an oil-dependent area (GCC) under the concept of the natural resource curse hypothesis, utilising a unique data set from the Financial Times (FT) that tracks the FDI inflow to each sector since 2003.

Chapter 3 Methodology and Data Construction

3.1. Methodology

This thesis focuses mainly on six oil-dependent economies (in the Gulf Cooperation Council, hereafter, the GCC) during two different periods: 1980-2013 for the United Nations Conference on Trade and Development (UNCTAD) dataset; and 2003-2013 for the Financial Times (FT) dataset, as discussed in Section 3.2 in this chapter. Given this information, panel data techniques are applied to estimate the proposed models: "panel data or longitudinal data typically refer to data containing time series observations of a number of individuals. Therefore, observations in panel data involve at least two dimensions; a cross-sectional dimension, indicated by subscript i, and a time series dimension, indicated by subscript t" (Hsiao, 2007:1).

The key advantage of using panel data is the large number of observations (several periods of data per individual country), which creates more degrees of freedom and more sample variability than cross-sectional data. Therefore, this approach improves the precision of the estimation.

This study presumes that GCC economies have many characteristics in common, such language (Arabic) and politics (each country has a monarchy), but that these countries are heterogeneous in terms of regulations, some economic policies, traditions and culture. Panel data has an advantage in controlling for this heterogeneity (or unobserved effects) for each economy, which is captured by α_i in the models.

The fixed effect (FE) model treats α_i as a country-specific constant term in the estimations, which is fixed over time ($\alpha_i = \alpha$) and can be associated with independent variables. However, a random effect model (RE) considers country characteristics as a random variable and as uncorrelated with explanatory repressors (Cameron, 2010, Baltagi, 2008).

This study reports both results of FE and RE estimations using the statistical software STATA.15. Next, a brief discussion on how FE and RE deal with heterogeneity between countries is given (Wooldridge, 2010):

Suppose y_{it} is a dependent variable of country i at time t, $X_{i,t}$ is a $Kx1$ vector of explanatory variables, are the country effects and ε is the error term.

$$y_{i,t} = \alpha_i + X'_{i,t}\beta + \varepsilon_{i,t} \qquad (3.1)$$

Taking a time average for Equation (3.1),

$$\overline{y_i} = \alpha_i + \overline{X_i}\beta + \varepsilon_{it} \qquad (3.2)$$

As assumed earlier, in the fixed effects model, $\alpha_i = \alpha$. Subtracting (3. 2) from (3.1) gives equation (3.3):

$$y_{i,t} - \overline{y_i} = \left(X_{i,t} - \overline{X_i}\right)\beta + (\varepsilon_{it} - \varepsilon_i) \ , \ i = 1,2,\dots,N, \quad t = 1,2,..,T \ (3.3)$$

The α_i is cancelled out, and this estimator gives a consistent estimate of β in the fixed effects model, but the Pooled Ordinary Least Squares (POLS) estimator does not.

The random effect model meanwhile assumes that α_i is not correlated with explanatory variables. This is an appropriate model if it is possible to be confident that the differences between countries can be viewed as a parameter in the regression function (Greene, 1993). The panel data model can be written as follows;

$$y_{i,t} = \mu + X_{i,t}\beta + \alpha_i + \varepsilon_{it} \qquad (3.4)$$

The individual-specific effects αi are assumed to be realizations of iid random variables with distribution [0,σ_α^2], and the error εi, is iid [0,σ_α^2]. The random scalar intercept μ is added so that the random effects can be normalized to have a zero mean.

From the empirical perspective, both FE and RE have some advantages and disadvantages. The FE model is costly in terms of degrees of freedom lost. In addition, FE model ignores between-panel variation, and focuses only on the within-variations. In the empirical section of both FE and RE, results will be reported. The choice between FE and RE is subject to the specification of the Hausman test. The null hypothesis of the Hausman test is that RE is appropriate (Hausman, 1978).

One of the main concerns in panel data analysis is the endogeneity issue. Endogeneity refers to the correlation of the right-hand side variables and the error term in the regression models. In other words, an empirical model for which $E(\varepsilon|\mathrm{X}) \neq 0$ is said to suffer from an endogeneity problem. Whenever there is endogeneity, OLS estimates of the β's will no longer be unbiased because one of the main assumptions of OLS has failed (Baltagi, 2008).

In this part of the thesis, there is a discussion of the possible sources of this issue in general, and the empirical chapter (Chapter 4) discusses the sources of endogeneity for each proposed model based on previous literature and diagnostic tests.

Theoretically, there are three main sources of endogeneity. The first is that of omitted variables, There is an omitted variable bias when a variable which affects the left-hand side variable and is correlated with one or more explanatory variables is omitted from the regression (Wooldridge, 2010). This means that the exogeneity condition is violated and thus that endogeneity is present. The second source is the errors-in-variables problem. This issue arises when the true value of a regressor, Xi, is unobserved. Instead, the analyst measures the 'error ridden variable', X^*. The third and most common source is simultaneity, which occurs when the causality runs in both directions: from the regressor(s) to the dependent variable; and from the dependent variable to the regressor(s) (Wooldridge, 2010).

Dealing with potential endogeneity requires a set of valid instruments that are exogenous but correlated with an explanatory variable of interest. In other words, the instrumental variable should satisfy this condition $E(\varepsilon|\mathrm{Z}) = 0$ and $E(Z|\mathrm{X}) \neq 0$ where Z donates the instrumental variable and X is the explanatory variable of interest.

Finding a valid instrumental variable is difficult in the study because of panel data availability. We will depend on the instruments suggested by the previous empirical studies in the field. Also, this study tests the validity and strength of these instruments based on several diagnostic tests, as discussed in detail later in this section.

The most commonly-used estimators to mitigate endogeneity include the generalized method of moments (hereafter, GMM). Arellano and Bond (1991) and Blundell and Bond (1998) propose dynamic panel estimators for panel analysis when: N (number of panels) is larger than T (time), the dependent variable is dynamic and depends on its previous values and some explanatory variables may be endogenous (Roodman, 2009a).

There are two GMM estimators proposed; difference GMM and system GMM. Difference GMM starts by transforming all explanatory variables by differencing, and uses GMM (Arellano and Bond, 1991). The system GMM estimator augments difference GMM by introducing an additional assumption that the first differences of instrumental variables are uncorrelated with fixed effects. This allows more instruments to be created and can significantly improve the efficiency of estimations (Blundell and Bond, 1998).

Baltagi (2008) provide a brief illustration of the basic idea of these two estimators as follows:

Suppose that we have a simple autoregressive model with no regressors:

$$y_{i,t} = \delta y_{i,t-1} + \mu_{i,t} \qquad (3.5)$$

Where $uit = \mu i + vit$ with $\mu i \sim (0,\sigma_{\mu}^2)$ and $vit \sim (0,\sigma_{v}^2)$.

Taking the first difference of the equation (3. 5), to get a consistent estimate of δ as $N \rightarrow \infty$ with T fixed, we first-difference (3. 5) to eliminate the individual effects,

$$y_{i,t} - y_{i,t-1} = \delta(y_{i,t-1} - y_{i,t-2}) + (\vartheta_{i,t} - \vartheta_{i,t-1}) \qquad (3.6)$$

and note that $(\vartheta_{i,t} - \vartheta_{i,t-1})$ is MA(1) with the unit root . For t=3, the first period observing this relationship, we get:

$$y_{i,3} - y_{i,2} = \delta(y_{i,2} - y_{i,1}) + (\vartheta_{i,3} - \vartheta_{i,2}) \qquad (3.7)$$

In this case, $y_{i,1}$ is a valid instrument, since it is highly correlated with $(y_{i,2} - y_{i,1})$ and uncorrelated with $(\vartheta_{i,3} - \vartheta_{i,2})$ as long as $\vartheta_{i,3}$ does not suffer from serial correlation. However, note what happens for t = 4, the second period observed (3.8):

$$y_{i,4} - y_{i,3} = \delta(y_{i,3} - y_{i,2}) + (\vartheta_{i,4} - \vartheta_{i,3}) \qquad (3.8)$$

In this case, $y_{i,2}$ and $y_{i,1}$ are valid instruments for $(y_{i,3} - y_{i,2})$, since both $y_{i,2}$ and $y_{i,1}$ are not correlated with $(\vartheta_{i,4} - \vartheta_{i,3})$. It is possible to continue in this fashion, adding an extra valid instrument with each forward period, so that for period T, the set of valid instruments becomes $(y_{i,1}, y_{i,2}, \ldots, y_{i,T-2})$.

However, the GMM estimator suffers from two main issues. The first is that the internal instruments (lagged-levels) are weak instruments if the autoregressive process is too persistent (Arellano and Bond, 1991; Blundell and Bond, 1998). To solve this problem, Blundell and Bond (1998) and Arellano and Bond (1991) suggest using additional moment conditions in which the lagged differences in the dependent variable are uncorrelated with levels of the error term. To obtain these additional moment conditions, the authors assume that the panel-level effect is unrelated to the first observable first-difference of the dependent variable.

Another key disadvantage of GMM estimators is instrument proliferation. This refers to the abundance of internal instruments (Kiviet et al., 2017). In other words, there are too

many instrumental variables exceeding the number of panels. Roodman (2009b) illustrates the mechanism of instrument proliferation and its costs: "if T=3, difference GMM generates only one instrument per instrumenting variable, and system GMM only two. But as T rises, the instrument count can easily grow large relative to the sample size, making some asymptotic results about the estimators and related specification tests misleading" (Roodman, 2009b:139). This leads to overfitting of the endogenous variable; numerous instruments can overfit instrumented variables, biasing coefficient estimates towards those from a non-instrumenting estimator.

Based on the above discussion, the data sample is limited to 6 panels (GCC countries) over a period of 34 years (1980-2013) for the UNCTAD dataset and 11 years (2003-2013) (N<T). Therefore, it is difficult to apply a GMM estimator because this leads to inconsistent results.

As an alternative, this study adopts the instrumental variable estimation (IV). The IV estimator offers a consistent estimation under the very strong assumption that an exogenous instrument exists (valid IV) which satisfies $E(\varepsilon|\mathrm{Z}) = 0$. This assumption implies that $E\left(\mathrm{y_{i,t}} - \mathrm{X_{i,t}}\beta\middle|\mathrm{Z}\right) = 0$.

The set-up of the IV model is as follows:

Suppose that there is a general model given in equation (3.9) and that X is an endogenous variable need to be instrumented by Z. Then, the first stage equation (also called a reduced form) can be written as;

$$X_{i,t} = \mu + Z_{i,t}\gamma + \alpha_i + \varepsilon_{it} \qquad (3.9)$$

The first stage equation contains only the exogenous variables on the right-hand side, which is Z in this equation. The model (3.4) can be simply written as;

$$y_{i,t} = \mu + X'_{i,t}\beta + \alpha_i + \varepsilon_{it} \qquad (3.10)$$

Where X' is the residuals of equation (3. 9). By doing so, this model mitigates the issue of endogeneity through regressing y on X using instrument Z.

The main advantage of the IV estimator is that it does not require a specific number for the sample size, like in GMM. However, the main challenge is finding valid and strong instruments. Consistent with these criteria, empirical studies undertake an examination of the first stage *F* statistics and perform a test for over-identification. However, recent empirical papers on weak instruments have revealed that these diagnostics may not be adequate. Therefore, several tests have been introduced to check the instruments' strength. This thesis applies the Cragg–Donald (C–D) statistic, among other diagnostic tests, to decide whether or not the instruments are weak. Andrews and Stock (2005) have compiled critical values for the Cragg-Donald F statistic for several different estimators (including IV and Limited Information Maximum Likelihood, LIML hereafter). When exceeding the threshold that Andrews and Stock (2005) provide, it can be stated that the instruments are strong: i.e., they satisfy the relevance condition.

Another challenge related to the IV estimation is the fact that "IV estimations can exhibit severe finite-sample bias and the finite-sample distribution can be very different from the asymptotic distribution, which distorts the size of tests and the coverage of confidence intervals" (Dobson and Ramlogan-Dobson, 2012:1542). Alternatively, the Limited information maximum likelihood (LIML) estimation is performed here. The LIML method proposed by Anderson and Rubin (1950) and Anderson et al. (2010) is well suited for dynamic panel estimations and may perform better than the GMM on various occasions. LIML and GMM estimators are asymptotically equivalent, but as T increases, LIML has a smaller asymptotic bias than GMM. Also, LIML is suggested as a viable alternative to GMM to guard against the small sample bias of GMM (Baltagi, 2008). The advantages of LIML over other approaches such as GMM are that: (i) it is virtually unbiased, even with weak instruments, and it may perform better than 2SLS estimation;

and (ii) in the case of small sample sizes (which is the case in this study), LIML estimation has been characterized as "the most reliable" estimator (Blomquist and Dahlberg, 1999; Doumpos et al., 2016).

To sum up, FE and RE results will be reported with the Hausman test. Also, IV estimations will be applied. LIML results are reported as an extra estimation in the case of weak instruments.

3.2. Data construction

This section takes an in-depth look at the data used in this thesis, discussing the sources and variables construction. This study utilizes two different data sets during two different periods. The first data span covers 1980-2013 for UNCATD data and the second covers 2003-2013 for Financial Times (FT) data for a sample of 6 oil-dependent countries (GCC); namely, Bahrain, Kuwait, Qatar, Oman, Saudi Arabia (KSA) and the United Arab Emirates (UAE).

This section has two parts. In the first section (Section 3.2.1), there is a discussion of the measurement and definition of all variables used in the empirical chapter. Then, Section (3.2.2) presents and analyses the descriptive statistics and correlation.

3.2.1. Variables definition and measurements

3.2.1.1. FDI

Since this thesis is interested in examining the determinants and the effects of aggregate and disaggregate (sectoral) foreign direct investments, the study uses two proxies for FDI; total FDI inflows from the United Nations Conference on Trade and Development (UNCTAD) database and Greenfield FDI inflows from FT dataset.

Based on UNCATD, FDI is defined as "the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of

earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows in the reporting economy and is divided by GDP" (World Bank, World Development Indicators, 2018: Data ID CC-BY 4.0). One possible measurement of total FDI is net inflows of FDI/GDP, but some economies in their annual data have negative inflows. Hence, we use inward FDI stocks as a share of real GDP because they are available for a large number of developing countries and less affected by potential endogeneity biases (Nunnenkamp and Spatz, 2003). Also, this variable has been commonly used in previous literature, such as in Asiedu (2002), Asiedu (2013), Asiedu (2006), Asiedu and Lien (2011) and Azman-Saini et al. (2010). This variable is collected from the UNCTAD database and covers 1980-2013.

However, this definition pools together two very different forms of foreign investment: greenfield investment, whereby foreign firms build a new productive unit from scratch, and mergers and acquisitions (M&As), whereby foreign investors acquire existing assets (Canton and Solera, 2016). Therefore, this thesis utilizes greenfield FDI data.

There are two main advantages of the use of greenfield FDI data. Firstly, greenfield FDI does not include cross-border mergers and acquisitions (M&A). FDI inflows have different impacts on the host economy vary across types of FDI, depending on whether they are a greenfield (new foreign firm) or cross-border M&A (foreign acquisition of an existing domestic firm). The common argument on the effects of FDI suggests that greenfield FDI is expected to have a direct impact on productivity, capital formation, and, employment of host countries, while cross-border M&A only involves a change from local to foreign ownership of existing assets and production capacity (Norbäck and Persson, 2005; Ashraf et al., 2016; Amoroso and Moncada-Paternò-Castello, 2018). Secondly, the greenfield FDI projects are categorized by their primary investment activities, such as manufacturing, construction, business services, R&D, etc.

The greenfield FDI data is collected from the Financial Times (FT) covering 2003-2013. Since 2003, the FDI intelligence unit has tracked and verified individual cross-border greenfield investment projects. Greenfield FDI refers to a form of foreign direct investment where a parent company builds its operations in a foreign country from the ground up. In addition to the construction of new production facilities, these projects can also include the building of new distribution hubs, offices and living quarters.

Data from the Financial Times (FT) contains about 35 sectors. The data was constructed based on two main sectors to achieve the objectives of this study. The resource sector of an economy is the sector that makes direct use of natural resources or exploits natural resources. This includes agriculture, forestry, fishing, mining and oil. This study considers FDI inflows to coal, oil, natural gas, minerals, and metals as resource FDI. This includes agriculture, forestry, fishing, mining and oil. Meanwhile, the non-resource sector refers to the secondary sector, which produces manufactured goods and the tertiary sector, which provides services (manufacturing and service sectors). Manufacturing comprises warehousing, energy, building and construction, industrial semipro, automotive, ceramic, plastic, beverages, consumer elected, non-automotive, automotive component, engines turbines, textiles, biotech, paper and printing, medical devices, business machines, consumer products, industrial machinery, and electronic components. The service sector includes real estate, hotel and tourism, financial services, communications, business services, transportation, software and IT, aerospace, leisure & entertainment, pharmacies, space and defence and healthcare.

3.2.1.2. Natural resource

There are several measurements for a natural resource, such as oil prices, oil GDP, oil exports and oil rents. Oil prices could be biased because of their endogeneity. GCC

countries are the main producers in OPEC and have a large share in this market. Therefore, they have the ability to control oil prices through the oil supply.

Following the recent literature, this study employs real oil GDP as a share of real GDP as a measure of natural resources. This variable gives an indicator of resource dependence and reflects the degree of diversification of the economy. Recent studies consider a country as a resource country if oil-GDP constitutes more than 10 percent of total GDP (Perez-Sebastian and Raveh, 2015). This study also uses oil rents as an alternative proxy for natural resources in this region: "oil rents are the difference between the value of crude oil production at world prices and total costs of production" (World Bank, World Economic indicators, 2018: data ID 1296). The oil rents in developing countries depend on the extraction process by multinational firms (Perez-Sebastian and Raveh, 2015). Thus, we believe oil rents to be exogenous. Several previous studies use the share of oil rent in GDP as a variable for natural resources, including Asiedu (2013), Asiedu and Lien (2011) Poelhekke and van der Ploeg (2013) and Perez-Sebastian and Raveh (2015).

3.2.1.3. Domestic investments

To examine the effect of FDI on specific domestic sectors, domestic investments are divided into public and private investment. As a proxy for public DI, the approach of Feldstein (1995), Borensztein et al. (1998), Hejazi and Pauly (2003), Herzer and Schrooten (2008) is followed, with public investment measured by gross capital formation (GFCF) as a share of GDP. According to the World Bank, GFCF includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. According to the 1993 SNA, net acquisitions of valuables are also considered capital formation. This variable is taken from the World Economic Indicators database.

There are many proxies for private DI, including gross capital formation in the private sector as a percentage of GDP and domestic credit issued to the private sector as a share of GDP. Due to data constraints, this study adopts the latter proxy. Domestic credit to the private sector refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of nonequity securities, and through trade credits and other accounts receivable that establish a claim for repayment. For some countries, these claims include credit to public enterprises.

3.2.1.4. Control variables

In this study, we control for several variables to estimate the effects and determinants of FDI. Following the previous papers, this study includes GDP per capita as a measure of the market size (Wei, 2000; Edwards, 1990; Tsai, 1994). The GDP per capita is measured by "the sum of gross value added by all resident producers in the economy, plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 U.S. dollars" (World Bank, World Economic indicators, 2018: data ID CC BY-4.0). This variable is collected from the World Bank dataset.

We also control for the trade restrictions by including the trade openness variable (Asiedu, 2002; Asiedu, 2013; Asiedu, 2006; Asiedu and Lien, 2011; Edwards, 1990; Gastanaga et al., 1998). This variable is calculated based on the formula of World Economic Indicators. Trade openness is the sum of exports and imports of goods and services measured as a share of gross domestic product (export + import)/GDP. Another policy variable controlled for is the inflation rate. Inflation is a measure of macroeconomic stability (Asiedu, 2002; Asiedu, 2006) and offers an overall picture of the health of the economy.

It is given as annual percentage change in the consumer price index (CPI) and collected from World Economic Indicators (World Bank dataset).

Labour costs can also be one of the determinants for FDI, economic growth and domestic investment. The common measure of this variable is the labour wage. Due to data availability on wages in GCC economies, the labour force is used as an alternative proxy for labour cost. This data is obtained from the UNCTAD dataset.

Since institutional quality plays a significant role in attracting foreign investors, two different proxies are included for this variable; the corruption perception index (Kolstad and Wiig, 2013; Asiedu, 2013) and political instability index (Asiedu, 2006). The corruption perception index by international country risk guide (ICRG) is a variable with a range from 0 (highest corruption) to 6 (no corruption). Also, political instability ranges from 0 (no vulnerability) to 10 (highest vulnerability) and is obtained from the ICRG.

The impacts of these control variables will be discussed in detail in the empirical chapter and their effects related to previous literature.

3.2.2. Descriptive statistics and correlations

Table 9 and Table 10 report a summary of descriptive statistics for all variables used in the empirical chapters. Two different summary statistics are reported because this study utilises two datasets (UNCTAD and World Bank, Financial Times) during different periods (1980-2013 and 2003-2013). A balanced panel data set was selected, with 6 countries over 34 years for UNCATD data and 11 years for FT data. From Tables 9 and 10, it is obvious that GCC economies rely heavily on oil. Oil rents accounted for about 66 percent of GDP at maximum and about 28 percent on average between 1980 and 2013), while oil rents constituted more than 60 percent at maximum and about 33 percent on average from2003-2013. The abundance of natural resources has attracted more FDI inflows to these economies. From the same tables, the share of FDI in GDP reached about

85 percent between 1980 and 2013. The majority of these foreign investments concentrated on the resource sector, arriving 88 percent of GDP because of the oil price boom. However, GCC countries during the study periods witnessed low economic growth; the growth of GDP per capita reached -0.61 percent (on average) over the period between 1980 and 2013. Also, GDP per capita growth recorded about -0.02 from 2003-2013. These statistics motivated checks to be made on the correlation between these variables, plotting the relationships as a preliminary exercise for the hypotheses.

Table 9. Descriptive statistics of variables used (1980-2013)

Variable		Mean	Std. Dev.	Min	Max	Observations
FDI inflows stock /GDP	overall	15.15	17.98	0.05	84.83	N = 203
	between		13.91	2.16	41.55	n = 6
Oil rents/GDP	overall	27.86	14.22	2.78	65.52	N = 204
	between		12.05	6.67	38.34	n = 6
GDP per Capita (constant 2010 US $)	overall	34095.02	21826.51	9907.34	113682	N = 169
	between		22314.63	16348.21	65712.68	n = 6
GDP per Capita growth (constant 20101 US $) percent	overall	-0.61	7.04	-25.62	22.41	N = 176
	between		1.79	-2.6	1.85	n = 6
(Domestic credit to private sector/GDP) percent	overall	38.32	17.11	6.8	93.55	N = 203
	between		11.44	24.56	56.12	n = 6
Inflation rate (percent)	between		2.55	17.32	24.36	n = 5
	overall	2.62	3.38	-4.86	15.05	N = 155
	between		0.94	1.53	3.77	n = 6
Labour force (number)	overall	2264265	2719871	216689	11800000	N = 141
	between		2660496	417324.6	7377795	n = 6
Political Instability	overall	2.69	1.46	0.9	6.41	N = 178
	between		0.36	2.15	3.14	n = 6
Corruption Perception Index	overall	3.46	0.53	2	4	N = 178
	between		0.29	3.15	3.82	n = 6

Source: Stata outcomes based on UNCTAD and Word Economic Indicators (World Bank) datasets

Table 10. Descriptive statistics for variables used (2003-2013)

Variable		Mean	Std. Dev.	Min	Max	Observations
FDI stock Outflows /GDP	overall	12.94	12.29	0.41	46.4	N = 66
	between		12.01	3.03	35.64	n = 6
FDI stock Inflows /GDP	overall	24.4	19.86	0.69	83.91	N = 66
	between		20.24	5.39	64.06	n = 6
Greenfield FDI inflows to non-oil sector/GDP	overall	2.91	4.47	0.04	27.31	N = 66
	between		3.22	0.6	9.15	n = 6
Greenfield FDI inflows to oil sector/GDP	overall	4.64	11.92	0	88.12	N = 66
	between		5.57	0.2	15.39	n = 6
Saving/GDP	overall	45.56	14.77	24.1	74.61	N = 66
	between		14.63	32.57	70.77	n = 6
Gross Fixed Capital Formation/GDP	overall	24.53	7.19	12.83	46.02	N = 66
	between		6.34	16.53	35.48	n = 6
(Domestic credit to private sector/GDP) percent	overall	48.14	14.1	28.23	84.47	N = 66
	between		11.55	36.36	60.33	n = 6
GDP per Capita growth (constant 2010 US $) percent	overall	-0.02	5.23	-14.79	15.95	N = 66
	between		2.05	-3.75	2.21	n = 6
Inflation rate	overall	8.42	11.27	-25.13	33.75	N = 66
	between		1.63	6.42	10.35	n = 6
Money Supply/GDP	overall	55.85	13.47	30.51	82.54	N = 66
	between		11.95	35.81	69.56	n = 6
Trade/GDP	overall	109.68	28.89	69.83	191.88	N = 66
	between		26.92	84.27	148.93	n = 6
Oil rents/GDP	overall	33.34	15.8	4.11	60.78	N = 66
	between		16.28	6.3	50.71	n = 6

Source: Stata outcome based on UNCTAD, Word Economic Indicators (World Bank) and Financial Times (FT) datasets.

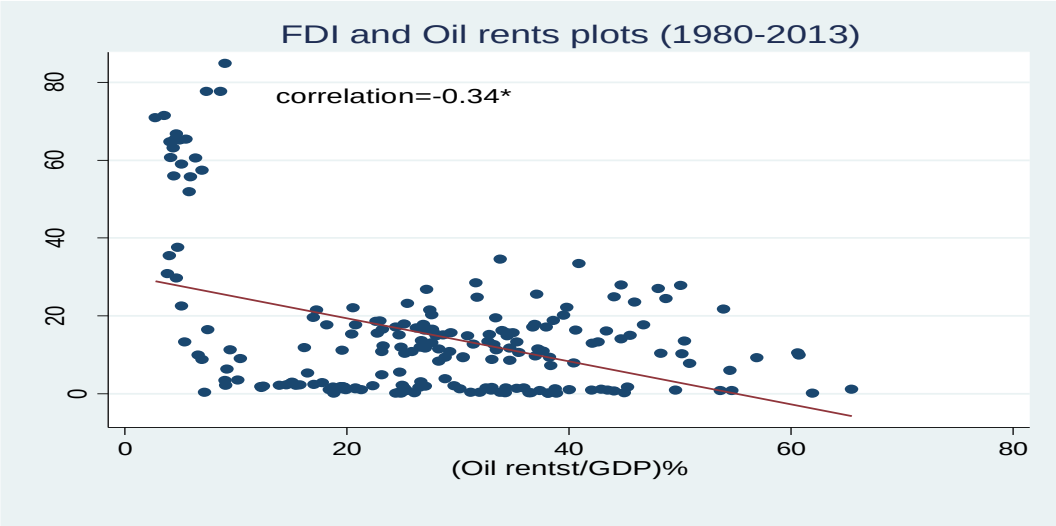
The correlation matrix shows that foreign direct investment had a negative and significant correlation with oil rents during 1980-2013 (see Table.11). This coefficient is -0.43. Also, Figure 11 shows a scatter plot that represents the association between oil abundance measured by oil rents-GDP share and FDI inflows in GCC countries during the same period. This figure indicates that more oil rents correlated with low FDI inflows. This gives an indication of *the FDI-natural resource curse* hypothesis. This correlation is consistent with previous studies such as those by Asiedu (2013) and Asiedu and Lien (2011). This relationship will be estimated and discussed in detail in Chapter 4 Section 4.2

Table 11. Correlation matrix for data from 1980 to 2013

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) FDI/GDP	1.000									
(2) Oil Rents/GDP	-0.430*	1.000								
(3) GDP_PC	-0.342*	0.039	1.000							
(4) GDP _PC_g	-0.199*	0.070	-0.095	1.000						
(5) DI/GDP	0.246*	-0.111	0.003	-0.073	1.000					
(6) PI	-0.251*	-0.023	-0.096	-0.013	-0.310*	1.000				
(7) Corruption	0.223*	-0.175*	0.001	0.061	-0.139	-0.268*	1.000			
(8) GFCF/GDP	0.124	-0.120	-0.155	-0.075	-0.043	0.151	-0.020	1.000		
(9) Inflation rate	-0.150	0.315*	0.294*	-0.066	0.060	-0.152	-0.043	0.191*	1.000	
(10) Labour	-0.097	0.322*	-0.250*	-0.026	-0.112	-0.023	0.210*	0.104	-0.010	1.000

Notes: (1) FDI is an inward stock to GDP, GDP_PC is GDP per capita (constant, 2010 US$), DI is domestic credit to the private sector, PI is political Instability and GFCF is gross fixed capital formation. The correlation coefficients are Pearson. (2) The pairwise correlations are calculated based on STATA software.15. (3) * shows significance at the .05 level

Figure 11. Correlation between FDI inflows and oil rents in GCC economies from 1980-2013



Source: Stata outcome based on UNCTAD and Word Economic Indicators (World Bank) datasets

Table 12 also provides the correlation matrix for the variables used between 2003 and 2013. This table reveals some interesting findings. It indicates that there is a significant and negative association between resource-related FDI (oil) and economic growth in the GCC economies (- 0.125), but FDI inflows to the non-resource sector have a positive correlation. Also, Figure 12 shows a negative relationship between oil-FDI and growth, reflecting the concept that greater concentration of FDI in resource-based industries leads to low levels of economic growth. However, Figure 13 suggests a positive correlation between non-oil FDI and economic growth in the GCC countries. This gives an indication of the *natural resource curse* hypothesis through FDI, and this is in line with past studies such as Abdul and Noy (2007), Vu et al. (2006), Vu and Noy (2009), (Vu et al., 2008) and Alfaro (2003). This relationship will be investigated and discussed in Chapter 4, Section 4.3.

Another interesting finding in Table 12 is the correlation between FDI and domestic investment (public and private). The correlation coefficient between oil-related FDI and

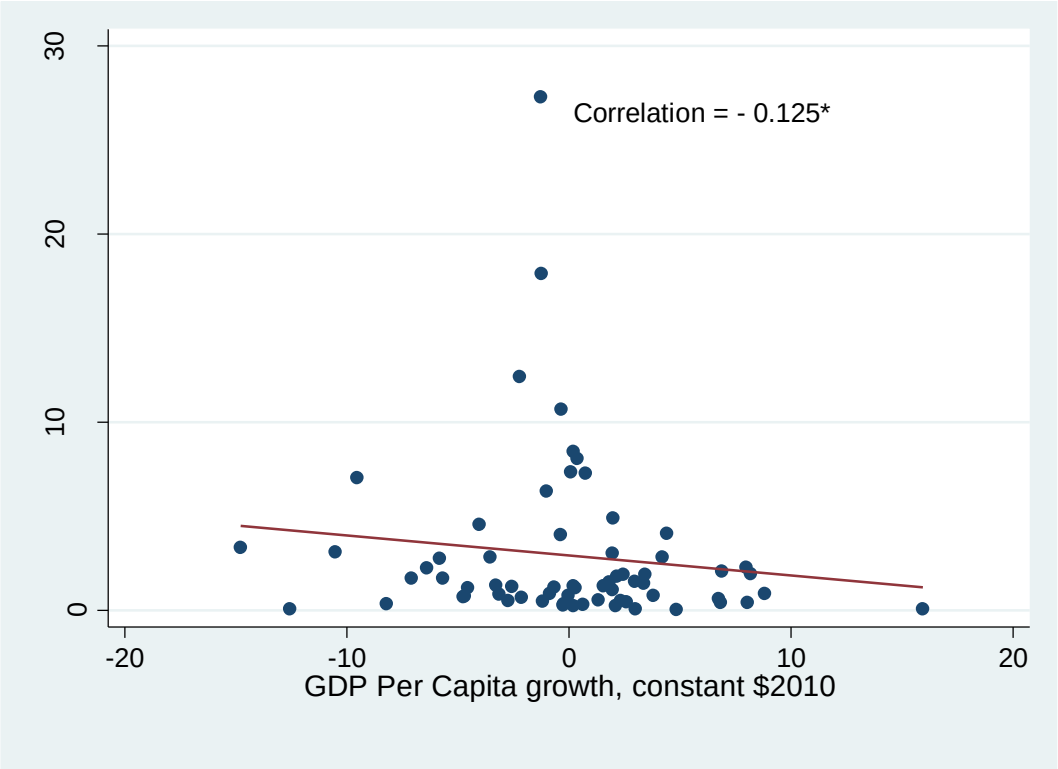
public domestic investment is significant and positive in the Gulf area, whereas it is negatively and significantly correlated with private domestic investment. These relationships will be estimated and explained in chapter 4, section 4.4.

Table 12. Correlation matrix of data from2003 to 2013

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) outsgdp	1.000										
(2) inwsgdp	0.774*	1.000									
(3) FDI non-oil/GDP	-0.156	-0.181	1.000								
(4) fdigoilgdp	0.059	-0.186	0.027	1.000							
(5) total_natural	-0.386*	-0.041	-0.053	-0.593*	1.000						
(6) GDP_PC	-0.071	0.322*	0.214	-0.080	0.076	1.000					
(7) GDP_PC_g	-0.289*	-0.294*	0.122	-0.125*	0.168	-0.012	1.000				
(8) DI/GDP	0.402*	0.308*	-0.259*	0.185	-0.312*	-0.014	-0.369*	1.000			
(9) GFCF/GDP	-0.142	-0.124	0.294*	0.340*	-0.220	0.300*	-0.030	-0.278*	1.000		
(10) inflation	-0.177	-0.158	0.070	-0.015	0.223	0.085	0.203	-0.357*	-0.080	1.000	
(11) moneysupply	0.296*	0.127	-0.153	0.203	-0.421*	0.076	-0.175	0.826*	-0.197	-0.402*	1.000

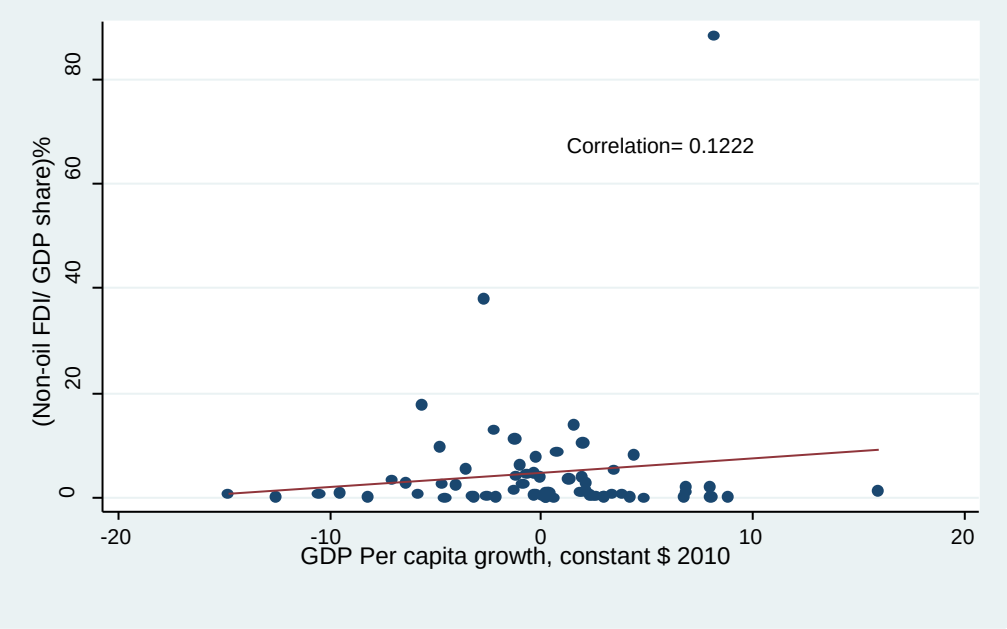
Notes: 1. FDI is an inward stock to GDP, GDP_PC is GDP per capita (constant, 2010 US$), DI is domestic credit to the private sector, PI is political Instability and GFCF is gross fixed capital formation. The correlation coefficients are Pearson. 2. The pairwise correlations are calculated based on STATA software.15. 3.* shows significance at the .05 level

Figure 12. Correlation of resource (oil) greenfield FDI and economic growth in GCC countries (2003-2013)



Source: Stata outcome based on UNCTAD and Word Economic Indicators (World Bank) datasets

Figure 13. Correlation between non-resource (non-oil) greenfield FDI and economic growth in GCC countries (2003-2013)



Source: Stata outcome based on UNCTAD and Word Economic Indicators (World Bank) datasets

Chapter 4 Empirical Results

4.1. Introduction

This section provides the empirical estimations of the proposed models[4] using STATA.15 software. The proposed relationships are as follows; FDI-natural resource relationship to test FDI-natural resource curse hypothesis, FDI-economic growth nexus and FDI-domestic investment association.

4.2. Determinants of aggregate and disaggregate FDI: the role of natural resources[5]

Several past papers have investigated the determinants of FDI inflows (inflows and outflows). These studies suggest that Multinational Corporations (MNCs) tend to direct their investments to countries with lower wages and abundant natural resources.

However, recent studies on FDI determinants have observed that countries endowed with a natural resource such as oil, diamonds, gas or gold attracted less FDI than resource-poor countries (Poelhekke & Van der Ploeg, 2010, 2013). In the context of the natural resource curse thesis, one might expect that abundant natural resources could attract FDI in resource industries but deter non-resource FDI.

Interestingly, there is a shortage of literature have investigated the possible impacts of natural resources on aggregate FDI and disaggregate FDI. Poelhekke and van der Ploeg (2013), in one of the first such studies, state "it is surprising that there is no research available on the effect of natural resources on both the composition and volume of FDI" (Poelhekke &Van der Ploeg, 2013: 1046).

[4] Each relationship will have an empirical specification of the model and will be discussed in the next sections.

[5] This empirical paper was published as; "What determines FDI inflow to MENA countries? Empirical study on Gulf countries: Sectoral level analysis". ***Research in International Business and Finance***, 44(C), pp.332-339. (https://doi.org/10.1016/j.ribaf.2017.07.101).

It is well known that underground natural resources in developing countries are extracted mainly by foreign firms because of a lack of locally-based technologies and know-how. At the same time, the resource sector is highly capital intensive. Multinational corporations in the oil industry tend to employ less domestic labour and try to monopolise the technology for this process, which leads to less spill-over to the host economy.

This section (the first empirical paper) formally examines the impacts of natural resources on total FDI and sectoral FDI, focusing on the oil-exporter counties of the GCC. Examining the effect of natural resources on foreign investors' decisions is a very important issue for host resource-rich economies that attempt to meet their diversification targets. This paper answers three main questions: (i) Does resource-based FDI crowd out or crowd in non-resource FDI? (ii) Does oil price volatility impact differently on sectoral FDI? (iii) Does institutional quality (corruption and political instability) matter for sectoral FDIs? To answer these questions, this study utilises two different datasets. The first is aggregate data on FDI inflows to GCC economies from UNCTAD, and the other is a unique panel data set from 2003 to 2013 on greenfield FDI by sector for six oil-dependent economies in the GCC.

4.2.1. Model specifications

Following the previous discussion in the literature review (Chapter 2), this study adopts an empirical model similar to that used in previous studies to explore the determinants of FDI inflows (FDI/GDP) for a sample of oil-rich countries with a specific emphasis on GCC economies. Following Poelhekke and van der Ploeg (2013), the model is formed as,

$$FDI_{i,t} = \alpha_0 + \alpha_1 Nat_{i,t} + \alpha_2 X_{i,t} + \mu_i + \varepsilon_{1i,t} \quad (4\text{-}1)$$

$$FDIR_{i,t} = \beta_0 + \beta_1 Nat_{i,t} + \beta_2 X_{i,t} + \mu_i + \varepsilon_{2i,t} \quad (4\text{-}2)$$

$$FDIN_{i,t} = \gamma_0 + \gamma_1 Nat_{i,t} + \gamma_2 X_{i,t} + \mu_i + \varepsilon_{3i,t} \quad (4\text{-}3)$$

Where: $FDI_{i,t}$, $FDIR_{i,t}$ and $FDIN_{i,t}$ are total FDI inflows (aggregated), resource greenfield FDI and non-resource greenfield FDI inflows respectively in country i at time t. $Nat_{i,t}$ refers to natural resource proxies of country i at time t. $X_{i,t}$ indicates the vector of other variables in country i at time t (income per capita, institutional quality inflation, trade openness and political instability) and $\varepsilon_{1i,t}$ are error terms of total FDI, resource FDI and non-resource FDI and μ_i is fixed time and country effect. The fixed effect term is used to account for unobserved (country level) effects: "country heterogeneity". There is an important issue with this specification; if the unobserved country-level effects are associated with explanatory variables, then FE is the appropriate model: otherwise, RE will be sufficient. This can be assessed subject to the Hausman test specifications, as mentioned in the methodology section in Chapter 3.

The hypothesis that the FDI-natural resource curse exists when $\alpha_1 < 0$ for aggregate FDI, and $\beta_1 > 0$ and $\gamma_1 < 0$. FDI is measured by FDI stock inflows in the GCC countries and natural resources are measured by two proxies; oil rents/real GDP and oil GDP/real GDP.[6]

Initially, two econometric techniques are applied to estimate the above equations: The fixed effects model (hereafter FE) and the random effects model (hereafter RE). Then, the analysis addresses endogeneity concerns by applying instrumental variables (hereafter IV) and limited information maximum likelihood (hereafter LIML) using several instruments proposed by previous literature. The validity and strength of instruments will be assessed through various diagnostic tests.

[6] Definitions and measurements are discussed in Chapter 3.

4.2.2. Aggregate determinants of FDI

Across two estimation methods, several variables are consistently significant determinants of FDI, namely; natural resources, trade openness, labour force, GDP per capita, political instability and corruption.

Starting with the interest variable natural resource proxy. Tables 13 and 14 present all results of the estimation, using oil rents and oil GDP as an alternative proxy for natural resource abundance in the long run and short run. The choice between FE and RE results is firstly considered. Although FE is preferred because of its ability to control for country-specific effects (heterogeneity), the estimations are subject to the Hausman test. As mentioned in Chapter 3, the null hypothesis of the Hausman test is that RE is appropriate, while the alternative hypothesis is that FE is an efficient estimation.

The Hausman test strongly rejects the null hypothesis (at a 5 percent level of significance) for the long run relationship model. Therefore, the FE model is appropriate. In the short run, however, the Chi-square of the Hausman test is insignificant. This means that RE is an efficient model. In both estimations, there is no major difference in the results, and all estimations are consistent for the two models.

The results in Tables 13 and 14 show that natural resources deter FDI inflows in the GCC; this result is highly statistically significant and has a negative relationship with FDI/GDP in all estimations. This means that FDI as a share of GDP decreases with higher natural resource abundance as measured by oil rents and oil GDP. The short run estimations show that one percent growth in natural resources (oil rents and oil GDP) reduces FDI inflows by 0.44 to 0.58 percent in the short run (see Table 14). This negative impact of natural resources becomes bigger in magnitude in the long run. Table 13 shows that a one percent increase in oil rents, for example, leads to about a 0.3 percent decrease in foreign investment in the GCC area. When the oil GDP ratio is used as a proxy for natural

resources, the negative effect become larger (-0.889). A one percent increase in oil production leads to a more than one percent fall in FDI inflows.(see column 4: RE model)

Table 13. Aggregate FDI inflows and natural resources relationship: long-run estimation.

	FE (1)	RE (2)	FE (3)	RE (4)
Log (oil rents/GDP)	**-0.287***	**-0.973*****		
	(0.207)	**(0.240)**		
Log (trade openness)	0.448***	0.631***	0.497***	0.687***
	(0.105)	(0.070)	(0.106)	(0.070)
Inflation rate	-0.030*	0.001	-0.032**	-0.000
	(0.015)	(0.026)	(0.015)	(0.027)
Log (Labour Force)	0.916***	0.635***	1.037***	0.623***
	(0.146)	(0.113)	(0.155)	(0.114)
Log (GDP Per Capita)	1.526***	0.358**	1.782***	0.145
	(0.272)	(0.178)	(0.295)	(0.176)
Political Instability	-0.089**	-0.332***	-0.081*	-0.379***
	(0.043)	(0.063)	(0.042)	(0.065)
Corruption (CPI)	-0.033	-1.049***	-0.033	-1.087***
	(0.109)	(0.166)	(0.107)	(0.166)
Log (Oil GDP/GDP)			**-0.889****	**-1.432*****
			(0.352)	**(0.360)**
constant	-22.596***	4.791*	-23.611***	5.055**
	(2.930)	(2.465)	(2.926)	(2.511)
Observations	172	172	172	172
R-squared	0.652	0.78	0.661	0.76
Hausman test for FE	116.19		117.62	
Chi2(p-value)	(0.000)		(0.000)	

Note: (1). Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1
(2). These estimations based on the UNCTAD data (1980-2013)

Table 14. Aggregate FDI inflows and natural resources relationship: short-run estimation.

	FE (1)	RE (2)	FE (3)	RE (4)
D Log (oil rents/GDP)	**-0.451*** **	**-0.448*** **		
	(0.133)	**(0.132)**		
D Inflation rate	-0.006	-0.006	-0.007	-0.007
	(0.008)	(0.008)	(0.008)	(0.008)
D Log (Labour Force)	-0.082	-0.276	0.169	-0.208
	(1.874)	(1.632)	(1.896)	(1.651)
D Log (GDP Per Capita)	0.343	0.297	0.465	0.381
	(0.319)	(0.311)	(0.366)	(0.354)
D Log (Oil GDP/GDP)			**-0.629*** **	**-0.587*** **
			(0.217)	**(0.214)**
constant	0.097**	0.100**	0.102**	0.109***
	(0.045)	(0.041)	(0.045)	(0.041)
Observations	191	191	191	191
R-squared	0.072	0.079	0.055	0.09
Hausman test for FE Chi2(p-value)	2.79(0.72)		2.50(0.64)	

Note: (1). Standard errors are in parenthesis *** p<0.01, ** p<0.05, * p<0.1
(2). These estimations based on the UNCTAD data (1980-2013).

So far, the estimations have not considered the problem of endogeneity. It is important to note that the regressions might be biased. There is a possibility that unobserved variables may affect both FDI and natural resources (Oil-GDP/GDP). Also, oil production depends on the extraction process which is done by foreign firms; this relationship leads to reverse causality (simultaneity). This study applies two alternative methods for further robustness. The first is an instrumental variables estimator. This method requires a valid instrument associated with the endogenous regressor and not correlated with the error term. (see Chapter 2). It is difficult to find such an instrument. Consistent with the previous criteria, this study follows past leading papers on determinants of FDI to choose the proper instruments. Further, several diagnostic tests are performed for the validity of instruments, including the Sargan test. However, recent studies argue that these diagnostics tests could be biased and may lead to inaccurate results. Therefore, the Cragg-Donald (CD) statistics are also performed to check whether the instruments are weak.

This study treats natural resource variables as an endogenous variable, so that oil-GDP and oil rents/GDP become endogenous regressors in the estimations. Testing for the endogeneity of these two variables found that the null hypothesis that oil GDP and oil rents are exogenous was rejected at 5 percent.

Following previous studies, the lagged value of natural resource variables (endogenous variables) is used as an instrumental variable because it is argued that this variable is strongly exogenous. Its exogeneity can be rationalized as follows: oil production is usually extracted by foreign firms in GCC countries, and using their technologies, making oil production relatively independent of unobserved development indicators. Also, lagged values are arguably exogenous (Perez-Sebastian & Raveh, 2015).

Also, we follow Poelhekke and van der Ploeg (2013) by using trade openness as an extra instrument. In trade, costs and time to start up a business are often used.

Based on Sargan statistics, the null hypothesis that the instruments are valid (uncorrelated with the error term). The C-D statistics suggest that the instruments are acceptable in the sense that they are not weak. More specifically, the C-D statistics for oil-GDP estimation (in Table 15, column 3) of 19.59 is greater than 19.1 (critical value for 10 percent). The C-D statistics for Oil-GDP estimation (in Table 15, column 3) of 8.94 is greater than 8.75 (critical value at the 10 percent level of significance).

Based on the IV results, it is clear that the negative relationship between FDI and natural resources is still valid, and this confirms the FE and RE results. It is worth noting that the negative effect is bigger in terms of magnitude. A one percent increase in natural resource variables (oil-GDP/G and oil rents/GDP) leads to a more than 1 percent (1.005 percent and 1.383 percent respectively) decrease in FDI inflows in the GCC region. For further robustness, the LIML method is performed. The LIML results are reported in Table 15, columns 3 and 4. These results show that there is an FDI-natural resource curse, but that

the negative effects of natural resources are not significant. All the above results will be discussed along with the previous literature in the next section (4.2.4).

For the other control variables, FE and RE results show the expected sign of these. For instance, trade openness has a positive and significant impact on FDI inflow in GCC countries. Also, GDP per capita promotes FDI inflows. Countries with higher trade and greater size of economy attract more FDI inflows. These are not surprising results and are in line with past studies such as Asiedu (2002; 2006).

Our results show that institutional quality plays a significant role in attracting FDI. The impact of political instability is significant and negative for all the results. High political instability deters foreign investments in the GCC, and this effect is robust for all estimators. Similarly, corruption is a detrimental factor for FDI, because it has negative effects on FDI inflows. These results are consistent with the ongoing literature, including Barassi and Zhou (2012); Hakkala et al. (2008); Kolstad and Wiig (2013); Wei (2000); Wei and Shleifer (2000). The question now is of whether the impact of corruption varies across sectors. The next section answers this question when the determinants of sectoral FDI are discussed.

Table 15. Aggregate FDI inflows and natural resources relationship: IV and LIML estimations

VARIABLES	(1) LIML	(2) LIML	(3) IV	(4) IV
Log (Oil-GDP/GDP)	**-0.150**		**-1.005****	
	(0.782)		**(0.449)**	
Inflation rate	0.0330	0.0564*	0.0439	0.0521
	(0.0335)	(0.0318)	(0.0328)	(0.0320)
Log (Labour Force)	0.0639	0.0611	0.110	0.0602
	(0.112)	(0.101)	(0.108)	(0.102)
Log (GDP per capita)	0.275	0.515**	0.231	0.475**
	(0.221)	(0.220)	(0.220)	(0.220)
Political Instability index	-0.491***	-0.504***	-0.535***	-0.501***
	(0.0852)	(0.0728)	(0.0792)	(0.0737)
Corruption Index (CPI)	-0.959***	-0.881***	-0.947***	-0.895***
	(0.206)	(0.200)	(0.207)	(0.202)
Log (Oil rents/GDP)		**-1.668*****		**-1.383*****
		(0.463)		**(0.382)**
Constant	5.762	13.12***	8.949***	11.77***
	(3.908)	(3.344)	(3.117)	(3.133)
Sargan Test			3.23	4.58
(*p*-value)			(0.221)	(0.112)
Cragg-Donald statistic			8.949	19.59
Endogeneity test of endogenous regressors (oil rents and oil GDP/GDP)			12.49 (0.000)	4.262 (0.000)
R-squared	0.244	0.290		
Number of N	6	6	6	6
Observations	172	172	172	172

Note: (1). Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. (2) aggregate FDI data based on the UNCTACD data set during (1980-2013). (2) The endogeneity test is for testing whether the variable of interest is endogenous or not. This test based on the outcomes of the IV(xtivreg2) regression.

4.2.3. Disaggregate determinants of FDI

This section provides a more detailed empirical investigation of the determinants of sector-level FDI, focusing on the role of natural resources. FDI is divided into two main sectors; resource and non-resource sectors. The main objective is therefore to examine the importance of natural resources (measured by oil rents and oil GDP) as a determinant of FDI and to assess whether there is evidence for a negative effect of natural resources on non-resource FDI but a positive impact on the inflow of resource FDI, using detailed sector level data on greenfield FDI inflows. In other words, the investigation tests whether

natural resource abundance crowds out (deters) non-resource FDI, but crowds in (attracts) resource FDI.

Tables 16 and 17 present the estimations of the FE and RE models. Again, the choice between FE and RE is based on the specifications of the Hausman test. The Hausman test statistic (Chi^2 statistic and p-value) rejects the null hypothesis, and FE is, therefore, an appropriate model for the estimations. In Table 16, the oil GDP/GDP ratio is used as a proxy for natural resources. It is obvious from this table that natural resources attract more resource FDI but deter resource-based FDI inflows in GCC economies. An increase in oil GDP ratio by one percent leads to a 0.22 percent increase in foreign investment in the oil sector, but to a fall in non-resource FDI inflows of about 0.0121 percent. We use the share of oil rent in the GDP as a proxy of natural resources. Then, we re-estimated the mode l again. The results are reported in Table 17. Table 17 shows clearly that natural resources crowd out FDI in the non-resources sector. The negative effect of oil rents on non-resource FDI is greater than the positive effect on resource FDI, which means that the total effect of natural resources on FDI is negative. When oil rents rise by one percent, non-resource FDI decreases by 0.686 percent and FDI in the resource sector increases by 0.292 percent. The coefficients are statically significant at 10 percent.

Another interesting result in these estimations is the impact of corruption. The results show that corruption, measured by the corruption perception index (CPI) has a positive and significant effect on resource-based FDI inflows. Foreign firms increase their investments in resource sectors where corruption is high. Resource FDI goes up by about 0.5 percent when corruption increases by 1 point. See Tables 16 and 17.

Table 16. Disaggregate FDI inflows and natural resources relationship (FE and RE models) oil GDP

VARIABLES	(1) Resource FDI-FE	(2) Resource FDI-RE	(3) Non-Resource FDI-FE	(4) Non-Resource FDI-RE
Log(oil-GDP/GDP)	**0.226*** **	**0.418*** **	**-0.0121***	**-0.0179***
	(0.0784)	**(0.104)**	**(0.0383)**	**(0.0535)**
Inflation rate	0.00838	0.00138	0.0254	0.0350*
	(0.0387)	(0.0369)	(0.0190)	(0.0191)
Log (GDP per capita)	-0.365	-1.058***	0.120	0.368*
	(1.07)	(0.378)	(0.451)	(0.195)
Log (labour force)	0.323	-0.276	0.5057*	0.221**
	(0.104)	(0.189)	(0.268)	(0.0974)
Log(trade openness)	0.68	0.389*	0.181**	0.314**
	(0.165)	(0.228)	(0.0807)	(0.113)
Political instability index	−0.374	-0.0971	-0.354**	-0.640***
	(0.368)	(0.364)	(0.173)	(0.188)
Corruption index (CPI)	0.152**	0.444*	0.0666	-0.244
	(0.420)	(0.375)	(0.229)	(0.194)
Constant	12.34	12.15***	-12.19**	-0.232
	(11.30)	(4.000)	(5.300)	(2.066)
Observations	60	60	60	60
R-squared	0.170		0.272	
Number of n	6	6	6	6
Hausman test for FE Chi^2(*p*-value)	22.02 (0.000)		30.55 (0.000)	

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 17. Disaggregate FDI inflows and natural resources relationship (FE and RE models) oil rents

VARIABLES	(1) Resource FDI-FE	(2) Resource FDI-RE	(3) Non-Resource FDI-FE	(4) Non-Resource FDI-RE
Log (Oil rents/GDP)	**0.292***	**0.280****	**-0.686***	**-0.628*****
	(0.340)	**(0.179)**	**(0.379)**	**(0.199)**
Inflation rate	-0.0157	0.00682	-0.00965	0.0493***
	(0.0406)	(0.0435)	(0.0183)	(0.0181)
Log (GDP per capita)	1.147	0.0296	1.190**	0.443***
	(1.033)	(0.307)	(0.466)	(0.128)
Log (labour force)	0.0314	0.0649	0.985***	0.166*
	(0.614)	(0.210)	(0.277)	(0.0874)
Log(trade openness)	0.575	-0.268	0.341	0.114
	(0.252)	(0.206)	(0.650)	(0.124)
Political instability index	0.931**	0.142	-0.329**	-0.445**
	(0.360)	(0.437)	(0.162)	(0.182)
Corruption index (CPI)	0.562***	0.538	0.0498	-0.220
	(0.0182)	(0.427)	(0.217)	(0.178)
Constant	9.808	1.820	-18.08***	1.262
	(13.46)	(3.609)	(6.072)	(1.503)
Observations	60	60	60	60
R-squared	0.161		0.319	
Hausman test for FE Chi2 (p-value)	29.25 (0.000)		29.70 (0.000)	
Number of N	6	6	6	6

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The previous results could be biased as a result of unobserved factors. In other words, the results may suffer from the problem of endogeneity. Therefore, the re-estimation of the model was performed by applying IV and LIML methods for further robustness. Following Poelhekke and van der Ploeg (2013), we use the lagged natural resources and trade openness as instruments of the endogenous variables (natural resource proxies). The validity of the instruments is checked by the Sargan test. Sargan Chai2 is insignificant (0.33 and 0.38), which means that the null hypothesis is rejected, and the instruments are valid. It is important also to reject the strength of the instrumental variables. Therefore,

the C-D test is applied. The C-D statistics show that the instruments are not weak. See Table 18.

Table 18 reports the results of the IV estimations. It shows that the impact of natural resources (oil GDP and oil rents) on resource FDI is positive and significant. This means that more natural resources lead to more FDI in the oil industry. However, the natural resource has negative and insignificant effects on non-resource FDI.

Table 18. Disaggregate FDI inflows and natural resources relationship (IV estimations)

VARIABLES	(1) IV FDIR	(2) IV FDINR	(3) IV FDIR	(4) IV FDINR
Log (oil-GDP/GDP)	**0.510*** **	**-0.0876**		
	(0.117)	**(0.0592)**		
Log (oil rents/GDP)			**0.953*** **	**-0.228**
			(0.360)	**(0.880)**
Inflation rate	−0.00167	0.0226	-0.0189	-0.00156
	(0.0369)	(0.0187)	(0.0161)	(0.0393)
Log (GDP per capita)	1.628***	−0.155	0.685**	0.418
	(0.506)	(0.256)	(0.312)	(0.761)
Log (labour force)	−0.0348	0.229**	0.815***	-0.975**
	(0.216)	(0.109)	(0.179)	(0.438)
Political instability index	−0.0606	−0.382*	0.0910	-0.0870
	(0.409)	(0.207)	(0.520)	(1.270)
Corruption Index (CPI)	0.767*	0.187	0.486**	0.00813
	(0.449)	(0.227)	(0.203)	(0.495)
Constant	14.07***	2.375	-8.235	1.390
	(4.315)	(2.186)	(6.939)	(16.95)
Observations	54	54	54	54
Number of N	6	6	6	6
Sargan Test (p-value)	44.27(0.335)	43.11(0.381)	59.74(0.101)	50.10(0.351)
Cragg-Donald statistic	16.27	11.428	10.265	12.370
Endogeneity test of endogenous regressors(natural resource variable)	27.84 (0.000)	12.96 (0.000)	32.93 (0.000)	12.402 (0.000)

Note: (1) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 (2) FDIR indicates FDI in the resource sector and FDINR refers to FDI in the non-resource sector. (3) The endogeneity test is for testing whether the variable of interest is endogenous or not. This test based on the outcomes of the IV(xtivreg2) regression.

To give the results further robustness, we estimate the model again with the LIML method. The LIML results, presented in Table 19, provide strong support for the crowding-out effect of natural resources. From Table 19, oil GDP/GDP has positive and significant effects on resource FDI, but negative effects on non-resource FDI. If oil GDP increases by one percent, resource FDI rises by 0.45 percent. This positive impact is greater in terms of magnitude when using oil rents/GDP as a measure for natural resources.

FDI inflows to the oil sector increase by about 2 percent when the oil rent share increases by one percent, but non-resource FDI falls by 1.027 percent.

Furthermore, the impact of corruption remains positive and significant on resource-FDI inflows and supports the previous results. These results suggest that foreign firms are attracted more to countries with a high level of corruption, and in particular resource-rich economies such as those of the GCC area (see the next section: discussion).

Table 19. Disaggregate FDI inflows and natural resources relationship (LIML estimations)

VARIABLES	(1) LIML Resource FDI	(2) LIML Non-Resource FDI	(3) LIML Resource FDI	(4) LIML Non-Resource FDI
Log (Oil rents/GDP)	**1.682*** **	**-1.027*** **		
	(0.509)	**(0.266)**		
Log (oil- GDP/GDP)			**0.445*** **	**-0.581*** **
			(0.105)	**(0.0576)**
Inflation rate	0.0310	0.0422**	-0.00299	0.0216
	(0.0320)	(0.0167)	(0.0350)	(0.0185)
Log (GDP Per capita)	1.543***	0.00950	1.116***	0.313
	(0.347)	(0.182)	(0.379)	(0.201)
Log (labour force)	0.454**	0.0422	0.110	0.178*
	(0.202)	(0.106)	(0.201)	(0.107)
Political instability index	0.143	-0.315*	-0.326	-0.599***
	(0.340)	(0.178)	(0.357)	(0.189)
Corruption index (CPI)	0.504*	-0.0503	0.409*	-0.107
	(0.323)	(0.169)	(0.372)	(0.197)
Constant	22.57***	7.097***	12.01***	0.212
	(4.665)	(2.442)	(3.981)	(2.107)
Observations	54	54	54	54
Number of N				
R-squared	0.481	0.436	0.306	0.229

Notes: Note: (1) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. (2) FDIR indicates FDI in the resource sector and FDINR refers to FDI in the non-resource sector.

Next, the impacts of oil price volatility on FDI inflows to GCC economies were tested. Following the previous literature, this study measures oil price volatility by taking the standard deviation of oil prices over a three-year interval. The empirical results are reported in Table 20. Oil price volatility is associated negatively with resource-FDI. The results in Table 20 show that high fluctuations in oil prices cause a significant decrease in resource FDI inflows, but an insignificant increase in non-resource FDI. The negative effect of oil price volatility is still significant after controlling for the endogeneity issue. A one percent increase in oil price volatility will lead to a 0.526 percent reduction in oil-related FDI inflows. The negative impact of oil price fluctuations still valid when

performing the LIML estimation. Non-resource FDI, by contrast, is affected positively by oil price fluctuations, but this impact is insignificant and very small.

Table 20. FDI (resource and non-resource) and oil price volatility

Variables	(1) FE FDIR	(2) FE FDINR	(3) IV FDIR	(4) IV FDINR	(5) LIML FDIR	(6) LIML FDINR
Log (Labour Force)	0.890***	0.144	0.244	0.564**	1.056***	0.0940
	(0.249)	(0.125)	(0.689)	(0.309)	(0.261)	(0.132)
Log (GDP per Capita)	-0.239	0.392***	2.211	0.625	-0.255	0.328**
	(0.270)	(0.136)	(0.928)	(0.417)	(0.281)	(0.142)
Corruption	0.630*	-0.185	0.459	0.174	0.596*	-0.0483
	(0.341)	(0.171)	(0.453)	(0.203)	(0.362)	(0.183)
Political Instability	-0.703**	-0.481***	0.515	-0.0897	-0.920***	-0.449***
	(0.325)	(0.163)	(0.371)	(0.166)	(0.332)	(0.167)
Inflation Rate	0.00381	0.0338*	0.00740	0.00940	0.00351	0.0197
	(0.0370)	(0.0186)	(0.0321)	(0.0144)	(0.0379)	(0.0192)
Oil price volatility	**-0.392***	**0.164**	**-0.526*****	**0.0222**	**-0.392***	**0.164**
	(0.223)	**(0.100)**	**(0.127)**	**(0.0639)**	**(0.223)**	**(0.100)**
Constant	2.465	-0.549	14.69	-8.747*	1.835	0.0326
	(2.836)	(1.423)	(11.14)	(5.004)	(2.921)	(1.475)
R-squared	0.282	0.242			0.185	0.282
Hausman Test	29.25	29.70			-	-
	(0.000)	(0.000)				
Saragan Test	-	-	57.78	60.57		
			(0.130)	(0.08)		
Cragg-Donald statistic			10.26	12.30		
Endogeneity test of endogenous regressor (oil price volatility)	-	-	0.07	0.221		
			(0.77)	(0.638)		
Observations	65	65	65	65	59	59
Number of N	6	6	6	6	6	6

Notes: (1) FDIR refers to FDI in the resource sector and FDINR indicates the FDI inflows in the non-resource sector. (2) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1; (3) Data on 'FDI Greenfield' are collected from fDi intelligence, Financial Times, and covers period 2003-2013. The fDi intelligence started tracking greenfield FDI in each sector for each country in 2003 only and does not provide free access data. The oil-price volatility data is from Michael L. Ross Dataverse https://dataverse.harvard.edu/file.xhtml?fileId=2431785&version=2.0.

4.2.4. Summary and Discussion

The aggregate results of the study find that there is a negative relationship between natural resources and gross FDI inflows in GCC countries. This result provides evidence for the FDI-natural resource curse hypothesis. The results are consistent with Asiedu (2013) and Asiedu and Lien (2011). There are several reasons for this negative relationship. The first is based on the idea of the Dutch disease, in which resource booms lead to the appreciation

of the domestic currency. This impacts negatively on the country's export competitiveness at world prices, and thereby crowds out investments in non-natural resource tradable sectors (Asiedu, 2013; Corden & Neary, 1982). The second reason is related to the characteristics of natural resources. Natural resource prices, in particular, oil, are highly volatile (booms and busts), which means that investment in this sector is vulnerable to external shocks. All of these factors cause macroeconomic instability and therefore decrease FDI.

For the disaggregated-level FDI-natural resource relationship, the findings show that natural resources attract more FDI in the resource sector but deter FDI inflows in the non-resource sector. These results support the crowding-out effect hypothesis, and are in line with Poelhekke and van der Ploeg (2013). In GCC countries, FDI is concentrated in resource sectors, such as oil and hydrocarbons, which makes other production factors move from the non-resource sector. FDI is less attracted to other sectors such as manufacturing and services, because these sectors are less competitive in the global market.

Another interesting result of this study is that the effect of corruption varies across sectors. Corruption has a positive and significant effect on resource FDI. This result suggests that low institutional quality and corruption may attract FDI in the resource sector. Elected corrupted politicians and oil multinational corporations join together to cream off natural oil revenues if there is an absence of transparency (Poelhekke and Van der Ploeg, 2010; 2013). This allows foreign firms, and in particular, oil firm to extract and access natural resources and make high profits. The other side of this picture is that GCC countries impose a very low tax rate (almost no tax) on foreign firms. These results are in line with Kolstad and Wiig (2013); Wiig and Kolstad (2010) and Guidolin and La Ferrara (2007).

4.3. FDI and economic growth: does the resource sector matter?

Since the seminal work by Wallis (1968) on the FDI-economic growth relationship, the FDI-led-growth hypothesis has attracted significant attention from practitioners and academicians. Typically, FDI is perceived to be a blessing for economic growth, rather than a curse. FDI is seen to work as a transmission channel for advanced technology and the introduction of a new capital at a lower cost (Borensztein et al., 1998). However, this argument has been far from conclusively accepted, and recent studies have argued that FDI may inhibit economic growth via negative spillovers. Similarly, Carkovic and Levine (2002) observe that FDI does not generate a robust positive effect on economic growth. For instance, in the case of Saudi Arabia, Sadik and Bolbol (2001) conclude that FDI has a negative influence on GDP growth. This adverse effect could stem from the fact that this foreign investment does not meet the criteria for multinational corporations and might be a result of misallocation of resources.

It has been highlighted that investment in certain sectors (such as mining) may crowd out FDI in other sectors, such as manufacturing (Cazzavillan & Olszewski, 2012; Kolstad & Villanger, 2008; Mendoza, Siriban, & Doytch, 2013).

This section (the second empirical study) aims to test whether greenfield FDI inflows in different sectors yield varying impacts on economic growth. The focus is on six oil-exporting economies in the Gulf Cooperation Council (GCC) from 2003 to 2013. The study also tests whether total FDI has positive or negative effects on economic growth.

4.3.1. Model specifications

Following on from existing literature, this study adopts an empirical model similar to that used in previous studies to explore the FDI-economic growth relationship for a sample of

oil-rich countries, with a specific emphasis on GCC economies. Based on Alfaro (2003) and Borensztein et al. (1998), the model is formulated as,

$$Growth_{i,t} = \alpha_0 + \alpha_1 Intial\ GDP_t + \alpha_2 FDI_{i,t} + \alpha_3 X_{i,t} + \mu_i + \varepsilon_{1i,t} \quad (4\text{-}4)$$

$$Growth_{i,t} = \beta_0 + \beta_1 Intial\ GDP_t + \beta_2 FDI_{i,t,j} + \beta_3 X_{i,t} + \mu_i + \varepsilon_{2,t} \quad (4\text{-}5)$$

Where $Growth_{i,t}$ is the annual growth of real GDP per capita (constant at 2010, US dollars), $Intial\ GDP_t$ is the initial GDP per capita in year t, which is the year 2003, and $FDI_{i,t}$ is total greenfield FDI inflows to country i in year t. $FDI_{i,t,j}$ is greenfield FDI inflows in country i in year t to sector j. As discussed in Chapter 3 that the focus are resource and non-resource sectors. Therefore, j will indicate resource and non-resource sectors accordingly. $X_{i,t}$ is a vector of control variables chosen based on previous empirical studies. α (alphas) and β (betas) are the estimated parameters. $\varepsilon_{1,t}$ and $\varepsilon_{2,t}$ are errors terms of total FDI, sectoral FDI (resource FDI and non-resource FDI) respectively, while μ_i is the fixed time and country effect. The fixed effect term is to account for unobserved (country level) effects "country heterogeneity".

We hypothesise that FDI in the resource sector has a negative effect on economic growth and non-resource FDI has insignificant or little impact on economic growth. If this is the case, then the total impact of FDI inflows is negative. This gives support to the natural resource curse hypothesis through FDI.

4.3.2. Disaggregate FDI- economic growth nexus

According to Wang (2009), one potential reason for these ambiguous outcomes is the use of total FDI inflows rather than sectoral FDI. Also, this negative effect of FDI on economic growth motivates the researcher to explore its source. Therefore, this section analyses the effects of sectoral FDI on economic growth in GCC economies.

Table 21 presents the results of FE and RE estimations for the impact of resource FDI and non-resource FDI on economic growth in the GCC countries from 2003-2013. Table

21 reveals several interesting results for the impacts of FDI on GDP per capita growth. Regression 1, Table 21 reports the FE results. This regression shows that FDI in the resource industry, which is mainly oil in this case, has a significant and negative effect on economic growth. Both estimations are reported in Table 21; FE and RE, but the choice between these two models is subject to the Hausman test. The Chi2-squared statistic of the Hausman test and p-value reject the null hypothesis. Therefore, the FE model is an appropriate model. The coefficient of -0.205 implies that a 1 percent increase in resource-FDI is associated with a 0.205 percent decrease in GDP per capita growth. The relationship between non-resource-FDI and economic growth is positive but insignificant. The negative impact of oil FDI is less when the RE model is applied (-0.068), and significant only at a 10 percent level of significance. Further, FDI inflows to the other sectors (non-resource FDI) has an insignificant contribution to economic growth in these economies. It is clear from the results that the negative impact of resource-FDI is larger than that of non-resource FDI.

Table 21. Sectoral FDI and economic growth estimations (fixed and random)

	(1) FE GDP per capita growth	(2) RE GDP per capita growth	(3) FE GDP per capita growth	(4) RE GDP per capita growth
GDP initial	-0.800***	-0.082	-0.822***	-0.117*
	(0.113)	(0.060)	(0.139)	(0.060)
Log (FDIR)	**-0.205*** **	**-0.068***		
	(0.046)	**(0.035)**		
Log (capital formation)	0.090	0.077	0.137	0.120**
	(0.073)	(0.057)	(0.089)	(0.057)
Log (population Growth)	-0.032	0.001	-0.006	0.006
	(0.030)	(0.041)	(0.036)	(0.045)
Log (government consumption)	0.497***	-0.064	0.309**	0.086*
	(0.107)	(0.046)	(0.119)	(0.046)
Log (FDINR)			**0.008**	**-0.018**
			(0.020)	**(0.020)**
_cons	-2.566***	0.327	-1.052	0.311
	(0.714)	(0.254)	(0.787)	(0.271)
Observations	54	54	54	54
R-squared	0.676		0.523	
Hausman test	85.91		39.55	
Chi2 (p-value)	(0.000)		(0.000)	
Obs.	54	54	54	54

Note: Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

The above results may suffer from an endogeneity problem. In other words, FDI and economic growth could have a reverse causality. This causality results from an endogenous FDI determination. Based on the most basic conventional FDI theories, developed countries tend to direct their broad investment to poorer economies that have a high return on capital (Edwards, 1990). Thus, any unobserved factor that increases the rate of return on capital will simultaneously foster economic growth and attract more FDI. In this case, there would be a correlation between FDI and the error term, which leads to a biased estimated coefficient (Borensztein et al., 1998). To overcome this issue, two methods are applied that could control for the possible endogeneity: the IV and LIML estimations. In reality, it is difficult to find effective instruments that satisfy the main

criteria; no correlation with the error term, but the correlation with FDI (Wooldridge, 2010).

Following Alfaro (2003), Alfaro et al. (2004) and Borensztein et al. (1998), lagged values are used for resource and non-resource FDI as an instrumental variable. The reason for using lagged FDI is that lagged values are arguably exogenous. The instruments also include the log value of the land area and a political institutional variable (political instability and corruption perception index) (Wang, 2009; Wang & Sunny Wong, 2009; Wang & Wong, 2009). We additionally perform the Sargan test and the C-D test to ensure that the instruments are acceptable.

Table 22 reports IV and LIML estimates. The results do not change in terms of the sign of resource FDI coefficient (FDIR), but the negative impact of resource-oriented FDI is greater than the coefficient in FE and RE estimations. Table 22 column 3 shows that the growth of GDP per capita in GCC economies falls by about 0.508 percent when oil sector FDI increases by 1 percent, while again, non-resource FDI inflows have no significant effect on economic growth. The Sargan test demonstrates that the instruments are valid. This validity is confirmed by the C-D statistic, in which the C-D statistic 12.25 is greater than the critical values at 5 percent (10.20).

For further robustness, the LIML estimation is applied. Table 22 column 4 confirms the adverse relationship between economic growth and FDI in the oil sector. However, the magnitude of the coefficient is lower compared to the IV coefficient. The possible reasons behind this negative relationship will be discussed in Section 4.3.4.

Table 22. Sectoral FDI and economic growth estimations (IV and LIML)

VARIABLES	(1) IV GDP Per capita growth	(2) LIML GDP Per capita growth	(3) IV GDP Per capita growth	(4) LIML GDP Per capita growth
Log (FDINR)	**-0.0452**	**-0.0464**		
	(0.0515)	**(0.0626)**		
Initial GDP	-0.777***	-0.120**	-0.778***	-0.0819
	(0.145)	(0.0573)	(0.153)	(0.0726)
Log (capital formation)	0.177*	0.134**	0.00977*	0.0763
	(0.0969)	(0.0621)	(0.122)	(0.0717)
Log (population growth)	0.0151	0.0280	-0.0746	0.00145
	(0.0411)	(0.0633)	(0.0555)	(0.0406)
Log (consumption)	0.303**	-0.0816*	0.776***	0.0635
	(0.120)	(0.0444)	(0.289)	(0.0555)
Log (FDIR)			**-0.508***	**-0.0686***
			(0.279)	**(0.101)**
Constant		0.198		0.326
		(0.354)		(0.251)
R-squared	0.444	0.115	0.334	0.199
Sargan test (p-value)	3.95(0.13)	---	0.633(.72)	---
Cragg-Donald statistic	12.25	---	10.67	---
Endogeneity test of endogenous regressor (FDI"Resource and non-Resource")	10.502 (0.013)	---	---	---
Observations	54	54	54	54
Number of N	6	6	6	6

Note: (1) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 (2) FDIR indicates FDI in the resource sector and FDINR refers to FDI in the non-resource sector. (3) The endogeneity test is for testing whether the variable of interest is endogenous or not. This test based on the outcomes of the IV(xtivreg2 code in SATA.15) regression.

4.3.3. Aggregate FDI-economic growth nexus

In this section, the total impact of FDI on economic growth in GCC economies is tested. Total FDI is defined in this section as the summation of resource greenfield FDI and non-resource greenfield FDI. The main purpose of this exercise is to identify whether the negative effects of resource FDI inflows dominates the total effect of FDI, which leads to low growth. In other words, we investigate whether there is a 'resource curse' for aggregate FDI.

Therefore, the model is re-estimated using total greenfield FDI with FE, IV, and LIML estimations. The results of these estimations are reported in Table 23. The results suggest that total FDI has a negative and significant impact on economic growth in the GCC economies.

Table 23 columns 1 and 2 present the results of the estimations, including all of the variables, and using FE and RE models. The Hausman test suggests that the FE model is an appropriate estimation, because the null hypothesis is rejected at 5 percent. Based on the FE estimation, a negative and statistically significant relationship is found between total greenfield FDI and economic growth performance in GCC economies. The results show that when FDI inflows increase by 1 percent, economic growth falls by 0.135 percent.

Several robustness tests are carried out. The exogeneity of independent variables is checked. In the belief that FDI may be an endogenous variable, the endogeneity test is carried out. This test confirms the assumption that FDI is endogenous in the model. As stated previously, there is a possible reverse causality running from FDI to economic growth and vice-versa (the simultaneity issue). Thus, we instrumentalise FDI by using lagged FDI, political instability and corruption perception index (Borensztein et al., 1998; Wang, 2009; Wang & Sunny Wong, 2009; Wang & Wong, 2009). It has been established that the instrumental variables are valid and not overidentified, by applying the Sargan test. The Sargan statistic is insignificant, which means rejection of the null hypothesis (that instruments are overidentified). Further, the C-D test was applied to check the strengths of the instrumental variables. The Cragg-Donald Wald F statistic is 11.45, greater than the Stock-Yogo critical values, at 10 percent (9.08).

Interestingly, when controlling for the endogeneity issue by applying the IV estimation, this negative effect becomes bigger in magnitude. Table 23 column 3 shows that

economic growth drops by 0.24 percent if foreign investments rise by 1 percent. The LIML estimates confirm the adverse effect of FDI, and the coefficient is significant at 10 percent.

Regarding the other control variables, initial GDP has a negative and significant effect on economic growth. For example, the estimated coefficient on initial GDP, - 0.800*** (s.e.= 0.113) in Table 23, column 1, shows that the convergence is conditional in that it predicts higher growth in response to lower starting GDP per person only if the other explanatory variables (some of which are highly correlated with GDP per person) are held constant. The magnitude of the estimated coefficient implies that convergence occurs at a rate of about 8.00 percent per year. The impact of initial GDP per capita is consistent for all the estimators. These results are consistent with past studies that control for initial GDP on the growth-FDI relationship, such as Alfaro et al. (2004) and Borensztein et al. (1998).

Another key determinant of FDI is gross capital formation (domestic capital). This variable has a significant and positive effect on economic growth. This means that more domestic investment promotes economic growth in the GCC economies studied.

Table 23. Total FDI and economic growth estimations

	(1) FE GDP Per Capita growth	(2) RE GDP Per Capita growth	(3) IV GDP Per Capita growth	(4) LIML GDP Per Capita growth
GDP initial	-0.808***	-0.0847	-0.791***	-0.0757
	(0.102)	(0.0600)	(0.120)	(0.0580)
Log (Total FDI)	**-0.135*** **	**-0.0341** **	**-0.245*** **	**-0.0470* **
	(0.0224)	**(0.0159)**	**(0.0839)**	**(0.0247)**
Log (capital formation)	0.112*	0.0832	0.0784	0.0736
	(0.0644)	(0.0586)	(0.0796)	(0.0569)
Log (population growth)	-0.0306	0.0101	-0.0521	0.0160
	(0.0266)	(0.0420)	(0.0348)	(0.0404)
Log (consumption)	0.531***	-0.0635	0.710***	-0.0561
	(0.0951)	(0.0451)	(0.171)	(0.0439)
Constant	-3.084***	0.287		0.266
	(0.646)	(0.253)		(0.239)
R-squared	0.741		0.592	0.188
Hausman test	47.92			
Chi2 (p-value	(0.000)			
Sargan test (p-value)	---	---	0.715(0.69)	---
Cragg-Donald statistic	---	---	11.45	---
Endogeneity test of endogenous regressor (FDI"resource and non-resource")	---	---	3.03(0.081)	---
Observations	54	54	54	54
Number of N	6	6	6	6

Note: (1) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 (2) FDIR indicates FDI in the resource sector and FDINR refers to FDI in the non-resource sector. (3) The endogeneity test is for testing whether the variable of interest is endogenous or not. This test based on the outcomes of the IV(xtivreg2) regression.

4.3.4. Summary and Discussion

The empirical results suggest that resource-FDI inflows hinder economic growth in GCC economies, while non-resource FDI has an insignificant effect on growth. These results are in line with empirical findings reported by Alfaro (2003), Vu and Noy (2009) Aykut and Sayek (2007) and Khaliq and Noy (2007). The results show that FDI in resource-rich economies can be a causal factor in the resource curse via the crowding-out effect of the negative impact of FDI in the resource sector (Asiedu, 2013; Asiedu & Lien, 2011; Poelhekke & van der Ploeg, 2013).

The negative impact of the resource sector is interesting, although possibly not surprising. Sachs and Warner (2001), for instance, have argued that extractive industries may have a negative impact on the economy. FDI in those activities will generate more inputs and therefore will harm the local economy (a variant of the 'resource curse'). The change in local market structures because of the incoming investment flows could raise rent-seeking activity and cause the institutions of the local economy to deteriorate.

For the effect of total FDI inflows, the empirical results show that total greenfield FDI inflows deter economic growth in GCC economies. This result gives evidence of the crowding-out effect of resource-FDI. This study supports previous literature such as Sen (1998), Mencinger (2003) and Smarzynska Javorcik (2004). Sen (1998) argues that foreign firms may have an adverse response to host country R & D, based on a desire to continue to monopolise technological advantage compared to domestic companies. This paper also indicates that multinationals intentionally transfer inappropriate technologies. However, a different justification is also provided here towards explaining this negative relationship.

4.4. FDI and domestic investment: the role of the natural resources sector[7]

The purpose of this section (the third empirical paper) is first to re-examine Feldstein's (1995) hypothesis that outbound FDI reduces domestic investments, utilizing data for six oil abundant countries in the Gulf Cooperation Council (GCC). Then, this paper investigates the possible impacts of sectoral FDI inflows on both public and private domestic investments.

Evaluating the role of the private sector in GCC economies, the private sector has a minimal role, and there are some critical issues, which discourage the contribution of this sector. Sources of financing for the private sector are heavily dependent on the hydrocarbon industry (Hertog, 2013) and the structure of the labour market in this sector.

Most private manufacturing industries produce oil-based products such as petrochemical products, which means that this sector faces a high level of uncertainty related to oil prices. In addition, the issues are connected to political elites. Further, the private sector is not favourable for citizens of Gulf countries, and individuals would rather engage with the public sector because of the high wages and social security offered. According to the Gulf Labour Market Migration and Population Program (2014), foreign employees in the private sector accounted for 88.2 percent of that workforce from 2009-2013. Moreover, in some countries, for example, Kuwait, 93.2 percent of labour is imported from outside, ultimately hampering labour productivity.

This section attempts to answer the two main questions. Firstly, at the aggregate level, it considers whether FDI (inflows and outflows) crowd in or crowd out domestic investments. Secondly, it examines whether the concentration of FDI inflows in the oil

[7] This empirical paper was published as; "Foreign direct investment and domestic investment: Do oil sectors matter? Evidence from oil-exporting Gulf Cooperation Council economies". ***Journal of Business and Economics***, 103, p.p 1-12 (https://doi.org/10.1016/j.jeconbus.2018.11.001).

sector promotes or deters domestic investments. These questions are important for policymakers when they take action regarding diversification policies, and also help them to evaluate the quality of FDI inflows to GCC economies.

Although the flood of FDI inflows/outflows to/from developing countries may raise a significant question regarding their efficiency and impacts on domestic investments, there is a lack of literature analysing FDI inflows to different sectors related to private and public domestic investments in the host country. Government and policymakers need to evaluate how domestic investment is affected by FDI. Understanding these effects may help GCC countries to introduce a proper policy that guarantees diversification.

4.4.1. Model specifications

Agosin and Machado (2005) propose a theoretical framework to investigate crowding-out (CO) or crowding-in (CI) effects of FDI on domestic investments. This study modifies Agosin and Machado's model (2005) to fit the sample of study and the dataset.

It is argued that FDI is an exogenous variable from the viewpoint of the host economy. In this case, FDI depends mainly on global macroeconomic factors and the strategies of multinational corporations (Agosin & Machado, 2005). The theoretical analysis starts from the idea that total investment in one economy is a summation of domestic investment and foreign firms' investment.

Therefore, the investment equation can be written as follows;

$$I_t = I_{f,t} + I_{d,t} \qquad (4\text{-}6)$$

Where I_t is a total investment in time t, $I_{f,t}$ is a foreign investment at time t and $I_{d,t}$ indicates domestic investment at time t.

Domestic investment can be defined as a stock adjustment variable reacting to variances between desired and actual capital stock. Therefore, the domestic investment equation can be shown as;

$$I_{d,t} = \tau(K^*_{d,t} - K_{d,t}) \quad (4\text{-}7)$$

Where $K^*_{d,t}$ refers to the capital stock desired by domestic firms and $\tau > 1$

Following the neo-classical model of investment, desired capital relies on the expected growth rate G^e and the variation between expected output y and actual output Y. Then, the desired capital equation can be presented as;

$$K^*_{d,t} = \gamma_0 + \gamma_1 G_{t+1} + \gamma_2 y_t \quad (4\text{-}8)$$

Substituting equation (4-8) in equation (4-7);

$$I_{d,t} = \tau[(\gamma_0 + \gamma_1 G_{t+1} + \gamma_2 y_t) - K_{d,t}] \quad (4\text{-}9)$$

$$= \tau\gamma_0 + \tau\gamma_1 G_{t+1} + \tau\gamma_2 y_t - \tau\, K_{d,t} \quad (4\text{-}10)$$

$$I_{d,t} = \theta_0 + \theta_1\, G_{t+1} + \theta_2 y_t\ + \theta_3 K_{d,t} \quad (4\text{-}11)$$

where $\theta_0 = \tau\gamma_0, \theta_1 = \tau\gamma_1, \theta_2 = \tau\gamma_2, and\ \theta_3 = -\tau$

the foreign direct investment equation is,

$$I_{f,t} = \emptyset_0\, FDIinflow_t + \emptyset_1 FDIoutflow_t \quad (4\text{-}12)$$

Now, putting domestic investment and foreign investment equations into equation (4-6):

$$\pi_0 + \pi_1 G_{t+t} + \pi_2 y_t + \pi_3 K_{d,t} + \pi_4 FDIinflow_t + \pi_5\, FDIoutflow \quad (4\text{-}13)$$

Crowding out or crowding in effects depend mainly on π_4 and π_5.

If π_4 and $\pi_5 > 0$, this indicates the crowding in effect, whereas if π_4 and $\pi_5 < 0$ it is crowding out effect (Agosin & Machado, 2005).

Our proposed model uses two key equations. The first is for the aggregate level of FDI (inflows and outflows). This model is formulated as follows;

$$DI_{i,t,j} = \beta_0 + \beta_1 FDIinflows_{i,t} + \beta_2 FDIoutflows_{i,t} + \beta_3 savng\ ratio_{i,t} + \beta_3 X_{i,t} + \varepsilon_{i,t} + \vartheta_{i,t} \quad (4\text{-}14)$$

where DI indicates domestic investments in country *i* at time *t*, and *j* represents public or private investments. FDI represents foreign direct investments respectively, saving ratio represents the saving to GDP ratio, and X is a vector of other determinants of domestic investments, while $\varepsilon_{i,t}$ is a time-invariant unobserved heterogeneity term and $\vartheta_{i,t}$ is the random error term. The main purpose of this model is to re-examine the Feldstein hypothesis (1995) for oil-exporting economies (Feldstein, 1995).

The second equation is for the disaggregated level of FDI "resource and non-resource sectors", and is identified as,

$$DI_{i,t,j} = \gamma_0 + \gamma_1 FDIinflows_{i,t,j} + \gamma_2 savng\ ratio_{i,t} + \gamma_3 X_{i,t} + \varepsilon_{i,t} + \vartheta_{i,t} \quad (4\text{-}15)$$

Where FDI is the inflows of greenfield FDI in country *i* to the *j* sector "resource and non-resource sectors" during time t.

4.4.2. Aggregate FDI-DI relationship

The main debate on the FDI-DI association is whether FDI crowds in or crowds out domestic investments. This has been investigated by several studies: Agosin and Machado (2005); Al-sadiq (2013); Borensztein et al. (1998); Desai et al. (2005); Doytch (2016); M. Feldstein and Horioka (1980); and Feldstein (1995). This section re-examines the Feldstein hypothesis (1995) for oil-exporting economies, and estimates Equation (4-14).

Table 24, columns 1 to 4, report the results of the fixed effects model after controlling for heterogeneity and the random effect model. These results are subject to the Hausman test specification to choose an appropriate model for the estimations. The Hausman test statistic strongly rejects the null hypothesis that the random effect is an appropriate model. Therefore, the discussion will be based on the FE estimates. The FE results show that

there is an insignificant positive effect from inbound FDI on public DI, but a discouragement of private DI in the GCC economies. A 1 percent increase in FDI inflows to GCC countries leads to about a 0.00915 percent increase in public investments and a 0.092 percent decrease in private domestic activities. All these results are robust, even after controlling for other macroeconomic variables, and significant at the 5 percent level. The RE estimations show that there is a significant effect of FDI inflows on public domestic investment, but that these significantly and negatively affect private domestic investment in the GCC countries. For outflows of FDI, the RE results confirm the FE estimations; outwards FDI enhances private DI, whereas these outflows hinder public DI.

Table 24. FDI and domestic investments in GCC countries: aggregate level analysis (FE and RE results)

	(1)	(2)	(3)	(4)
VARIABLES	FE (public DI)	RE (Public DI)	FE (private DI)	RE (Private DI)
FDI inflows/GDP	**0.00915**	**0.318*** **	**-0.0920**	**-0.358*** **
	(0.0949)	(0.0586)	(0.112)	(0.0775)
FDI outflows/GDP	**-0.369** **	**-0.431*** **	**0.605*** **	**0.624*** **
	(0.142)	(0.126)	(0.167)	(0.166)
Saving / GDP	0.316***	0.347***	0.0130	0.194***
	(0.104)	(0.0551)	(0.123)	(0.0729)
Inflation rate	-0.131**	-0.189***	0.0160	0.0924
	(0.0530)	(0.0628)	(0.0624)	(0.0830)
Trade openness	0.0353	0.106***	-0.0456	-0.0578
	(0.0460)	(0.0298)	(0.0541)	(0.0394)
Money supply	0.196**	0.122**	0.814***	0.560***
	(0.0960)	(0.0780)	(0.113)	(0.103)
GDP growth	0.144	0.126	0.137	0.155
	(0.123)	(0.130)	(0.145)	(0.172)
Constant	0.0876	2.775	-4.139	21.92***
	(6.701)	(5.580)	(7.888)	(7.378)
Observations	66	66	66	66
R-squared	0.355		0.60	0.82
Number of N	6	6	6	6
Hausman test	22.80		44.34	
	(0.000)		(0.000)	

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.10

FDI can affect domestic investment through spillover effects, but at the same time, the level and quality of domestic investment may attract MNCs through “reverse causality”. In addition, more incentives provided for domestic firms could motivate more FDI, creating a problem of “omitted variables”. Therefore, the previous results may contain bias because of the issue of endogeneity. To eliminate this problem, the model was re-estimated using IV and LIML estimations, which consider the endogeneity issue.

In this study, we believe that FDI inflows, outflows and saving ratio are endogenous variables. This is confirmed by the endogeneity tests provided in table 25. As can be seen from this table the null hypothesis; namely, that the specified endogenous regressors can actually be treated as exogenous is rejected. Following past paper, we instrumented FDI (inflows and outflows) by freedom of investment variable, ease of doing business and trade freedom (Feldstein, 1995). While population growth and retired people (+ 65) instrument saving ratio as a percentage of young people (Feldstein and Horioka, 1980)

Table 25 presents the results of IV and LIML estimates. Table 25 confirms the FE and RE results and shows that more FDI inflows into GCC economies improve public domestic investment but hampers private investments. The coefficients of FDI inflows and outflows in the IV and LIML estimations are larger compared with the coefficients in the FE and RE results. For instance, Table 25 columns 1 and 3 show that a 1 percent increase in FDI inflows in GCC economies leads to approximately a 0.32 to 0.4 percent increase in public investments. It is worth mentioning that the adverse influence of investments abroad is greater than the positive effects of FDI inflows. This might give an indication that there is a crowding-out effect of outwards FDI on public investment.

On the other hand, FDI outflows encourage private investment in the GCC region. It is important to note that the positive impact of FDI outflows on private investment is greater than the negative effect of inward FDI.

Turning to the diagnostic tests, the Sargan test shows that the proposed instruments are valid, because the null hypothesis is rejected at 5 percent. Also, the C-D statistic confirms that the instrumental variables are not weak.

For the other control variables, saving and trade openness show the expected signs. Saving and trade openness promote domestic investment (public and private).

Table 25. FDI and domestic investments in GCC countries: aggregate level analysis (IV and LIML results)

	(1)	(2)	(3)	(4)
VARIABLES	(public DI) LIML	(private DI) LIML	(public DI) IV	(private DI) IV
FDI inflows/GDP	**0.399*** **	**-0.404*** **	**0.318*** **	**-0.358*** **
	(0.0764)	**(0.0864)**	**(0.0586)**	**(0.0775)**
FDI outflows/GDP	**-0.578*** **	**0.661*** **	**-0.431*** **	**0.624*** **
	(0.163)	(0.185)	(0.126)	(0.166)
Saving / GDP	0.415***	0.264***	0.347***	0.194***
	(0.0770)	(0.0867)	(0.0551)	(0.0729)
Inflation rate	-0.175***	-0.0917	-0.189***	-0.0924
	(0.0659)	(0.0736)	(0.0628)	(0.0830)
Trade openness	0.127***	0.0331	0.106***	0.0578
	(0.0321)	(0.0360)	(0.0298)	(0.0394)
Money supply	0.0780	0.583***	0.122	0.560***
	(0.0961)	(0.108)	(0.0780)	(0.103)
GDP growth	0.0318	-0.0548	0.126	-0.155
	(0.167)	(0.187)	(0.130)	(0.172)
Constant	-4.835	27.29***	2.775	21.92***
	(7.039)	(7.939)	(5.580)	(7.378)
Observations	66	66	66	66
R-squared	0.872	0.858	0.355	0.816
Number of N	6	6	6	6
Sargan test (p-value)			5.89(0.09)	
Cragg-Donald statistic			16.67	16.67
Endogeneity test of endogenous regressor (FDI" outflows and inflows" and saving)			3.55(0.031)	2.55(0.04)

Note: (1) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 (2) FDIR indicates FDI in the resource sector and FDINR refers to FDI in the non-resource sector. (3) The endogeneity test is for testing whether the variable of interest is endogenous or not. This test is based on the outcomes of the IV (xtivreg2) regression.

4.4.3. Disaggregate FDI-DI relationship

To examine which kind of FDI promotes or deters public and private domestic investment, in this section, FDI inflows are split into two main sectors; the oil and nonoil sectors. This classification is based on the nature of the sample of the study: GCC economies.

Given the importance of the oil boom as a key determinant of foreign investors' decisions in GGC countries, it is worthwhile to investigate how the effects of FDI inflows vary between resource and non-resource sectors. For this purpose, this study splits FDI into two types; FDI in the oil and non-oil industries. This kind of analysis shows whether FDI is leading or following the distribution of host country production. If the sectoral distribution of FDI is noticeably different from the distribution of the existing capital stock or of production, the contribution of FDI to capital formation is likely to be more positive than when the distribution of FDI follows the existing sectoral distribution of capital stock (Agosin & Machado, 2005).

Table 26 reports the results of oil and non-oil FDI impacts on domestic investments using FE and RE models. All the results confirm that FDI into extractive industries has a significant crowding-in effect on public domestic investments, but that these investments have an insignificant effect on private domestic investments.

The Hausman test confirms that FE results are appropriate for the model. The FE results show that FDI in the oil sector has significance and positive impacts on public investments. Private investment, however, is affected negatively by these kinds of investments. Private domestic investment decreased by 0.4 percent when FDI in the extractive sector increased by 1 percent, while public investment rose by 0.6 percent if those investments increased by 1 percent.

Table 26. Domestic investments- FDI relationship: Sector-level analysis (FE and RE estimations)

VARIABLES	(1) FE (Public DI)	(2) RE (Private DI)	(3) FE (Private DI)	(4) RE (Private DI)
Oil FDI/GDP	**0.600*** **	**0.590*** **	**-0.411** **	**-0.0676**
	(0.140)	**(0.165)**	**(0.204)**	**(0.229)**
Non-oil FDI/GDP	**-0.0106**	**0.0771**	**-0.0526**	**-0.0908**
	(0.0406)	**(0.0573)**	**(0.0591)**	**(0.0797)**
Saving /GDP	0.151	0.212***	0.0806	-0.0469
	(0.0960)	(0.0548)	(0.140)	(0.0762)
Inflation rate	-0.0828	-0.242***	0.0298	-0.0129
	(0.0503)	(0.0665)	(0.0732)	(0.0925)
Trade openness	2.93e-05	0.0551*	-0.0286	0.0880*
	(0.0426)	(0.0329)	(0.0620)	(0.0458)
Money supply	0.168**	0.225***	1.073***	0.746***
	(0.0831)	(0.0607)	(0.121)	(0.0844)
GDP growth	0.256**	0.249*	-0.0872	-0.401**
	(0.104)	(0.137)	(0.151)	(0.191)
Constant	5.630	19.89***	-13.04	2.473
	(6.027)	(4.620)	(8.768)	(6.426)
Observations	66	66	66	66
R-squared	0.439		0.756	
Number of N	6	6	6	6
Hausman test	34.52(0.000)		32.31(0.000)	

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

After considering the issue of endogeneity, the results still hold. Table 27 presents the results of the IV and LIML estimations. Again, these empirical results confirm the FE and RE estimations. The most significant result is the impact of oil-related FDI on public and private investment. The IV and LIML show that there is a positive and significant effect of oil FDI on public investment. This impact is larger in the LIML estimations.

Table 27. Domestic investments- FDI relationship: Sector-level analysis (IV and LIML estimations)

VARIABLES	(1) IV (Public DI)	(2) IV (Private DI)	(3) LIML (Public DI)	(4) LIML (Private DI)
Oil FDI/GDP	**0.590*** **	**-0.0676**	**1.309***	**-1.077***
	(0.165)	**(0.229)**	**(0.668)**	**(0.644)**
Non-Oil FDI/GDP	**0.0771**	**-0.0908**	**0.449****	**-0.246**
	(0.0573)	(0.0797)	(0.218)	(0.216)
Saving /GDP	0.212***	-0.0469	0.177*	-0.0500
	(0.0548)	(0.0762)	(0.0966)	(0.103)
Inflation rate	-0.242***	-0.0129	-0.223**	-0.0116
	(0.0665)	(0.0925)	(0.0981)	(0.105)
Trade openness	0.0551*	0.0880*	0.000884	0.148**
	(0.0329)	(0.0458)	(0.0676)	(0.0688)
Money supply	0.225***	0.746***	-0.213**	0.781***
	(0.0607)	(0.0844)	(0.0973)	(0.104)
GDP growth	0.249*	-0.401**	-0.00874	-0.159
	(0.137)	(0.191)	(0.294)	(0.301)
Constant	19.89***	2.473	24.46***	-3.139
	(4.620)	(6.426)	(8.601)	(8.954)
Observations	66	66	66	66
R-squared	0.439	0.756	0.60	0.67
Number of N	6	6	6	6
Sargan test (p-value)	2.89(0.23)	2.390.302)		
Cragg-Donald statistic	11.23	11.23		
Endogeneity test of endogenous regressor (FDI" resource and non-resource" and saving)	2.80(0.042)	2.417(0.049)		

Note: (1) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 (2) FDIR indicates FDI in the resource sector and FDINR refers to FDI in the non-resource sector. (3) endogeneity test is for testing whether the variable of interest is endogenous or not. This test based on the outcomes of the IV(xtivreg2) regression.

4.4.4. The impact of oil price shocks on domestic and foreign investments

To test the impacts of positive oil prices on the used variables, this study performs a vector auto-regressive model (VAR) model. Before conducting any empirical investigations using the VAR model, it is very important to check for time series properties, in order to avoid the issue of spurious regression and make the results more robust. Therefore, this study firstly applies a unit root test for panel data. The traditional Augmented Dicky-Fuller (ADF) test arguably suffers from issues related to its power in rejecting the null stationary series for short-spanned data. Recent studies suggested that panel unit root tests are more powerful than unit root tests based on individual time series (Al-Iriani, 2006). Hadri (2000) proposes a unit root test for panel data. It is argued that this test is suitable for a small sample panel (small N). Since the sample is relatively small regarding the countries, Hadri's unit root test is performed for the panel.

Table 28 shows the results of Hadri's unit root test. All variables have a unit root at the level. However, these series were converted into stationary after taking the first difference, as the null hypothesis is rejected at the 1 percent level of significance. Thus, these variables are all integrated from the first order I(1).

The next step is to identify whether there is a long-term relationship among the selected variables. This study performs Pedroni's (2004) co-integration test. Pedroni (2004) developed a technique, which enables the use of a small sample of panels (N, number of cross-countries). In addition, this test allows for heterogeneity in the intercepts and slopes of the co-integrating equation. Careful consideration is given to the results of the co-integration test shown in Table 29. The table shows that the null hypothesis of no co-integration is rejected at the 1 percent significance level. This confirms that all dependent variables and independent variables share a long-run relationship in the GCC countries.

This relationship must be investigated by testing the size of impact and direction using panel data estimations.

Table 28. Panel unit root test- Hadri test

Variables	Hadri test	
	Level	1st difference
FDI outflows ratio	11.04***	-0.98
FDI inflows ratio	9.79***	0.62
FDI oil sector ratio	2.53***	0.53
FDI non-oil sector ratio	4.89***	-1.86
Public domestic investments ratio	3.63**	-0.263
Private domestic investments ratio	7.82***	-1.86
GDP growth	2.13***	-0.8009
Saving ratio	1.71***	-0.142
Inflation rate	2.07***	-0.511
Trade	10.214***	-0.265
Money supply	5.72***	-1.410

Note: the null hypothesis is that all panels are stationary, and the alternative hypothesis is some panels contain a unit root *** p<0.01, ** p<0.05, * p<0.1

Table 29. Panel Co-integration test- Pedroni test

Equation(s)	Panel roh	Panel PP	Panel ADF
Public Investment= f (FDI outflows, FDI inflows, saving ratio, inflation, trade, money supply, GDP growth)	4.75***	-7.73***	-2.83***
Private Investment= f (FDI outflows, FDI inflows, saving, inflation, trade, money supply, GDP growth)	4.67***	-5.02***	-2.84***
Public Investment= f (FDI oil sector, FDI non-oil sector, saving ratio, inflation, trade, money supply, GDP growth)	4.460***	0.679	0.2017
Private Investment= f (FDI oil sector, FDI non-oil sector, saving ratio, inflation, trade, money supply, GDP growth)	4.44***	-1.44*	-2.66***

Note: the null hypothesis of this test is that there is no co-integration, while the alternative is that all panels are co-integrated. *** p<0.01, ** p<0.05, * p<0.1

Since all the variables are stationary at first difference I (1) and these variables are co-integrated, it is possible to conduct a VAR model (Sahoo, Sahu, Sahoo, & Pradhan, 2014). In a VAR model, the coefficient cannot be explained directly. Thus, innovation-accounting techniques have been adopted which consist of impulse response functions (IRFs). The IRFs inspect the relative effects of each variable on other variables, and display the response of each variable in a linear system to a shock from system variables. The main part of the VAR model is the optimal lag selection. The lag-length selection in

the current VAR estimation has been based on the Akaike information criterion (AIC), Schwarz information criterion (SIC) and Hannan-Quinn information criterion (HQC). The details on the lag selection are provided in Table 30. The criteria agree that five years' lag is appropriate.

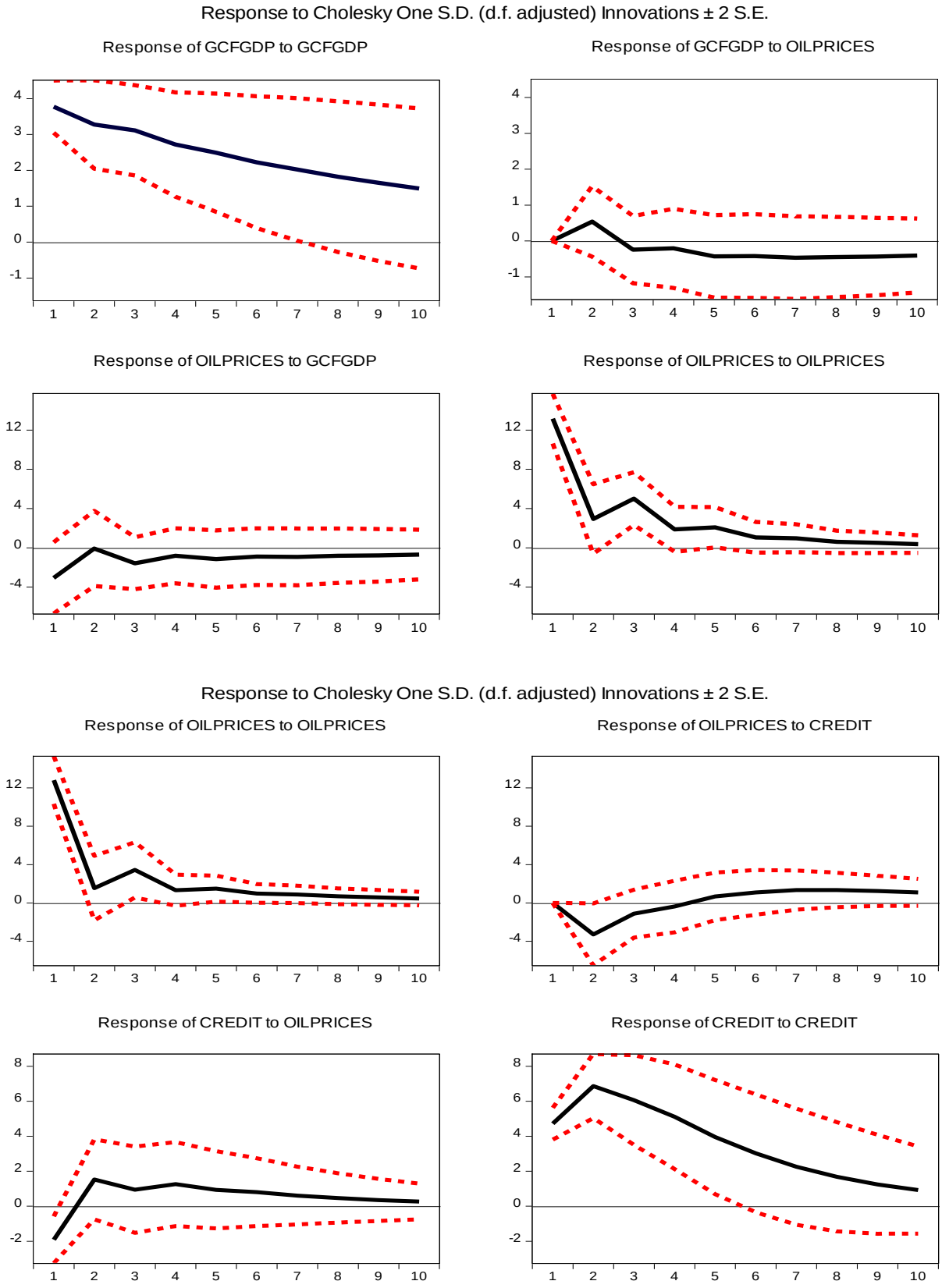
Figure 14 presents the results of the IRFs of oil price on domestic investments (public-private). Oil prices have initial positive effects on public domestic investments, but these effects become negative after the second year. An increase in oil prices by one standard deviation leads to an increase in public investments for the next two years. For private domestic investments, private investment is found to respond negatively to a shock in oil prices for the first two years, but these responses become positive after the third year. The latter result is in line with Hanousek et al. (2017). Private investment could benefit from positive shocks in oil price in the future for GCC economies.

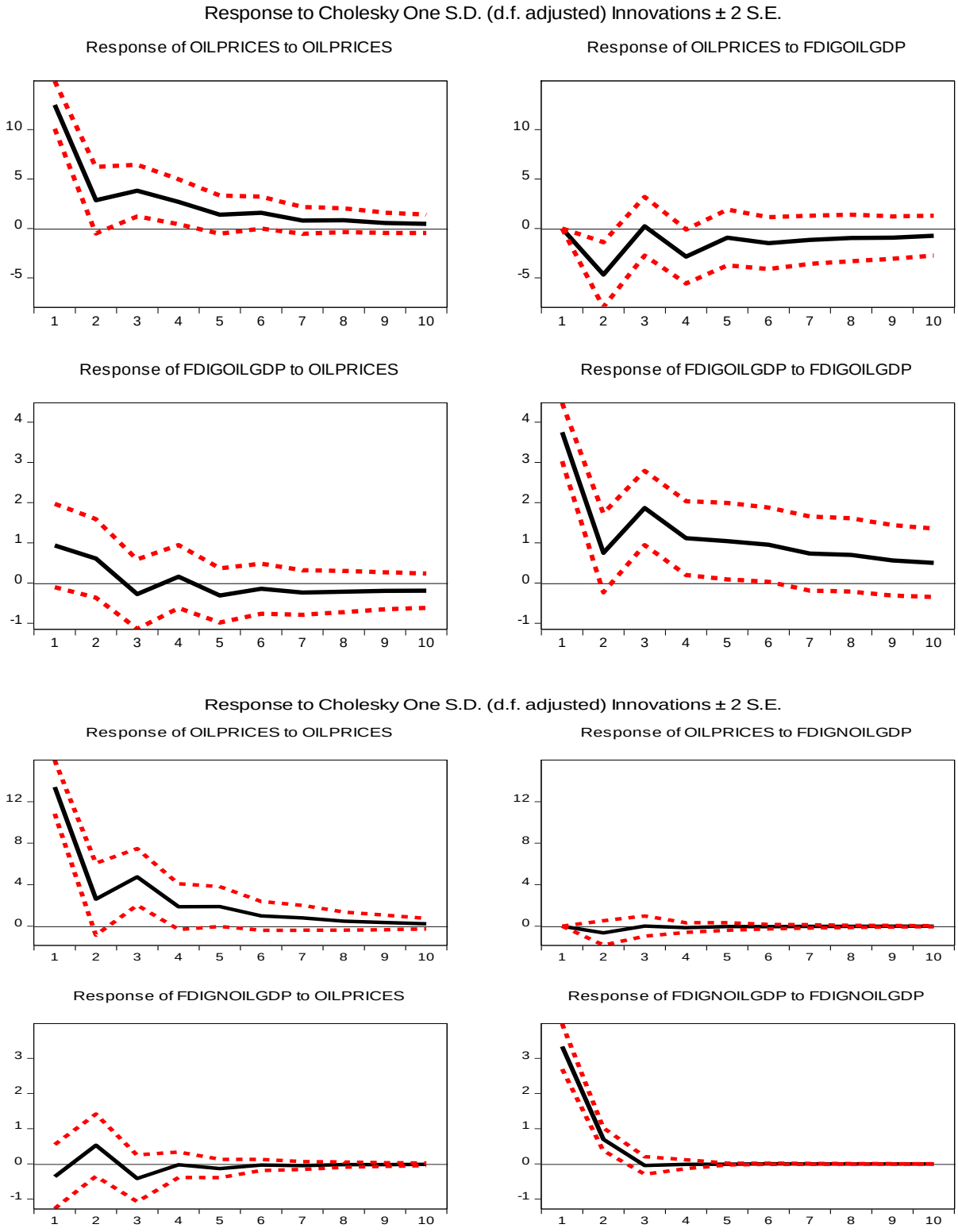
Another interesting result is related to the responses of oil-based and non-oil related FDI inflows to oil prices. Figure 14 shows that FDI inflows to the oil sector respond positively to one standard deviation increase in oil prices. However, this effect becomes negative after two years and null after six years.

Table 30. VAR lag selection criteria

Lag	AIC	SC	HQ
0	33.10422	33.32416	33.18098
1	30.29570	31.61530	30.75628
2	29.21286	31.63213	30.05725
3	28.65566	32.17459	29.88386
4	28.03876	32.65735	29.65077
5	-28.81635*	-23.09808*	-26.82052*

Figure 14. The impulse response function of domestic investment to oil prices shocks





4.4.5. Summary and Discussion

The negative association between FDI inflows and private domestic investments can be explained by the competition effect. MNCs are larger than domestic firms, and these foreign firms use highly advanced technology, which is not available to domestic firms

(Aitken & Harrison, 1999; Haddad & Harrison, 1993). On the other hand, public investments in GCC countries depend mainly on the oil sector to finance their activities; therefore, these investments benefit more from foreign firms' activities through their profits and technologies. For that reason, the study later investigates the impacts of oil-oriented FDI on domestic investments. Also, it can be suggested that FDI was slow to engage with private investment because of the uncertain political and economic environment.

This empirical chapter found that outflow FDI crowds in private domestic investments in GCC countries One possible explanation for this positive impact is that outward FDI permits corporations to import cheaper factors from foreign affiliates and to make exports of intermediate goods used by foreign affiliates. This means that those firms make a combination of home production and foreign production to reduce costs and raise the returns to domestic production (Desai et al., 2005; Herzer, 2008).

Furthermore, the results suggest that oil-related foreign investment inflow is significantly and positively correlated with public domestic investment in the GCC area. The reason for this behaviour of FDI in the extractive industry is that the GCC is petroleum-dependent. These countries invest massively in infrastructure and depend predominantly on only one source of revenue, which is oil. With that in mind, GCC economies attracted almost 50 percent of FDI inflow to the Middle East and North Africa (MENA) region over the 2000s, and those investments were concentrated mainly in extractive industries. Therefore, it was expected that oil-FDI would have a positive impact on the public sector. These results show that FDI in these economies follows the structure of production.

Private domestic investment is a relatively weak sector in the GCC because of high political and economic uncertainty, and less conducive regulatory and institutional

environments. Because of this, foreign firms do not participate to a great extent in private economic activities.

Chapter 5. Conclusions and Policy Implications

Since the early wave of liberalization in developing economies, more attention has come to be paid to the role of FDI on stimulating sound economic development in the host country. This has attracted a large body of research to understand the determinants and evaluate the impacts of FDI inflows in host developing economies. For oil-rich countries such as those of the GCC, this thesis contributes to this effort. The main aim of this thesis was to investigate the natural resource curse hypothesis in GCC economies through an FDI channel: *"the FDI-natural resource curse"*. For this purpose, this study attempts to assess the aggregate and disaggregate determinants of FDI inflows in a resource-rich economy: the GCC area. And focuses mainly on the role of natural resources (the subject of first empirical work), the impact of FDI inflows in resource and non-resource sectors on economic growth (the aim of second empirical paper), and the effect of total and sectoral FDI on domestic investment in the GCC region (the subject of the third empirical study).

First, the overall results support the hypothesis that natural resource abundance hampers greater aggregate FDI inflows to the host country (the first empirical paper). The findings of sector-level analysis indicate that natural resources attract more FDI in the resource sector but deter FDI in the non-resource sector. These results are consistent across several estimators. Another key and the interesting result is the impact of corruption on sectoral FDI inflows. Oil multinational corporations (MNCs) are attracted to more corrupted countries, suggesting that low institutional quality and corruption may attract FDI in the resource sector. Corrupt elected politicians and oil multinational corporations join to cream off natural oil revenues if there is an absence of transparency. This allows foreign firms, and in particular oil firms, to extract and access natural resources and make high

profits. The other side of the story is that GCC countries impose very low tax rates (almost no tax) on foreign firms.

The second conclusion that emerges from the results is that resource-FDI inflows hinder economic growth in the GCC economies, while non-resource FDI has an insignificant effect on growth. Moreover, the total greenfield FDI inflows deter economic growth in GCC economies. These results give evidence on the crowding-out effect of resource-FDI. This is because foreign firms may have an adverse response to host country R&D in order to continue to monopolise a technological advantage compared to domestic companies. Also, these firms may intentionally transfer inappropriate technologies.

The final key finding of this thesis is that FDI inflows promote domestic public investment but hinder private domestic investment in GCC economies. Meanwhile, outward FDI enhances private domestic investment. The micro-level analysis (sectors) indicates that oil-related foreign investment inflow is significantly and positively correlated with public domestic investment in the GCC area.

Taken together, these findings provide significant support for the natural resource curse from different areas. From the FDI determinant side, this thesis gives evidence on the FDI-natural resource curse, supporting the results of Poelhekke and Van der Ploeg (2010), Poelhekke and van der Ploeg (2013) Asiedu (2013) and Asiedu and Lien (2011). Based on the FDI impacts dimension, this study supports the negative effect of FDI on economic growth, which is in line with Alfaro (2003), Vu et al. (2008) and Vu and Noy (2009).

The results of this thesis have important implications related to the resource-rich economies in general and the GCC area in particular. Countries such as those of the GCC should adopt an effective FDI policy that guarantees more benefits from FDI. They

should seek to increase the degree of FDI diversification and reduce the degree of oil dependence. Also, they need to improve the quality of institutions, which may improve the efficiency of FDI. Attracting FDI is not the main issue, but the benefits from foreign firms are important. The GCC economies provide incentives for foreign investors, but this approach does not guarantee spill-overs from FDI. This process accrues only under specific conditions, such as a certain level of income, more openness, a certain level of education and a well-developed financial sector. Formulation of FDI policies should go hand-in-hand with policies that promote financial development (Alfaro et al., 2004). In addition, improving domestic conditions that establish equitable linkages, improving domestic firms and benefitting from technological know-how is important. Further, these countries should adopt screening policies to guarantee that FDI does not displace domestic firms. Also, MNCs should transfer advanced technologies or introduce new products to the country's export basket. This process requires administrative skills to implement effective screening policies. Alternatively, these countries might adopt a fairly liberal system and then pursue specific companies that fit in well with the process of progressing up the quality ladder.

Finally, although this thesis has shed important new light on the determinants of foreign direct investment and its impacts on economic growth and domestic investment, further analytical work is needed in order to develop a deeper understanding of FDI in resource-rich economies. The findings of this paper suggest some directions for further research. First, this study was constrained by a specific sample, and it would be better to expand this sample. Using different proxies for natural resources could give different results. Also, if data on the firm level is available for the host economies, this would appear to be

the best way forward for providing an improved understanding of the issues and dimensions of sectoral FDI inflows.

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