OIL AND THE LOCATION DETERMINANTS OF FOREIGN DIRECT INVESTMENT INFLOWS TO MENA COUNTRIES

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ABSTRACT

The study was concerned with the analysis of oil and main location determinants of foreign direct investment (FDI) in MENA countries, along Dunning's (1981) Ownership-Location-Internalization (OLI) paradigm. Moreover, the study examined whether or not oil as a proxy for natural resources in the host countries alters the relationship between natural resources and institutional quality. The study used fixed and random effects along with GMM-system estimation technique in a dynamic panel data for the period 1960-2012 for 17 countries. The key location determinants of FDI inflows in the MENA region are natural resources in fuel exports form, oil production relative to oil reserves, market size, trade, inflation, and institutional quality. Whereas, natural resources in approach of oil rents, oil production, and oil reserves discouraged FDI to the MENA economies. The effect of investment profile as a proxy for institutional quality on FDI depends on the importance of natural resources in host countries. The results showed that fuel exports, oil production relative to oil reserves, trade openness, market size, inflation, institutional quality, the interaction between institutional quality and natural resources, played a crucial role in spurring inward FDI to MENA countries. In contrast, oil rents, oil production, and oil reserves discouraged FDI inflows to MENA countries. Light was shed on some interactions between oil as a proxy for natural resources and investment profile as a measure for institutional quality. It was found that the interaction term between natural resources and investment profiles had a negative effect on inward FDI into MENA countries. These results suggested that natural resources undermined the positive effects of investment profiles on FDI flows. Regarding the impact of the main variables, the results showed that natural resources, namely fuel exports, and oil production relative to oil reserves, encourage FDI inflows into the MENA region. In addition, the effects of explanatory variables on FDI inflows found that trade openness, GDP constant as a proxy for market size, high inflation, and investment profile as a measure of institutional quality, are the main determinants of FDI inflows into the MENA economies. Inflation also had a positive impact on FDI inflows into the MENA region. In addition, empirical evidence showed that the estimated coefficients of human capital and infrastructure do not have any influence on FDI inflows. The interaction term between oil reserves and investment profile was negative and insignificant in all models. However, the interaction term between oil production relative to oil reserves and investment profile was negative and significant at 5% in both models.

INTRODUCTION

Foreign Direct Investment (FDI) plays an important role in the expansion of the economies within developing countries. There has been an increase in world FDI flows in 2011, up by 16% as compared with 2010. It was caused by the high profits of a number of

Transnational Corporations (TNCs) and high economic growth in developing countries. This accounted for 45% of world FDI in 2011, which was about $684 billion.

The nationalization of the petroleum industry occurred for the first time in 1917 in the Russian Revolution; later on, nationalization occurred in Bolivia, Mexico, Venezuela and Iran; and during the 1960s, nationalization of oil and gas took place in five countries: Argentina, Burma (Myanmar), Egypt, Indonesia, and Peru. About a decade later, in the 1970s, nationalization had finally reached Algeria, Iraq, Kuwait, Libya and Nigeria, along with a slight rise in the Saudi holding of the company Aramco. There is vast empirical literature on the determinants of FDI inflows into developing countries (Ezeoha & Cattaneo, 2012; Onyeiwu & Shrestha, 2004; Asiedu, 2002, 2006; Solomon & Ruiz, 2012; Busse & Hefeker, 2007; Naude & Krugell, 2007; Sekkat & Varoudakis, 2007; Khadaroo & Seetanah, 2009). However, only a few studies focus on the determinants of FDI inflows in the MENA region (e.g. Hisarcikilar et al., 2006; Mohamed & Sidiropoulos, 2010; Moosa, 2009).

The factors may include the oil extraction (oil production), oil exploration (oil reserves), and a combination of oil extraction and oil exploration: oil relative production. These factors have not been presented in the literature on MENA region in the past. Furthermore, FDI in natural resource-rich countries tends to be concentrated in the natural resource sector. However, natural resource exploration requires a large initial capital outlay and the continuing operations demand a small cash flow. Consequently, FDI may be staggered after the initial phase (Asiedu & Lien, 2011).

The main contributions of this study were threefold. It is the first study of FDI inflows to the MENA countries linking together the effects of oil processing in three approaches, in the same way as Mina (2007a) tested in the model on GCC countries. Secondly, it is the first study to analyze the interaction between investment profiles as a proxy for institutional quality; it employs natural resources as explanatory variables by adding the interaction term between both in the FDI inflow regression. The aim is to determine how the total effect of investment profiles on FDI inflows is affected by natural resources. In fact, there is only one study of the joint role of the interaction between democracy and natural resources (Asiedu & Lien, 2011). Finally, given the importance of FDI in the MENA region, the following questions have been addressed:

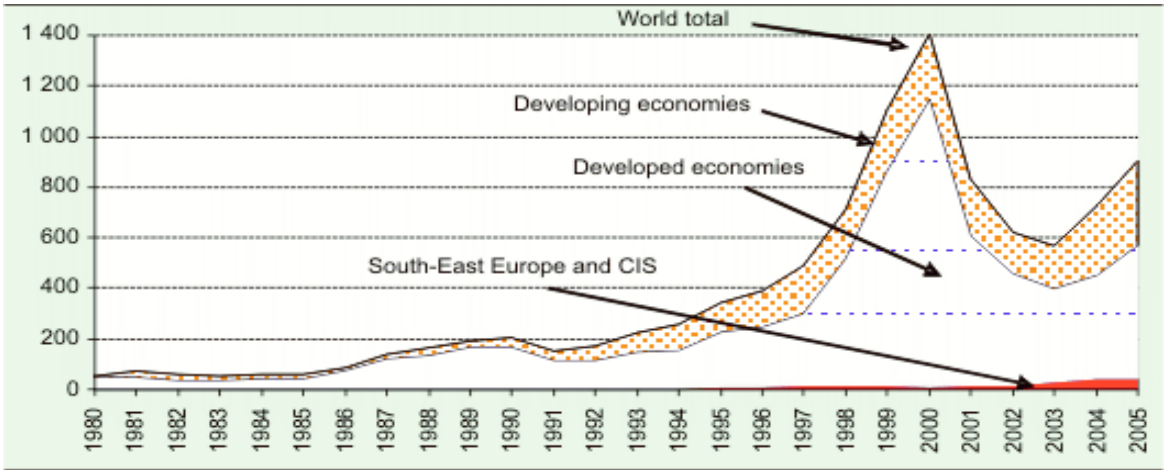
1. *How important are natural resources in directing foreign direct investment (FDI) flows to the MENA region?*
2. *Where are the location determinants for foreign direct investment (FDI) into the MENA countries?*
3. *Do natural resources alter the relationship between institutional quality and foreign direct investment (FDI)? Or do natural resources mitigate the positive effect of institutional quality on FDI?*

The study aimed to contribute to the existing literature by attempting to prove the Location dimension of Dunning's (1981) Ownership-Location-Internalization (OLI) paradigm on the determinants of FDI in MENA countries. The study empirically examined the influence of oil, openness to trade, market size, inflation rate, infrastructure development, human capital, and institutional quality in host countries on FDI flows. Panel data was used to analyze the research questions for the 17 MENA countries between 1960 and 2012.

Recent Trends in FDI

In absolute terms, global FDI flows grew over a year, rising by 29% to $916 billion in 2005, compared to 27% in 2004 (UNCTAD, 2006). Figure 1 shows FDI flows throughout the

world, indicating that FDI stock increased by 3%, recorded at $20.4 trillion. Inward FDI to developing countries rose by 29% from 2005, especially, in MENA countries.



Source: UNCTAD, based on its FDI/TNC database (www.unctad.org/fdi statistics)

Figure 1
FDI INFLOWS: GLOBAL AND BY GROUPS OF ECONOMIES, 1980-2005

The World Investment Report (WIR) outlined that construction was the most significant area for investment in the last oil boom, along with their activities in investment behavior in infrastructure, housing, tourism, petrochemicals, and real estate.

The top FDI inflows were received by the following oil-producing countries: Algeria, 55%; Egypt, 37%; Nigeria, 80% and Sudan, 90%. Looking only at North Africa, the level more than doubled by 42% to $13 billion of total FDI inflows to Africa (UNCTAD, 2006). It went to natural resources in oil and services. During the same period, Egypt, Morocco, Sudan, Algeria and Tunisia attracted most of the FDI inflows to North Africa in 2005. The rise in FDI inflows to $5.4 billion in Egypt resulted from a strong increase in investment in the petroleum industry with privatization programmers (UNCTAD, 2006). The main FDI inflow recipient sectors in Morocco and Tunisia are privatization programs. Further, Egypt reformed its tax system to reduce corporate income tax.

In 2008, there was an increase in FDI inflows into developing countries to record levels for their shares in global FDI inflows that increased to 37% and 7%, respectively (from 27% and 5%, respectively in 2007). The combined share of 44% was close to the record share achieved in 1982 and 2004, demonstrating the increased significance of these economies as hosts for FDI during the crisis of 2008. From the World Investment Report (UNCTAD, 2007), inward FDI flows to Africa declined for the third consecutive year to $42.7 billion because of the decrease in FDI to North Africa in 2011, which halved to $7.69 billion. In particular, FDI inflows resumed in Egypt and Libya.

According to UNCTAD, based on its FDI/TNC database, during the period 2001-2005, inward intraregional FDI increased. This was a consequence of the rise in FDI from GCC countries because of increasing oil prices by $8 billion. The oil-rich Gulf States attracted the highest FDI inflows. These were particularly concentrated in Lebanon, Saudi Arabia, Syria and the United Arab Emirates, and accounted for over 90% of the value of approved investments. Similarly, in 2011, inward FDI dipped by 16% to $49 billion in West Asia as a result of the deterioration of global economic prospects and continuing political instability. Overall, inward

FDI declined in GCC countries, registering 53 percent in 2011 in comparison to 2010 when it was 69 percent. Saudi Arabia recorded $16 billion in 2011, Oman and Qatar recorded negative values, and the United Arab Emirates, Bahrain and Kuwait returned to a high level of 16%.

THE DETERMINANTS OF FDI INFLOWS: EMPIRICAL EVIDENCE

FDI in natural resources, particularly in oil and mining, increased the importance for primary sectors, and accounted for the bulk of the primary sector. However, when comparing the distribution of FDI inflows across MENA countries, the African regions attracted a large proportion of FDI inflows in 2005 toward natural resources, especially oil and petroleum. On the other hand, many FDI inflows were low in developing economies that lacked natural resources.

The Location Dimension of the Ownership Location Internalization (OLI) Paradigm Inflation, Infrastructure and Human Capital

Location dimensions have historically been used as major factors of FDI; such as inflation rate, infrastructures and human capital.

The Inflation Rate Effect

The impact of inflation rate on FDI inflows is ambiguous; there are many reasons to expect that inflation would have a negative effect on FDI. For instance, since volatile inflation is a clear sign of macroeconomic instability, a high inflation rate can be a hindrance to FDI (Botric & Skuflic, 2006). Another argument for using inflation as a proxy for economic stability is that, uncontrolled inflation can often be an indication of loss of fiscal or monetary control (Dhakal et al., 2007; Nonnemberg & Mendonça, 2004). It leads to foreign investors investing in other countries that have more stable economies. Moreover, Dhakal et al. (2007) indicate that a declining current account balance leads to devaluation of the host country's account; it also leads to more variations on inflation rates and less FDI inflows.

Mohamed & Sidiropoulos (2010) examined the effects of change in the Inflation Rate (CPI) on FDI inflows in developing countries. The samples from twelve MENA countries and 24 developing countries were selected to examine the change in the inflation rate on FDI inflows. Inflation rates were, as expected, negative and significant in all estimations. Asiedu (2006) used fixed-effects panel data for 22 Sub-Saharan African countries to estimate the determinants of FDI over the period 1984-2000. The study found that a low inflation rate encouraged FDI flows to Africa. Asiedu & Lien (2011) estimated dynamic panel data from 112 developing countries between 1982 and 2007 and found that inflation as a measure of macroeconomic uncertainty was seen to be negative.

The Infrastructure Effect

As discussed above, infrastructure is a key determinant of FDI inflows and has implications for the location dimension of the Ownership-Location-Internalization (OLI) paradigm. From a theoretical perspective, some studies found a significant positive relation between infrastructure and FDI (e.g. Asiedu, 2006; Asiedu & Lien, 2011). However, other studies did not find any statistical significance that infrastructure attracts FDI (e.g. Mohamed & Sidiropoulos, 2010; Cleeve, 2008), whilst others found a significant negative relationship (e.g. Naude & Krugell, 2007; Groh & Wich, 2012). There are several examples of theoretical and

empirical literature which focused on infrastructure as the one key determinant in FDI. Sekkat & Varoudakis (2007) used panel data estimators of 72 developing countries; it has been declared that infrastructure (proxy by mobile phone usage) plays the main role in determining FDI in an economy. Mina (2007a) analyzed the location determinant of FDI in the six GCC countries over the period 1980-2002. A model based on Dunning (1981) was built, which concluded that a natural logarithm form of the sum of telephone mainlines and cellular mobile phones per 1000 people can be used as a proxy for infrastructure as a positive influence on FDI inflows.

Ali et al. (2010) extended the analysis by examining the determinants of FDI in 69 countries (Asia, East Europe, Latin America and the Caribbean, Middle East and North Africa, and Sub-Saharan Africa), using panel data over the period 1981-2005. Infrastructure (telephone mainlines per 1000 people) has a positive impact on FDI, but is statistically insignificant. Another study by Cheng & Kwan (2000) expressed the determinants of FDI in 29 Chinese regions (1985-1995) using GMM estimators. It concluded that infrastructure (all roads, high-grade paved roads, and railway) is positive and significant.

The Human Capital Effect

There are other factors that impact FDI. Education is one of the most important aspects in human capital development, if the quality of education can be improved as well as a country's location advantages. In skilled labor force sectors, the level of education improves production facilities and techniques. Significant positive effects have been found (Asiedu, 2006; Asiedu & Lien, 2011; Goswami & Haider, 2014), as well as significant negative impacts (Mina, 2007a,b, 2009) — and some studies find inconclusive effects (Cleeve, 2008; Schneider & Frey, 1985).

A review of the literature regarding human capital is found to be a relevant determinant in support of this concept. For instance, studies found that human capital (the general secondary education enrollment rate) had a positive and significant effect on FDI inflows to Africa (Asiedu, 2002, 2006; Khadaroo & Seetanah, 2009). Similarly, Moosa (2009) also found that human capital (students in tertiary education as a percentage of total population) was attractive to FDI to MENA countries. Sekkat & Varoudakis (2007) outlined that human capital was a correct sign, but was not always significant in developing countries.

In other related studies, Sekkat & Varoudakis (2007) used panel data estimators of 72 developing countries and declared that education (secondary school enrollment ratio) plays the main role in determining FDI in an economy. In another recent study, Noorbakhsh et al. (2001) examined the importance of human capital as a determinant of FDI in developing countries, using panel data for 36 developing countries from Africa, Asia, and Latin America, and Ordinary Least Squares (OLS) estimators for a three-year average (1980-1994). Three alternative variables for human capital were used (school enrollment ratio; number of accumulated years of secondary school; and, tertiary education in the working age population). It was observed that human capital is clearly positive, and has a significant impact on FDI.

Institutional Dimension - Investment Profile

Concerning the influence of institutional approach as one of the factors that affect FDI inflows to MENA regions, the literature on economic development has been concentrated on institutional quality as an important determinant of FDI (Benassy-Quere et al., 2007). In the present study, no significant relationship between FDI inflows and the other components of risk tested was found. For instance, certain factors may include government stability, socioeconomic

conditions, internal conflict, external conflict, corruption, military involvement in politics, religion in politics, law and order and ethnic tensions. The investment profile was used as a measure for institutional quality. According to the Indigenous Construction Research Group (ICRG), the risk rating assigned is the sum of three subcomponents, which are: contract viability/expropriation; profits repatriation; and, payment delays. Each has a maximum score of 4 points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points, to Very High Risk.

The Investment Profile Effect

Theoretical and empirical literature on the effect of investment profile as a proxy for political risk on FDI inflows were examined. Mina (2009, 2012), Mohamed & Sidiropoulos (2010), and Busse & Hefeker (2007) found that the investment profiles have a positive impact on FDI flows. Boubakri et al. (2013) investigated the relationship between globalization (measured by FDI) and foreign portfolio investment. Evidence has been provided that investment profile as a measure of the institutional level has a positive effect on FDI as expected. On the other hand, the coefficient for the overall political risk index is negative as expected, and is significant. Political risk creates an additional cost to investors; therefore, one would expect a negative relationship between political risk and FDI (Solomon & Ruiz, 2012). A study by Abdel-Rahman (2007) suggested that investment profile had a negative effect on FDI inflows.

New Theory of Trade Market Size, Trade Openness and Natural Resources Endowment

A new theory of trade has been used to analyze major factors of FDI, such as market size, trade openness and natural resources. The new trade theory has provided the essential tools to discuss the trade pattern and the firm's behavior towards investment.

The Market Size Effect

A great part of the empirical literature is focused on the relationship between market size and FDI and these were found inconsistent with the GDP hypothesis. For example, Mina (2007a) found that GDP as a proxy for market size is a negative and significant influence on FDI flows to GCC countries. Market size discouraged FDI inflows to GCC countries. Moosa (2009) used EBA (extreme bounds analysis) on cross-sectional data from 18 MENA countries and found that GDP is negative and insignificant in this sample. Botric & Skuflic (2006) found that GDP (the number of inhabitants) is negative and has a significant effect on FDI stock. Dhakal et al. (2007) reported that real GDP is positive and has insignificant impact on FDI. An empirical study, known as the Gravity Model of Trade (which was first used by Tinbergen in 1962 to predict bilateral trade flows based on the economic sizes of countries), often uses GDP measurements and the distance between two units. Using this model thus enables successful prediction of the flow of trade between countries. However, parallel studies of FDI inflows are well behind the trade literature (Blonigen, 2005). As with trade flows and the gravity equation between countries, similar papers for trade flows and the gravity model are used (e.g. Bevan and Estrin, 2004; Benassy-Quere et al., 2007; Frenkel et al., 2004).

The Trade Openness Effect

Mohamed & Sidiropoulos (2010) found that trade openness is significant and has A positive sign as expected in all 36 countries, but did not have any significant results when applied only in MENA countries. Busse & Hefeker (2007) found that the coefficient of trade is positive and significant in cross-country analysis. Addison & Heshmati (2003) determined that openness to trade is positive and has significant impact on FDI into developing countries. Several studies have been published on the positive effects of the trade openness variable on FDI. The findings of Mina (2007a, 2007b, 2012), Goswami, & Haider (2014), Jadhav (2012), Noorbakhsh et al. (2001), Nonnemberg and Mendonca (2004), Dhakal et al. (2007) and Botric & Skuflic (2006) supported the positive influence played by openness in trade.

The Natural Resource Endowment Factor Effect

In the theory of determinants of natural resource endowment, there are two major arguments in the literature. Some believe that the impact of natural resource endowments such as oil and gas, is one of the most important factors in attracting FDI. So, it is expected that the factor of endowment in oil and gas is positively correlated with FDI (e.g. Khadaroo & Seetanah, 2009; Mohamed & Sidiropoulos, 2010). These studies hypothesized a negative correlation between FDI and natural resources, namely oil and gas, for the following four reasons: the first reason is that oil reserves are dominated by governments for the purpose of economic diversification; secondly, the resource boom has led to appreciation of the local currency; it will make exports of natural resources expensive and less competitive at world prices and foreign investment in non-natural resources sector; thirdly, through boom and bust, there will be increased volatility in exchange rates, which leads to FDI becoming expensive for foreign investors; and finally, the 'Dutch disease' theory was adequately tested by Corden & Neary (1982).

EMPIRICAL MODEL AND DATA

Data Specifications

In order to test the hypothesis concerning the location determinants of FDI inflows to MENA countries, this study combined the Dunning (1981) OLI (Ownership-Location-Internalization) paradigm with additional variables that were related to certain literature reviews. The theoretical foundation for the link between location determinants and FDI relies on the location dimension of Dunning's (1981), institutional dimension, and the new theory of trade.
A large unbalanced or incomplete panel data consisting of 17 MENA countries, was generated in this study conducted between 1960 and 2012. Some data or observations were missing certain cross-sectional units in the sample period, largely in natural resources in three approaches, human capital, and institutional quality variables. The dependent variable is inward FDI, defined in some of the literature as net inflows as a percentage of GDP (Mina, 2007a; Khadaroo & Seetanah, 2009; Ezeoha & Cattaneo 2012). In this study's model, the explanatory variables (independent variables) are grouped as: location dimension, institutional dimension, new theory trade, and other economic determinants. The inflation variable is one of the most common control variables in empirical FDI inflows; the inflation of annual consumer prices was used as a percentage (Asiedu, 2006; Onyeiwu & Shrestha, 2004). In addition, inflation rate is included to

capture the general price levels in each country. Inflation is expected to have both negative and positive signs. Infrastructure as one of the most fundamental determinants of FDI, including the telephone lines per 1000 people, used as a regressor in this study. This is deemed to be the best proxy for infrastructures. A positive relationship was expected between these variables.

Table 1
VARIABLES, DEFINITIONS AND DATA SOURCES

Variables	Definitions
Dependent Variable	
FDIIN	FDI, net inflows (% GDP)
Explanatory Variables	
TRADE	Trade (% of GDP)
Ln TRADE	Trade (% of GDP) in natural
GDP	Real GDP (2000 US$) constant
Ln GDP	Real GDP (2000 US$) constant
INFRASTRUCTURE	Telephone lines (per 100 people)
INFLATION	Consumer prices (annual %)
HUMAN CAPITAL	School enrolment, secondary (% gross)
FUEL	Fuel exports (% of merchandise exports)
Ln FUEL	Fuel exports (% of merchandise exports), in natural logarithmic form
OIL RENTS	Oil rents (% of GDP)
OIL PRODUCTION	Crude oil production (thousands of barrels per day).
OIL RESERVES	Crude oil reserves (billion barrels)
OIL (RELATIVE_PRODUCTION)	Oil production in millions of barrels per day
INSTITUTION QUALITY	nvestment profile (12 points, a score of 4 points equates to very low risk and a score of 0 points equates to very high risk)
INTERACTION1	Investment Profile * FUEL
INTERACTION2	Investment Profile * OIL RENTS
INTERACTION3	nvestment Profile * OIL PRODUCTION
INTERACTION4	Investment Profile * OIL RESERVES
INTERACTION5	Investment Profile * OIL (RELATIVE-PRODUCTION)

Sources: All data (1960-2012) from world development indicators (WDI)
Oil production and Oil reserved from the Energy Information Administration (2006) data (1980-2009)
Oil relative_production calculation based on Energy Information Administration (2006) data (1980-2009)
Institution- Investment Profile from ICRG data (1984-2009)
Note: Ln (natural logarithm form)

The first concern that arises in measuring human capital is finding a suitable variable as a proxy for education. School enrollment was chosen as the education measure in all estimations, and as a proxy for human capital. For institutional determinants, this variable is used as proxy for institutional determinants from ICRG (Mohamed & Sidiropoulos, 2010; Busse & Hefeker, 2007). The market-size was measured as a real GDP constant in natural logarithmic form (Mina, 2009; Mohamed & Sidiropoulos, 2010; Medvedev, 2011). A positive coefficient with FDI was expected. To assess the impact of trade openness on FDI, trade openness was measured as the sum of imports and exports as a percentage of real GDP in natural logarithmic form (Mina, 2007a and 2012; Mohamed & Sidiropoulos, 2010; Boubakri et al. 2013). Following Asiedu & Lien (2011) and Ezeoha & Cattaneo (2012), other economic variables were used in the baseline

model to determine how the total effect of investment profiles on FDI inflows is affected by natural resources. These are the interactions between investment profiles and natural resource endowment. The choice of variables and proxies was guided by the literature, and the best proxies used in the regressions depended significantly on the results. Annual data was relied on for the test hypothesis from different sources: the World Bank (2011) World Development Indicators (WDI, 1960-2012); Energy Information Administration (EIA, 2006) database (1980-2009) and ICRG data (1984-2009). The definitions of these variables and the sources of their data are contained in Table 1. In addition, Table 2 contains descriptive statistics on these baseline variables and Table 3 shows the correlation coefficient matrix.

Table 2
SUMMARY STATISTICS ON THE FDIIN AND ITS DETERMINANTS

Variable	Mean	Std. Dev	Min	Max
FDIIN	1.633	3.193	-8.295	23.53
INFLATION	9.694	28.16	-21.67	448.5
FUEL	54.49	40.76	0.0005	193.037
Ln FUEL	2.69	2.72	-7.55	5.26
OIL RENTS	23.69	22.23	0	113.39
INFRASTRUCTURE	8.791	8.083	0.0317	37.12
OIL PRODUCTION	1399.59	2139.52	-1.463	11545.7
OIL RESERVES	39.73	63.844	0	267.02
OIL (relative_production)	0.00037	0.0019	-0.004	0.0285
GDP	4.37e+10	4.92e+10	5.40e+08	2.80e+11
Ln GDP	23.83	1.32	20.10	26.35
TRADE	72.30	27.005	13.77	154.64
Ln TRADE	4.20	0.394	2.62	5.04
HUMAN CAPITAL	55.19	26.53	0	111.18
Institution (Investment Profile)	6.98	2.33	1.083	11.5

Note: All variables are defined in the methodology
Note: Negative sign in (FDIIN) WIR indicates that at least one of the three components of FDI is negative (equity capital, reinvested earnings or intra-company loans) and is not offset by positive amounts of the other components. These are instances of reverse investment or disinvestment
Note: Negative sign in (OILPRODUCTION) International Energy Statistic-Notes that negative refinery processing gain data values indicate a net refinery processing loss
Note: Ln (natural logarithm form)

Table 3
CORRELATION COEFFICIENT MATRIX

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	1											
(2)	0.48	1										
(3)	0.08	-0.26	1									
(4)	-0.09	-0.31	0.08	1								
(5)	0.11	0.32	0.23	-0.26	1							
(6)	0.30	0.45	0.27	-0.15	0.70	1						
(7)	0.36	0.30	0.16	-0.45	0.31	0.42	1					
(8)	-0.23	-0.21	0.31	0.11	0.40	0.31	0.16	1				
(9)	-0.08	0.10	0.37	-0.02	0.62	0.46	0.29	0.78	1			
(10)	0.08	-0.01	0.85	0.03	0.42	0.39	0.21	0.52	0.64	1		
(11)	0.05	0.10	0.73	-0.04	0.56	0.44	0.21	0.46	0.70	0.94	1	
(12)	-0.05	-0.07	0.01	-0.08	-0.15	-0.25	0.08	-0.26	-0.22	-0.14	-0.12	1

Note: Variables are (1) FDIIN, (2) Trade, (3) GDP, (4) Inflation (5) Infrastructure, (6) Human capital (7) Investment profile (8) Fuel, (9) Oil rents, (10) Oil production, (11) Oil reserves, (12) Oil (relative_ production)

Econometric Methodology and Model Specification

In this subsection, the baseline estimation model and econometric methodology used in this study have been described. These are based on the literature review and location advantages of Dunning's (1981) OLI paradigm, which relies on Mina (2007a & 2007b). In this section, empirical models are formulated to help address the main questions raised in this paper.

In general, all variables that have been found to be relevant in the empirical literature have been included. Additionally, some macroeconomic variable determinants of FDI are included, which have been widely used and tested in many empirical studies for both developing and developed countries. These are inflation, market size, economic growth, real interest rate, and real exchange rate. For economic growth, interest rate and exchange rate are statistically insignificant variables. It is worth noting that the correlation matrix in Table 3 showed evidence of high correlation between human capital and infrastructure. This suggested that two models are required to avoid multicollinearity, as Asiedu (2006) used in the research. For the purpose of analysis, the equation adopted the FDI inflows regression approach, where the FDI inflows are specified as a function of a set of independent variables. The FDI inflows were modelled as a function of trade openness, natural resources, gross domestic product (GDP constant), inflation, human capital (education), infrastructures, and investment profile (institutional quality) of output. Hence, the following model has been estimated (equation (1)):

$$FDIIN_{it} = \alpha_o + \beta_1 TRADE_{it} + \beta_2 NATURAL\ RESOURCES_{it} + \beta_3 GDP_{it} + \beta_4 INFLATION_{it} + \beta_5 HUMAN\ CAPITAL_{it} + \beta_6 INFRASTRUCTURE_{it} + \beta_7 INSTITUTION_{it} + \mu_{it} \quad (1)$$

In this model, FDIIN is net inflows as a percentage of (GDP) gross domestic products and is the dependent variable. The independent variables are TRADE as % of GDP in the natural logarithm form; NATURAL RESOURCES employs five measures of natural resources which are: (I) the share of fuel in total merchandise exports in natural logarithmic form; (II) oil rents % GDP; (III) oil production in thousands of barrels per day; (IV) oil reserves in billions of barrels per day; and (V) oil (relative_production) oil production in millions of barrels per day relative to oil reserves in millions of barrels per day. These five measures of natural resources were used to provide oil as the most important sector to attract FDI in MENA countries. GDP is real gross domestic product, which is a proxy for market size in natural logarithmic form. Infrastructure is represented by the number of telephone lines (per 1000 people). Inflation is represented by the consumer prices (annual %); Human Capital is school enrollment [secondary (% gross)].Institution is investment profile; μ_{it} is the error term. The subscripts I and t represent country and time, respectively. Also, i=1, …, N; t=1, …,T. The error term μ consists of country and time specific effects as follows:$\mu_{it} = \nu_i + \gamma_t + \varepsilon_{it}$(2). ν_i denotes the country-specific effects that are time-invariant for example, geography and demographics may be correlated with explanatory variables. γ_t is the time-specific fixed effects, and is capable of picking up the impact of any crises that affect any of the countries in the sample. $\varepsilon_{it}$by assumption is an independently and identically distributed component with zero mean and variance (0, σ^2) over time and across countries. The most recent study that tested the interaction between natural resource and democracy was Asiedu & Lien (2011). The above equation was extended to include

an interaction term. The interaction term is estimated by adding β_8 (NATURAL RESOURCES$_{it}$ * INSTITUTION $_{it}$) to equation (1) as follows:

$$FDIIN_{it} = \alpha_o + \beta_1 TRADE_{it} + \beta_2 NATURAL\ RESOURCES_{it} + \beta_3 GDP_{it} + \beta_4 INFLATION_{it} + \beta_5 HUMAN\ CAPITAL_{it} + \beta_6 INFRASTRUCTURE_{it} + \beta_7 INSTITUTION_{it} + \beta_8 (NATURAL\ RESOURCES_{it} * INSTITUTION_{it}) + \mu_{it} \quad (3)$$

The error term μ consists of country-and-time specific effects and is given by:

$$\mu_{it} = \nu_i + \gamma_t + \varepsilon_{it} \quad (4)$$

Equation (3) hypothesized that inward FDI is determined by institutional quality and natural resources, together with additional control variables as described earlier. The interaction term between natural resources and investment profile is expected to shed light on the theoretical expectations outlined by Asiedu & Lien (2011); and Ezeoha and Cattaneo (2012). Equation (3) has been estimated to answer the question: "Do natural resources alter the relationship between institutional quality and natural resources?". Thus, differentiating Equation (4) with respect to natural resources and institutional quality, alternatively, gives the following:

$$\frac{\partial FDIIN\ it}{\partial NATURAL\ RESOURCES\ it} = \beta_2 + \beta_8 INSTITUTION_{it} \quad (5)$$

$$\frac{\partial FDIIN\ it}{\partial INSTITUTION\ it} \beta_7 + \beta_8 INATURAL\ RESOURCES_{it} \quad (6)$$

From Equation (6), in some regressions, $\beta_7>0$ and significant; $\beta_8<0$ and insignificant. This result suggested that natural resources significantly alter the relationship with FDI by reducing the positive effect of investment profile on FDI. Following Mina (2007a, 2007b, 2009, 2012), Onyeiwu (2003) and Onyeiwu & Shrestha (2004), estimated the two model parameters as has been pointed out before, using panel fixed-effect and random-effect models. The Hausman model test was performed to assess the suitability of the fixed-effect models or random-effect models. The Hausman test was motivated by the fact that the fixed effect and the random effect should not be different for the case where μ_i is uncorrelated with the regressors. Alternatively, robust check methods were used for all estimations. Examining the multi-collinearity to check two or more variables in a multiple regression model can show whether they are highly correlated or not. In order to detect multi-collinearity, the Variance Inflation Factors (VIF) were examined (Tables 4-6). Most of the earlier work on empirical inward FDI conducted analysis using panel data methods (such as Asiedu et al., 2009; Boubakri et al., 2013; Asiedu & Lien, 2011; Khadaroo & Seetanah, 2009). These researchers addressed the endogeneity problem between the independent variables and the dependent variables and measured with errors. To illustrate the dynamic panel methodology, specifically, the lagged dependent variable is included in the model as follows:

$$FDIIN_{it} - FDIIN_{it-1} = (\alpha - 1) FDIIN_{it-1} + \beta X_{it} + \mu_{it} \quad (7)$$

$$\mu_{it} = \nu_i + \gamma_t + \varepsilon_{it} \quad (8)$$

For all i=1, …, N; t=1, …, T

Equation (3.7) can be rewritten as:

$$FDIIN_{it} = \alpha FDIIN_{it-1} + \beta X_{it} + \nu_i + \gamma_t + \varepsilon_{it} \quad (9)$$

Where,$FDIIN_{it}$is the dependent variable; and X_{it} is the vector of explanatory variables; ν_i represents unobserved country-specific effects; γ_t represents the time-specific effects; ε_{it} is an independently and identically distributed component with zero mean and variance (0, σ^2) over time and across countries; and subscripts i and t denote country and time periods, respectively. The dynamic panel model includes lagged values of the dependent variable as regressors, so the model introduced an endogeneity problem by construction, as it is correlated with the differenced error terms $E[FDIIN_{i,t-1,}\varepsilon_{i,t}] \neq 0$. This is because $FDIIN_{it-1}$ depends on ε_{it-1} which is a function of ν_i and γ_t as competents in μ_{it}.In this regard, it is possible to wipe out the unobserved country-specific effect by the difference of equation as follows:

$$\Delta\, FDIIN_{it} = \alpha\, \Delta\, FDIIN_{it-1} + \beta\, \Delta\, X_{it} + \Delta\, \gamma_t \quad (10)$$

The system GMM overcomes the bias problems of the difference GMM estimator by taking both equations in level (9) and in differences (10) together. The estimator assumes that the country-specific effects are uncorrelated with the first difference of the dependent variable and the independent variables. Therefore, along with the usual assumptions of the difference GMM, system GMM has two extra moment conditions, which are that the original error term, ε_{it}, which is serially uncorrelated, and the explanatory variables, which are weakly exogenous. The following are moment conditions:

$$E\left[FDIIN_{i,t-s,}\Delta\varepsilon_{i,t}\right] = 0\ For\ s \geq 2; t = 3, \ldots., T \quad (11)$$

and

$$E\left[X_{i,t-s,}\Delta\varepsilon_{i,t}\right] = 0\ For\ s \geq 2; t = 3, \ldots., T \quad (12)$$

Moreover, the following orthogonality restrictions are further imposed:

$$E\left[\Delta FDIIN_{I,T-S,}\varepsilon_{i,t}\right] = 0\ For\ s = 1 \quad (13)$$

And

$$E\left[\Delta X_{i,t-s}\varepsilon_{i,t}\right] = 0\ For\ s = 1 \quad (14)$$

The efficiency of the GMM estimator depends on the absence of serial correlation and the validity of lagged values as instruments. To test for autocorrelation, the Arellano & Bond (1991) test of autocorrelation has been applied (Roodman, 2009). This test has a Chi-square distribution with j-k degrees of freedom; j being the number of instruments and k the number of regressors. As a final step, standard errors are corrected for small-sample bias based on the two-step covariance matrix attributed to Windmeijer (2005), as for the one-step estimator, standard errors permit heteroskedasticity in ε_{it}. In view of the above, the study first estimated an equation (1) using panel fixed-effect models. The Hausman specification test was performed to assess the suitability of the fixed-effect models against random-effect models. To answer the question: "Do natural resources alter the relationship between institutional quality and foreign direct investment?", the following equation was estimated:

$$FDIIN_{it} = \alpha FDIIN_{it-1} + \beta_1 X_{it} + \beta_2 NATURAL\ RESOURCES_{it} * INSTITUTION_{it} \ldots\ldots + \mu_i + \gamma_{i,t} \quad (15)$$

An autocorrelation test was performed to check the validity of the instruments. The test for autocorrelation found spurious autocorrelation of Order 1 and no autocorrelation in Order 2. In contrast, in the estimation with interaction between natural resources and institutional quality in the first model, there is autocorrelation of Order 1 and Order 2 also; however, in the second model with interaction there is autocorrelation of Order 1 and no autocorrelation in Order 2. In addition, the Hansen test for over-identifying restrictions gives a valid and perfect *p* value of 1.00. These estimations were conducted to check the robustness of the result and for comparison with the existing literature. The study has following limitations:

1. *Empirical evidence which includes fuel as a proxy for a natural resource is limited (e.g., Mohamed & Sidiropoulos, 2010; Onyeiwu, 2003).*
2. *None of the literature includes oil rents as a proxy for natural resources as in the study.*
3. *None of the empirical literature on the determinants of FDI examines the effect of the three approaches to oil which Mina (2007a) applied in the six Gulf Cooperation Council (GCC) countries.*

RESULTS AND DISCUSSION

Empirical Results

In this section, the estimation results related with the effects of oil and the main location determinants of FDI in MENA countries were estimated. In all regressions, robust standard errors were used to ensure that the estimates are not biased and are efficient. The FDI inflows model using three different methods – Fixed Effects (FE), Random Effects (RE) and the GMM estimation method. These estimations were conducted to check the robustness of the result and to compare with existing literature.

A number of explanatory variables were used, such as interest rate and exchange rate, but none of these variables had any statistical significance. VIF is reported for all models, and it is concluded that multicollinearity does not seem to be a problem, with no VIF mean being substantially higher than 1, which was not enough to be of concern. To account for multicollinearity between infrastructures and human capital, the estimation using two models in the baseline models were undertaken. The fixed-effects and random-effects results in all models without interaction were examined. Additionally, the Hausman test was used, which recommends using fixed effects in all models. Only in the estimation of oil reserves with human capital variable does the Hausman test recommend using random effects.

Descriptive Statistics

Descriptive statistics for the main variables are presented in Table 2. The negative sign of inward FDI can be observed that refers to the components (equity capital, reinvestment of earnings, other long-term capital, and short-term capital, as shown in the balance of payments) and the rest of net inflows (new investment inflows less disinvestment), with the net inflows divided by GDP (World Bank Indicators). In addition, the International Energy Statistic notes that the total oil supply includes the production of crude oil, natural gas plant liquids, other liquids, and refinery processing gains. It also mentioned that negative refinery processing gain data values indicated a net refinery processing loss.

Table 3 presents the correlation matrix of the main variable. It was observed that infrastructure and human capital were strongly correlated, but this correlation poses no concern as they do not enter the regression at the same time. Likewise, there are strong correlations between oil rents and oil production, and between oil rents and oil reserves. There is a high correlation between GDP constant and oil production, and also a high correlation between GDP constant and oil reserves.

Effects of Fuel and Oil Rents, Fixed Effects (FE)

Table 4 presents the estimation results of equation (1). Models 1 and 2 are alternative models in which fuel is used as the measure of natural resources. Models 3 and 4 used oil rents as the alternative measure of natural resources. The fixed effects estimated for the impact of fuel exports on FDI flows is positive and significant at 1% in both models. This result corroborated the earlier evidence from Asiedu (2006) and Mohamed and Sidiropoulos (2010). This suggested that oil encourages FDI to MENA regions.

Table 4
DV: INWARD FDI PERCENTAGE OF GDP, PANEL ANALYSIS, COUNTRY FIXED-EFFECTS (MODEL BASED ON CORRELATION MATRIX). IMPACT OF FUEL AND OIL RENTS

Regressor	**(1)**	**(2)**	**(3)**	**(4)**
Ln TRADE	1.782 (0.166)	2.032 (0.292)	2.067 (0.182)	1.534 (0.408)
Ln FUEL	1.610*** (0.000)	1.324*** (0.000)		
OIL RENTS			-0.067 (0.369)	-0.048 (0.434)
Ln GDP	4.030*** (0.001)	4.406*** (0.001)	5.687** (0.033)	5.081** (0.010)
INFLATION	0.076* (0.097)	0.069** (0.035)	0.078 (0.103)	0.0898** (0.036)
INFRASTRUCTURE		-0.001 (0.981)		-0.0434 (0.644)
HUMAN CAPITAL (Education)	-0.011 (0.534)		-0.052 (0.229)	
INSTITUTION (Investment profile)	0.020 (0.902)	-0.023 (0.872)	0.234 (0.383)	0.144 (0.535)
CONSTANT	-106.2*** (0.001)	-117.35*** (0.000)	-141.36** (0.031)	-28.05** (0.010)
Collinearity diagnostics (VIF)				
TRADE	2.91	2.56	2.95	2.25
FUEL	1.60	1.78		
OIL RENTS			1.53	1.53
GDP constant	2.13	1.88	2.30	1.84
INFLATION	1.42	1.35	1.49	1.50
INFRASTRUCTURE		1.62		1.72
HUMAN CAPITAL (Education)	1.76		1.94	
INSTITUTION (Investment profile)	1.68	1.61	1.68	1.65
Mean VIF	1.92	1.80	1.98	1.75
N. Observations	176	229	194	266
N. Countries	13	14	14	15
F test	98.03*** (0.0000)	29.61*** (0.0000)	5.97*** (0.0035)	22.59*** (0.0000)

Hausman test	42.19*** (0.0000)	74.38*** (0.0000)	11.96* (0.0628)	20.15*** (0.0026)

Note: Ln (natural logarithm form)
Notes: p-value in parentheses, *significant at 10%, **significant at 5%, ***significant at 1%

Effects of Fuel and Oil Rents, Random Effects (RE)

The results are reported in Table 5 for estimation of equation (1). Models 1 and 2 represent results where the fuel is used as a measure of natural resources; whereas, Models 3 and 4 represent results where the oil rents are used as the measure of natural resources. The main variable, fuel exports, is positive and significant at 1%, and oil rents are negative and significant at 10%, consistent with the results by Ezeoha & Cattaneo (2012). The GDP constant is positively signed and significant as expected at 5% in all the models, and these results are consistent with Hisarciklilar et al. (2006), Goswami & Haider (2014), Asiedu (2006) and Mohamed & Sidiropoulos (2010).

Table 5
DV: INWARD FDI PERCENTAGE OF GDP, PANEL ANALYSIS, COUNTRY RANDOM-EFFECTS (MODEL BASED ON CORRELATION MATRIX). IMPACT OF FUEL AND OIL RENTS

Regressor	**(1)**	**(2)**	**(3)**	**(4)**
LnTRADE	3.719* (0.052)	3.854** (0.044)	4.228** (0.016)	3.218* (0.070)
Ln FUEL	1.075*** (0.001)	0.690 (0.102)		
OIL RENTS			-0.000 (0.145)	-0.085* (0.099)
Ln GDP	1.639** (0.025)	1.541** (0.035)	3.259** (0.015)	1.887** (0.035)
INFLATION	0.0659 (0.123)	0.0591** (0.039)	0.0695 (0.115)	0.092** (0.031)
INFRASTRUCTURE		0.0357 (0.604)		0.0395 (0.404)
HUMAN CAPITAL (Education)	0.009 (0.470)		-0.0023 (0.410)	
INSTITUTION (Investment profile)	0.243 (0.290)	0.48 (0.220)	0.392 (0.223)	0.375 (0.175)
CONSTANT	-58.91*** (0.000)	-56.30*** (0.000)	-93.77** (0.015)	-59.38** (0.035)
N. Observations	176	229	194	66
N. Countries	13	14	14	15
Wald Chi2	58.10*** (0.0000)	71.81*** (0.0000)	57.41*** (0.0000)	21.41*** (0.0015)
Hausman test	42.19*** (0.0000)	74.38*** (0.0000)	11.96* (0.0628)	20.15*** (0.0026)

Notes: p-value in parentheses, *significant at 10%, **significant at 5%, ***significant at 1%
Note: Ln (natural logarithm form)

Effects of Oil Production, Oil Reserves and Oil Relative_Production, Fixed Effects (FE)

Additionally, equation (1) is re-estimated such that oil production, oil reserves and oil relative production are replaced with fuel and oil rents. The results are shown in Table 6 using the fixed effects estimation technique for the alternative measure of natural resources. In all the tables, Models 1 and 2 represent results, where oil production is used as a measure of natural resources; whereas, models 3 and 4 represented results where oil reserves are used as a measure of natural resources. Models 5 and 6 represent outcomes where oil relative production is used as a measure of natural resources.

In Table 6, fixed-effect results were presented. It was found for the MENA region that the main variables, which were significant were oil production at 5% in the first model. However, these had a negative coefficient. In Table 6, the fixed-effects results also showed that inflation is positive and significant at 10% in Model 1 and significant at 5% in Model 2. Trade openness is positive and significant at 10% only in Model 1, consistent with the earlier evidence (Mohamed & Sidiropoulos, 2010; Sekkat & Varoudakis, 2007). Human capital, investment profile, and infrastructures do not have any significant results.

Models 3 and 4 are the results for alternative measures in which the oil reserves are used as a proxy for natural resources. The results concluded that oil reserves as a second approach to oil as a proxy for natural resources have a negative sign and are insignificant in Model 3, and have a negative influence on FDI inflows and significance of 10% in Model 4. For instance, an increase in oil reserves by 1% reduces FDI inflows by about 0.01%. Rogmans and Ebbers (2013) suggested that for MENA countries, oilrich countries have not actively encouraged FDI. In fact, they have enough financial resources and foreign currency with large oil reserves, which they might prefer to be purchased through contractual arrangement and licensing rather than share foreign investment in their own natural resources. Estimates also show that GDP is a constant positive and significant at 5% in Models 3 and 4, while inflation encouraged FDI flows to MENA countries, which is positive and significant at 5% in Model 4. The impact of human capital, trade, infrastructure and investment profiles were not significant. In Table 6 in Models 5 and 6, with oil production relative to oil reserves as a proxy for natural resources, the results indicated that oil production relative to oil reserves is negative and insignificant. GDP is a constant positive and significant at 5% in both Models 5 and 6. Inflation is positive and significant at 5% in Model 6. This result corroborated the earlier evidence from Asiedu (2002) and Addison & Heshmati (2003).

Effects of Oil Production, Oil Reserves and Oil Relative Production, Random Effects (RE)

As pointed out in the preceding sections, Equation (1) is reestimated such that oil production, oil reserves and oil relative production are replaced with fuel and oil rents. The results using the randomeffects estimation technique are shown in Table 7 for the alternative measure of natural resources. In all the tables, Models 1 and 2 represent the results, where oil production is used as a measure of natural resources; whereas, Models 3 and 4 represented the results, where oil reserves is used as a measure of natural resources. Models 5 and 6 represented results where oil relative production is used as a measure of natural resources.

Table 7 presents random-effects GLS estimate results without interaction between investment profile as a proxy for institutional quality and oil as a proxy for natural resources. In Model 1 in Table 7 with oil production as a proxy for natural resources. In the Model 3 in Table

7 oil reserves are proxy for natural resources; in Model 5 in Table 7 oil production relative to oil reserves is proxy for natural resources.

Depending on the results from the random-effects GLS estimation, in the Model 1 oil production is negative and significant at 10%. For example, an increase in oil production by 1% reduces FDI inflows by 0.01%. Trade openness is positive and significant at 5%. These results suggested that countries with larger GDP are more likely to be successful in attracting FDI (e.g. Jadhav, 2012; Blonigen, 2005; Hisarciklilar et al., 2006). The coefficient of the GDP constant is significant at 5% and 1% in Model 1 and Model 2 respectively. This result corroborated the earlier findings (Abdul Mottaleb & Kalirajan, 2010; Asiedu, 2002, 2006; Onyeiwu & Shrestha, 2004).

Table 6
DEPENDENT VARIABLE (DV): INWARD FDI PERCENTAGE OF GDP, PANEL ANALYSIS, COUNTRY FIXED-EFFECTS (MODEL BASED ON CORRELATION MATRIX). IMPACT OF OIL PRODUCTION, OIL RESERVES, AND OIL RELATIVE_ PRODUCTION.

Regressor	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Ln TRADE	2.210* (0.070)	0.507 (0.791)	1.240 (0.314)	0.429 (0.827)	0.754 (0.509)	0.390 (0.848)
OIL (production)	-0.002** (0.045)	-0.0004 (0.239)				
OIL (reserves)			-0.046 (0.105)	-0.016* (0.066)		
OIL (relative_ production)					-109.99 (0.316)	-105.63 (0.338)
Ln GDP	5.953** (0.027)	5.441** (0.013)	5.575** (0.031)	5.138** (0.010)	5.384** (0.033)	5.132** (0.012)
INFLATION	0.0787* (0.086)	0.088** (0.027)	0.0713 (0.118)	0.083** (0.025)	0.067 (0.148)	0.077** (0.028)
INFRASTRUCTURE		-0.0360 (0.687)		-0.028 (0.745)		-0.051 (0.601)
HUMANCAPITAL (Education)	-0.039 (0.313)		-0.047 (0.247)		-0.046 (0.255)	
INSTITUTION (Investment profile)	0.213 (0.397)	0.120 (0.585)	0.206 (0.431)	0.107 (0.616)	0.214 (0.429)	0.103 (0.636)
CONSTANT	-147.26** (0.024)	-132.54** (0.013)	-135.30** (0.029)	-124.94** (0.011)	-129.98** (0.031)	-125.04** (0.013)
Collinearity diagnostics (VIF)						
TRADE	3.17	2.43	3.16	2.40	2.91	2.22
OIL (production)	2.21	2.25				
OIL (reserves)			1.90	2.05		
OIL (relative_ production)					1.16	1.04
GDP constant	3.47	3.28	3.06	2.84	2.09	1.65
INFLATION	1.56	1.45	1.52	1.45	1.49	1.45
INFRASTRUCTURE		1.54		1.55		1.60
HUMAN CAPITAL (Education)	1.85		1.88		2.12	
INSTITUTION (Investmentprofile)	1.67	1.62	1.70	1.64	1.71	1.63
Mean VIF	2.32	2.09	2.20	1.99	1.91	1.60
N. Observations	194	266	190	262	189	261
N. Countries	14	15	14	15	13	14

F test	4.59** (0.0102)	20.14*** (0.000)	10.31*** (0.0003)	13.84*** (0.0000)	5.04*** (0.0085)	16.51*** (0.0000)
Hausman test	11.29* (0.0797)	16.25** (0.0125)	6.92 (0.3285)	11.98* (0.0625)	13.68** (0.0334)	27.43** (0.0001)

Notes: p-value in parentheses, *significant at 10%, **significant at 5%, ***significant at 1%
Note: Ln (natural logarithm form)

The main results in Table 7 showed that inflation has a positive sign and is significant at 10% in Model 1; and in Model 2, it is significant at 5%. Trade is positive and significant in the Model 1 at 5%. On the other hand, human capital, investment profile, and infrastructure did not show any significant results. In Models 3 and 4, oil reserves are negative, and significant at 5% only in Model 4. Trade is significant at 10% and GDP is constant at 1%. In contrast, inflation is positive and significant at 5%. Still, human capital, investment profiles, and infrastructure do not appear to have any significant results. The results indicated that trade was significant at 5% in Model 5, and significant at 10% in Model 6. The GDP constant is positive and significant at 1%. Inflation has an incorrect sign and is significant at 5% in Model 6. Oil production relative to oil reserves, human capital, infrastructure, and investment profile proved to be statistically insignificant.

Table 7
DEPENDENT VARIABLE: INWARD FDI PERCENTAGE OF GDP, PANEL ANALYSIS, COUNTRY RANDOM-EFFECTS (MODEL BASED ON CORRELATION MATRIX). IMPACT OF OIL PRODUCTION, OIL RESERVES AND OIL RELATIVE_ PRODUCTION

Regressor	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Ln TRADE	2.638** (0.044)	1.466 (0.388)	2.256* (0.074)	1.354 (0.427)	3.548** (0.016)	2.40* (0.098)
OIL (production)	-0.001* (0.099)	-0.0006 (0.158)				
OIL (reserves)			-0.0370 (0.112)	-0.027** (0.029)		
OIL (relative_ production)					-161.03 (0.209)	-98.01 (0.299)
Ln GDP	4.640** (0.011)	3.003*** (0.009)	4.019*** (0.009)	2.88*** (0.003)	1.404*** (0.000)	0.564 (0.161)
INFLATION	0.071* (0.0.088)	0.088** (0.018)	0.063 (0.117)	0.083** (0.012)	0.054 (0.165)	0.072** (0.024)
INFRASTRUCTURE		0.0297 (0.708)		0.040 (0.611)		0.010 (0.870)
HUMAN CAPITAL (Education)	-0.093 (0.321)		-0.029 (0.329)		-0.009 (0.597)	
INSTITUTION (Investment profile)	0.285 (0.313)	0.292 (0.258)	0.298 (0.320)	0.258 (0.301)	0.437 (0.214)	0.384 (0.173)
CONSTANT	-118.88** (0.010)	-78.91** (0.013)	-103.21*** (0.009)	-75.21*** (0.007)	-50.04*** (0.001)	-25.51* (0.094)
N. Observations	194	266	190	262	189	261
N. Countries	14	15	14	15	13	14
Wald Chi2	30.13*** (0.000)	26.61*** (0.0002)	34.85*** (0.000)	48.74*** (0.000)	47.46*** (0.000)	36.37*** (0.0004)

Hausman test	11.29* (0.0797)	16.25** (0.0125)	6.92 (0.3285)	11.98* (0.0625)	13.68** (0.0334)	27.43** (0.0001)

Notes: p-value in parentheses, *significant at 10%, **significant at 5%, ***significant at 1%
Note: Ln (natural logarithm form)

The results from fixed effect and random effect confirmed that natural resources trade, GDP constant and inflation are the main determinants of FDI in MENA countries. However, the different types of natural resources have different effects on FDI in MENA countries. For instance, fuel exports attract FDI to MENA countries. In contrast, natural resources such as oil rents, oil production, and oil reserves discourage FDI inflows. These findings provide support for the suggestion that natural resources are not always resource-seeking as Dunning (1981) predicted in his hypothesis. Moreover, applying "Dutch disease" and "resource curse" to the FDI in MENA region is the hypothesis that a country's energy endowment is negatively associated with FDI.

Effects of Fuel and Oil Rents with Interaction, Fixed Effects (FE)

The estimations differ from the previous regressions by the inclusion of interaction terms between natural resources and investment profile. Models 1 and 2 are alternative models in which fuel is used as the measure of natural resources. Models 3 and 4 used oil rents as an alternative measure of natural resources. The fixed-effects results are reported in Table 8 with the interaction between oil as a proxy for natural resources and investment profile as a measure for institutional quality. It should be remembered that different measures of natural resources were used, which were fuel exports and oil rents as a proxy for natural resources. Fuel exports are positive and significant at 1%, but oil rents do not have any statistically significant results. The GDP constant had a positive sign and was significant at 1% in the first and second models as expected and significant at 5% in the third and fourth models. Inflation had a positive sign and was significant at 5% in the second and fourth models and significant at 10% in the third model. Trade, human capital, investment profile and infrastructure did not have any significant results. The interaction between fuel exports and investment profile is negative and significant at 5% in the first and second models; and the interaction between oil rent and investment profile is negative and significant at 10% in the third model.

Effects of Fuel and Oil Rents with Interaction, Random Effects (RE)

Table 9 presents the estimation results of equation (3) by including the interaction terms between natural resources and investment profile. The results in column 1 and 4 are for RE. Models 1 and 2 are alternative models, in which the fuel is used as the measure of natural resources. Models 3 and 4, on the other hand, are the models using oil rents as the alternative measure of natural resources. In models with the interaction term, the coefficient of investment profile becomes higher and significant when the interaction term is included. Natural resources (fuel exports) appear to reinforce this mitigation effect, as the overall effect is statistically significant.

Effects of Oil Production, Oil Reserves and Oil Relative Production with Interaction, Fixed Effects (FE)

The interaction term between natural resources and investment profile is then added into the same regression. The results using the fixed-effects estimation technique are shown in Table 10 of equation (3) for the alternative measure of natural resources. Models 1 to 6 are alternative models in which the oil production, oil reserves and oil relative production are used as the alternative measure of fuel and oil rents. Models 1 and 2 represent results, where oil production is used as a measure of natural resources; whereas, Models 3 and 4 represent results where oil reserves is used as a measure of natural resources. Models 5 and 6 represent results where oil relative production is used as a measure of natural resources.

Table 10 provides the results of the fixed-effects estimations with the interaction between investment profile as a proxy for institutional quality, and oil as a proxy for natural resources. In Model 1 and Model 3 of Table 10, oil reserves serve as a proxy for natural resources. The coefficient of oil production is negative and significant at 5% in Model 2. This is consistent with previous findings (Mina, 2007a, 2009). In Models 3 and 4, the fixed-effects results showed that the oil reserves as a proxy for natural resources does not have any significant results. The proxy for infrastructure development, trade, human capital, and investment profile appeared to be insignificant in all models. For the effect of the macroeconomic variables, the inflation coefficient estimated is positive and significant at 10% in Models 1 and 2, and significant at 5% in Models 2, 4, and 6.

The results of Models 5 and 6 included oil relative production as a proxy for natural resources. The outline shows that oil production is relatively insignificant. Inflation is positive and significant at 5% in Model 6. Still, the GDP constant is significant at 5% and has the expected positive sign. Trade, human capital, infrastructure and investment profile did not appear to have any significant results. The interaction term between oil relative production and investment profile is negative and significant at 10% in Model 6. Asiedu & Lien (2011) suggested that the negative sign undermines the positive effects of the investment profile on FDI in MENA countries. Furthermore, the negative sign plays a substantive role in enhancing FDI (Mina, 2012; Ezeoha & Cattaneo, 2012).

Effects of Oil Production, Oil Reserves and Oil Relative Production with Interaction, Random Effects (RE)

In Table 11, attention is directed to the models involving the interaction term between natural resources and investment profile for equation (3) for the alternative measure of natural resources. The results used the random-effects estimation technique, and Models 1 to 6 are alternative models in which oil production, oil reserves and oil relative production are used as the alternative measure of fuel and oil rents. Models 1 and 2 represented results, where oil production is used as a measure of natural resources; whereas, Models 3 and 4 represent results where oil reserves are used as a measure of natural resources. Models 5 and 6 presented results where oil relative production (Tables 6,7,10,11) is used as a measure of natural resources.

Table 11 compared the results of the random-effects GLS estimates with the interaction between investment profile as a proxy for institutional quality and oil as a proxy for natural resources. In Model 5 in Table 11, with oil production relative to oil reserves serves as a proxy for natural resources. The empirical evidence in Table 11 has shown that oil production has a negative influence on FDI inward at 1% in Model 2. For example, in Model 1 and increase in oil

production by 1% decreased FDI inflows by about 0.01%. Trade openness is positive and significant at 5%. Increasing trade openness by 1% increased FDI in MENA countries by 2.30%. This finding supported the earlier evidence by Asiedu (2002). In addition, the GDP constant is positive and significant at 1% in Model 1 and Model 2, respectively. The positive coefficient of inflation is confirmed by, for example, Jadhav (2012). The positive and significant influence of inflation at 10% and 5% on FDI inflows is because the effect of inflation on the current consumption reduces the cost of investment (Ezeoha & Cattaneo, 2012). The coefficients of human capital and infrastructures are insignificant. The investment profile is positive and significant at 5% in Model 2. This result shows that an improved institutional quality will increase FDI in the MENA countries. This supports the findings of Busse & Hefeker (2007), Mina (2009), Mohamed & Sidiropoulos (2010), and Boubakri et al. (2013).

The results from fixed effect and random effect methods including the interaction term confirmed that natural resources trade, GDP constant, inflation and investment profile are the main determinants of FDI in MENA countries. However, the different types of natural resources have different effects on FDI in these countries. These findings provided support for the argument that natural resources are not always resources seeking as Dunning (1981) predicted in the hypothesis. Moreover, applying 'Dutch disease' and 'resource curse' to FDI in the MENA region is the hypothesis that a country's energy endowment is negatively associated with FDI.

GMM RESULTS

Table 8
DEPENDENT VARIABLE: INWARD FDI PERCENTAGE OF GDP, PANEL ANALYSIS, COUNTRY FIXED-EFFECTS (MODEL BASED ON CORRELATION MATRIX). IMPACT OF FUEL AND OIL RENTS WITH INTERACTION.

Regressor	(1)	(2)	(3)	(4)
Ln TRADE	1.955 (0.143)	2.358 (0.215)	0.414 (0.696)	1.242 (0.389)
Ln FUEL	1.740*** (0.000)	1.441*** (0.000)		
OIL RENTS			0.134 (0.149)	0.007 (0.942)
Ln GDP	4.131*** (0.001)	4.475*** (0.001)	5.917** (0.021)	5.146** (0.011)
INFLATION	0.079 (0.102)	0.0706** (0.046)	0.093* (0.089)	0.091** (0.035)
INFRASTRUCTURE		-0.006 (0.865)		-0.051 (0.611)
HUMAN CAPITAL (Education)	-0.011 (0.497)		-0.053 (0.176)	
INSTITUTION (Investment profile)	0.112 (0.169)	0.063 (0.539)	0.459 (0.147)	0. 226 (0.544)
INTERACTION1 (Investment profile*Fuel)	-0.0577** (0.020)	-0.0447** (0.017)		
INTERACTION2 (Investment profile*Oil Rents)			-0.018* (0.059)	-0.005 (0.676)
CONSTANT	-109.69*** (0.001)	-118.9*** (0.000)	-142.40** (0.021)	-129.22** (0.011)
N. Observations	176	229	194	266

N. Countries	13	14	14	15
F Test	476.00*** (0.0000)	74.34***(0.0000)	4.48*** (0.0096)	98.97*** (0.0000)
Hausman test	82.09*** (0.0000)	58.33*** (0.0000)	15.15** (0.0341)	19.76*** (0.0061)

Notes: p-value in parentheses, *significant at 10%, **significant at 5%, ***significant at 1%
Note: Ln (natural logarithm form)

System GMM-estimation is shown in Table 12. The point estimates revealed that almost all variables included were statistically significant. The Hansen over-identification test is satisfactory and does not reject the null hypothesis that instruments are valid and equal to 1.00. The test for the first- and second-order residual autocorrelation in Model 1 estimators AR (1) and AR (2) errors indicated that we should reject the null hypothesis of no evidence of serial correlation in the first-order residual, but we can accept the null hypothesis in the second-order residual.

Table 9
DEPENDENT VARIABLE: INWARD FDI PERCENTAGE OF GDP, PANEL ANALYSIS, COUNTRY RANDOM-EFFECTS (MODEL BASED ON CORRELATION MATRIX). IMPACT OF FUEL AND OIL RENTS WITH INTERACTION

Regressor	**(1)**	**(2)**	**(3)**	**(4)**
Ln TRADE	4.679** (0.036)	4.729** (0.022)	3.161** (0.033)	3.168* (0.053)
Ln FUEL	1.172*** (0.000)	0.927*** (0.003)		
OIL RENTS			0.055 (0.460)	-0.052 (0.509)
Ln GDP	1.287*** (0.005)	1.250*** (0.009)	3.356*** (0.006)	1.755** (0.032)
INFLATION	0.0699 (0.157)	0.0615* (0.073)	0.081 (0.111)	0.093** (0.035)
INFRASTRUCTURE		0.032 (0.614)		0.038 (0.638)
HUMAN CAPITAL (Education)	0.014 (0.290)		-0.0250 (0.338)	
INSTITUTION (Investment profile)	0.519*** (0.000)	0.499*** (0.000)	0.583 (0.120)	0. 442 (0.308)
INTERACTION1 (Investment profile*Fuel)	-0.124*** (0.000)	-0.107*** (0.000)		
INTERACTION2 (Investment profile*Oil Rents)			-0.014 (0.102)	-0.003 (0.774)
CONSTANT	-54.48*** (0.000)	-53.107*** (0.000)	-93.52*** (0.008)	-56.603** (0.036)
N. Observations	176	229	194	266
N. Countries	13	14	14	15
Wald Chi2	651.38*** (0.0000)	171.49*** (0.0000)	62.57*** (0.0000)	32.46*** (0.0000)
Hausman test	82.09*** (0.0000)	58.33*** (0.0000)	15.15** (0.0341)	19.76*** (0.0061)

Notes: p-value in parentheses, *significant at 10%, **significant at 5%, ***significant at 1%
Note: Ln (natural logarithm form)

The impact of market size measured as GDP constant is positive and significant at 10% in Model 1 and highly significant at 1% in Model 2. In addition, the coefficient of inflation is positive and significant at 5% in Model 2 (Ezeoha & Cattaneo, 2012). Human capital, infrastructure, and investment profile do not have any significant results. On the effects of the oil variables as a proxy for natural resources, fuel exports are seen to enhance FDI inflows in a positive and significant way, at 5% in Model 1 and at 10% in Model 2. This result is consistent with the earlier evidence from Asiedu (2006) and Mohamed & Sidiropoulos (2010). Oil rents have negative effects and are significant at 5% in both models. Oil production and oil reserves do not have any significant results. In general, across the GMM estimation method above, the estimation coefficient of the lagged inward FDI is dynamic and persistent. Moreover, trade openness, GDP constant, inflation, and fuel exports are regarded as determinants of inward FDI in MENA countries, whereas oil rents and oil production relative to oil reserves discourage FDI inflows into MENA countries.

Table 10
DEPENDENT VARIABLE: INWARD FDI PERCENTAGE OF GDP, PANEL ANALYSIS, COUNTRY FIXED-EFFECTS (MODEL BASED ON CORRELATION MATRIX). IMPACT OF OIL PRODUCTION, OIL RESERVES AND OIL RELATIVE_PRODUCTION WITH INTERACTION

Regressor	(1)	(2)	(3)	(4)	(5)	(6)
Ln TRADE	1.291 (0.210)	0.0448 (0.809)	1.029 (0.429)	0.405 (0.835)	0.887 (0.468)	0.0416 (0.840)
OIL (production)	0.001 (0.482)	-0.0009** (0.012)				
OIL (reserves)			0.019 (0.243)	-0.021 (0.208)		
OIL (relative_ production)					311.66 (0.372)	271.46 (0.365)
Ln GDP	5.902** (0.002)	5.707*** (0.005)	5.65** (0.022)	5.192*** (0.006)	5.457** (0.035)	5.255** (0.017)
INFLATION	0.083* (0.082)	0.084** (0.038)	0.085* (0.093)	0.0812** (0.037)	0.068 (0.155)	0.078** (0.029)
INFRASTRUCTURE		-0.040 (0.645)		-0.028 (0.741)		-0.054 (0.599)
HUMAN CAPITAL (Education)	-0.046 (0.225)		-0.051 (0.194)		-0.045 (0.251)	
INSTITUTION (Investment profile)	0.474 (0.145)	0.032 (0.916)	0.396 (0.203)	0.0789 (0.800)	0.236 (0.411)	0.114 (0.610)
INTERACTION3 (Investment profile*production)	-0.0003* (0.074)	-0.00004 (0.407)				
INTERACTION4 (Investment profile*reserves)			-0.007* (0.082)	-0.0004 (0.831)		
INTERACTION5 (Investment profile*relative_production)					-69.616 (0.351)	-61.39* (0.344)
CONSTANT	-144.76** (0.018)	-137.76*** (0.007)	-137.59** (0.021)	-125.87*** (0.008)	-132.49** (0.035)	-128.16** (0.017)
N. Observations	194	266	190	262	189	261

N. Countries	14	15	14	15	13	14
F test	13.30*** (0.0001)	33.17*** (0.000)	9.70*** (0.0003)	38.68*** (0.0000)	44.79*** (0.0000)	38.00*** (0.0000)
Hausman test	21.47*** (0.0031)	15.56** (0.0164)	12.26* (0.0923)	9.68 (0.2072)	15.20** (0.0188)	27.72*** (0.0001)

Notes: p-value in parentheses, *significant at 10%, **significant at 5%, ***significant at 1%
Note: Ln (natural logarithm form)

Table 11
DEPENDENT VARIABLE: INWARD FDI PERCENTAGE OF GDP, PANEL ANALYSIS, COUNTRY RANDOM-EFFECTS (MODEL BASED ON CORRELATION MATRIX). IMPACT OF OIL PRODUCTION, OIL RESERVES AND OIL RELATIVE_ PRODUCTION WITH INTERACTION

Regressor	(1)	(2)	(3)	(4)	(5)	(6)
Ln TRADE	2.305* (0.069)	1.357 (0.421)	2.089 (0.112)	1.281 (0.460)	3.656** (0.020)	2.38 (0.112)
OIL (production)	0.001 (0.574)	-0.001*** (0.007)				
OIL (reserves)			0.024 (0.418)	-0.030 (0.010)		
OIL (relative_production)					181.96 (0.506)	-48.31 (0.782)
Ln GDP	4.312*** (0.006)	3.366*** (0.000)	4.004*** (0.004)	3.053*** (0.001)	1.411*** (0.000)	0.610 (0.155)
INFLATION	0.073* (0.089)	0.084** (0.031)	0.073 (0.101)	0.0824** (0.026)	0.055 (0.169)	0.072** (0.025)
INFRASTRUCTURE		0.022 (0.767)		0.036 (0.641)		0.011 (0.867)
HUMAN CAPITAL (Education)	-0.031 (0.279)		-0.032 (0.273)		-0.009 (0.592)	
INSTITUTION (Investment profile)	0.482 (0.167)	0.205** (0.557)	0.459 (0.177)	0.231 (0.507)	0.454 (0.212)	0.385 (0.188)
INTERACTION3 (Investment profile*production)	-0.0002 (0.219)	0.00003 (0.446)				
INTERACTION4 (Investment profile*reserves)			-0.006 (0.129)	-0.0003 (0.882)		
INTERACTION5 (Investment profile*relative_production)					-55.55 (0.388)	-8.10 (0.848)
CONSTANT	-111.61*** (0.006)	-86.27** (0.002)	-52.55*** (0.004)	-78.69* (0.003)	-50.79*** (0.002)	-26.54 (0.101)
N. Observations	194	266	190	262	189	261
N. Countries	14	15	14	15	13	14
Wald Chi2	27.90*** (0.0002)	220.48*** (0.000)	52.70*** (0.0000)	144.68*** (0.0000)	100.69*** (0.0000)	432.33*** (0.0000)
Hausman test	21.47*** (0.0031)	15.56** (0.0164)	12.26* (0.0923)	9.68 (0.2072)	15.20** (0.0188)	27.72*** (0.0001)

Table 12 SYSTEM GMM, 1980-2009. DEPENDENT VARIABLE: INWARD FDI PERCENTAGE OF GDP		
	MODEL 1	**MODEL 2**
FDIIN Lag1	-0.055 (0.786)	-0.117 (0.304)
Lag2	-0.504*** (0.000)	-0.476*** (0.000)
Ln TRADE	11.693*** (0.003)	12.234*** (0.002)
Ln FUEL	0.733** (0.030)	0.666* (0.093)
OILRENTS	-0.212** (0.013)	-0.190** (0.034)
OIL (production)	0.001 (0.627)	0.001 (0.854)
OIL (reserves)	-0.009 (0.741)	-0.016 (0.484)
OIL (relative_ production)	-352.11* (0.080)	-357.11** (0.035)
LnGDP	2.084* (0.067)	2.585*** (0.006)
INFLATION	0.160 (0.118)	0.170** (0.026)
INFRASTRUCTURE		0.021 (0.692)
HUMAN CAPITAL (Education)	0.008 (0.497)	
INSTITUTION (Investment profile)	0.532 (0.114)	0.472 (0.131)
CONSTANT	-101.25** (0.021)	-114.73*** (0.003)
Number of Observation	169	221
Number of groups	12	13
Wald Chi2	3219.80*** (0.000)	16890.77*** (0.000)
A-B AR(1) test	-2.17** (0.030)	-2.28** (0.023)
A-B AR(2) test	1.62 (0.106)	1.04 (0.296)
Hansen test	0.00 (1.000)	0.00 (1.000)

Notes: This table reports dynamic panel GMM–system estimation. The AR (1) in the first differences rejects the null correlation and AR (2) accepts the null of no correlation, in Hansen statistic test for the validity of the over-identifying restrictions. In the estimation, collapse version of the instrument matrix is used, to limit the number of instruments. P-value in parentheses, *significant at 10%, **significant at 5%, ***significant at 1%
Note: Ln (natural logarithm form)

Table 13 SYSTEM GMM, 1980-2009. DEPENDENT VARIABLE: INWARD FDI PERCENTAGE OF GDP. WITH INTERACTION		
	MODEL 1	**MODEL 2**
FDIIN Lag1	0.026 (0.910)	-0.126 (0.252)
Lag2	-0.484*** (0.000)	-0.455*** (0.000)
Ln TRADE	10.260*** (0.009)	12.108*** (0.005)
Ln FUEL	1.380*** (0.000)	1.648*** (0.000)
OIL RENTS	-0.090 (0.353)	-0.216*** (0.002)
OIL (production)	-0.001 (0.743)	-0.001 (0.142)
OIL (reserves)	-0.013 (0.814)	0.039 (0.377)
OIL (relative_production)	415.44* (0.070)	273.70* (0.071)
Ln GDP	2.126* (0.057)	2.805*** (0.002)
INFLATION	0.149 (0.144)	0.166** (0.045)
INFRASTRUCTURE		0.021 (0.678)
HUMAN CAPITAL (Education)	0.016 (0.286)	
INSTITUTION (Investment profile)	0.817*** (0.003)	0.626*** (0.009)
INTERACTION1 Investment profile *Fuel	-0.170*** (0.002)	-0.179*** (0.000)
INTERACTION2 (Investment profile*Oil Rents)	-0.004 (0.725)	0.008 (0.481)
INTERACTION3 (Investment profile*production)	0.001 (0.497)	0.001** (0.036)
INTERACTION4 (Investment profile*reserves)	-0.001 (0.857)	-0.007 (0.105)
INTERACTION5 (Investmentprofile*relative_production)	-120.17** (0.031)	-99.85** (0.012)
CONSTANT	-98.06** (0.024)	-119.93*** (0.003)
Number of Observation	169	221
Number of groups	12	13
Wald Chi2	1458.73*** (0.000)	68359.35*** (0.000)
A-B AR(1) test	-2.02** (0.043)	-2.17** (0.030)
A-B AR(2) test	1.72* (0.085)	0.86 (0.393)
Hansen test	0.00 (1.000)	0.00 (1.000)

Note: This table reports dynamic panel GMM–system estimation. In the Model 1 the AR (1) and AR (2) in the first differences rejects the null of no correlation. But in Mode 2 the AR (1) in the first differences rejects the null

correlation and AR (2) accepts the null of no correlation. Hansen statistic test for the validity of the over identifying restrictions. In the estimation, collapse version of instrument matrix is used, to limit the number of instruments.
P-value in parentheses, *significant at 10%, **significant at 5%, ***significant at 1%
Note: Ln (natural logarithm form).

GMM RESULTS WITH INTERACTION

Table 13 reported the results involving the interaction term into the regression. The estimates are run by system GMM estimator for Equation 15. In Model 1, the Hansen over-identification test shows the validity of the instruments used in the estimations although the value is equal to 1.00, which is an indication of high instruments. The test for the first- and second-order residual autocorrelation AR (1) and AR (2) errors in Model 2 indicates that we reject the null hypothesis of no evidence in the first-order serial correlation and second-order correlation. In Model 2, the Hansen over-identification test is satisfactory and does not reject the null hypothesis that instruments are valid. The test for the first- and second-order residual autocorrelation in the first model estimators AR (1) and AR (2) errors indicated that the null hypothesis of no evidence of serial correlation in the first-order residual should be rejected, but we can accept the null hypothesis in the second-order residual.

Some interactive terms were tested between oil as a proxy for natural resources and investment profile as an institutional quality in the dynamic system GMM regression, and the results are shown in Table 13. Starting with the dependent variable, the coefficient of the second lag of the dependent variable IFDI is negative (Boubakri et al., 2013) and statistically significant at 1% in all the models, a confirmation that the persistence of IFDI has been made (Asiedu et al., 2009). This suggests that current inward FDI is negatively correlated with future inward FDI (Asiedu & Lien, 2011). Furthermore, the choice of dynamic GMM as a preferred panel estimator is confirmed by the data, suggesting that the results have good statistical properties. The lagged dependent variable is instrumented using their lagged valued in the differenced equation and their once lagged first differences in the level equation.

Comparing the fixed-effect and random-effect estimates (Tables 4-11) and the estimates using the system GMM estimator (Tables 12 and 13), it can be concluded that the system GMM estimator is a more appropriate and consistent estimator. Despite the importance of natural resources as location determinants or in the new theory of trade, MENA countries still retain abundant natural resources (such as oil) that are off-limits to foreign investors. It is the main novelty of the results, where the two different patterns in MENA countries, which served to approve the location dimension of the OLI paradigm. The results implied that MENA countries benefit from the location dimension and from the new theory trade dimension such as market size and trade, with FDI being complementary. In contrast, rejecting the new theory trade dimension such as natural resources in MENA countries is not supported.

CONCLUSION

This study looked at the empirical determinants of foreign direct investment (FDI), using panel data from 17 MENA countries over the period 1960-2012. Fixed effects and random effects were generalized using a least-squares estimation technique. In addition, the dynamic system GMM estimations was performed to account for endogeneity and country-specific effects. The methodology by Mina (2007a,b) was followed for modeling GCC countries. The main findings indicated that different types of natural resources have different effects on FDI in

MENA countries. For instance, fuel exports attract FDI to them, but measures of natural resources such as oil rents, oil production, and oil reserves, and oil production relative to oil reserves discouraged FDI inflows. It means that natural resources are not always resource-seeking as Dunning (1981) or the new theory of trade predicted. Moreover, applying "Dutch disease" and "resource curse" to FDI in the MENA region is the hypothesis that a country's energy endowment is negatively associated with FDI.

The interaction term between natural resources and investment profile found that the effects of investment profile on FDI are dependent upon the type of natural resource. The interaction between fuel exports and oil production relative to oil reserves had a negative effect on inward FDI. It supported the view that fuel exports and oil relative production reduced the effectiveness of the investment profile in promoting FDI inflows. By contrast, the interaction between oil production and investment profile had a positive effect on FDI inflows. Such a result indicates that perhaps oil production depends on institutional quality in MENA countries. It could be interesting to combine the two main results, checking which effects are predominant. Furthermore, this analysis highlighted the importance of oil as a proxy for natural resources and the location determinants of FDI into MENA countries. In future, an attractive research proposal could be beneficial to apply these results specifically to different types of location determinants of FDI inflows. Future research is significantly necessary to improvise the outcomes on a broad spectrum. The FDI in respect to the MENA countries can be assessed on the investment profile of various sectors, which will be significant to develop more comprehensive results. In the past years, such knowledge was limited as per the previous literature; however, this study has uniquely contributed in retrieving outcomes related to FDI. Thus, such thematic perspectives can be brought forward to get reasonable results effectively.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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