DETERMINANTS OF EGYPTIAN ARAB INTER-INVESTMENTS:
GRAVITY MODEL EVIDENCE

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ABSTRACT

Keywords

Egyptian Arab inter-investments, Gravity Model

The research uses the gravity model to assess the flows of investments between Egypt and Arab countries and identifies the most important factors influencing them by using the time series data regression. Results revealed that the growth of Egyptian FDI outflows to Arab countries is expected to be influenced by Egypt and Arab countries' GDP, Per capita GDP for Arab countries and distance. Improving indicators such as Corruption perception, Business environment, Investment attractiveness, Infrastructure, and Market size in Arab countries is considered very crucial for the development of Egypt's FDI outflows to Arab countries. On the other hand, Egypt and Arab countries' GDP, distance, and Egypt's population are expected to influence Egypt's FDI inflows from Arab countries, while indicators such as Competitiveness, Corruption perception, Political stability, Business environment, Investment attractiveness, and Market size are seen to be very important for Egypt to consider for attracting FDI inflows from Arab countries.

MISIRLI ARAP YATIRIMLARI: YERÇEKİMİ MODELİ

ÖZ

Anahtar kelimeler

Mısırlı Arap Yatırımları, Yerçekimi Modeli

Bu çalışmada Mısır ve Arap ülkeleri arasındaki yatırım akışlarını değerlendirmek ve zaman serisi veri regresyonunu kullanarak bunları etkileyen en önemli faktörleri belirlemek için yerçekimi modeli kullanılmaktadır. Sonuçlar, Mısır'dan Arap ülkelerine yapılan Doğrudan yabancı yatırım (DYY) çıkışlarının artmasının Mısır ve Arap ülkelerinin Gayrisafi yurtiçi hasılasından (GSYİH), Arap ülkeleri için kişi başına GSYİH'sından ve mesafeden etkilendiğini ortaya çıkarmaktadır. Arap ülkelerinde Yolsuzluk algısı, İş ortamı, Yatırım çekiciliği, Altyapı ve Pazar büyüklüğü gibi göstergelerin iyileştirilmesi, Mısır'ın Arap ülkelerine yönelik DYY çıkışlarının gelişmesi için çok önemli kabul edilmektedir. Öte yandan, Mısır ve Arap ülkelerinin GSYİH, mesafe ve Mısır'ın nüfusunun Mısır'ın Arap ülkelerinden gelen doğrudan yabancı yatırım girişlerini etkilemesi beklenmektedir. Rekabetçilik, Yolsuzluk algısı, Siyasi istikrar, İş ortamı, Yatırım çekiciliği ve Pazar büyüklüğü gibi göstergelerin Mısır'ın Arap ülkelerinden doğrudan yabancı yatırımları çekmesi açısından çok önemli olduğu görülmektedir.

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1. INTRODUCTION

Arab countries face significant development challenges that have contributed to high unemployment and volatile economic growth, where most of these countries implement reform policies that aim at accelerating growth, diversifying the economy and consolidating the export base by promoting more domestic and foreign private investment (Laabas and Abdmoulah, 2009). Arab countries need more investment flows to stimulate economic growth, create more jobs and reduce poverty, as well as the urgent need for modern technology.

In spite of many amendments to the laws and legislation in most Arab countries to encourage and attract foreign investment, Arab countries have not been successful in becoming important attractions for foreign direct investment compared to other developing countries. Intra-Arab investments are still facing many constraints which naturally limit the flow of funds between these countries; including the existence of structural imbalances of a regional and local nature, coupled with the weakness of the economies of the Arab countries in general and the weakness of the productive base in particular (Naggar, 1989). Data confirms the small share of the Arab region in FDI inflows, with total inflows amounting to 63.61 billion dollars during the period 2010-2017, accounting for 6% of the share of developing countries and about 2.88% of total FDI flows of the world.

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Despite the efforts taken by the Arab countries to attract and encourage Arab intra-Arab investment flows, still its volume remains insufficient and below expectations (Mohammed, 2003), which made intra-Arab investments inevitable, especially with the existence of similar background of civilization, common language, spatial convergence, intellectual and cultural similarity, and religious ties.

As for Egypt, Arab investments are one of the important targets of the Egyptian economy; however, the non-Arab foreign component is still the largest in Egypt over the past years. Arab investments are characterized by their weak presence in Egypt and the Arab region, and their great focus in USA and Europe, while Egypt and the Arab region suffers from a severe shortage of investments that could help to reduce poverty levels and unemployment in Arab societies.

This paper tries to understand what motives Egyptian Arab inter-investments, it uses the gravity model approach to assess the flows of investments between Egypt and Arab

countries and identifies the most important factors that influencing them. There are many studies in Egypt that have dealt with intra-Egyptian Arab trade, where the gravity model was used to determine the most important factors affecting it, while this study is the first to use this model in measuring the determinants of inter-investments between Egyptian and Arab countries.

The gravity model was introduced firstly in economics by Tinbergen (1962) and Linnemann (1966); the model takes its name from Newton's law of gravity, which is due to the attraction of two bodies to their mass and negatively to the distance between them (Shelaby et al., 2018).

The model is widely used to evaluate the determinants of bilateral trade and investment. An early application of the gravity model to FDI was done by Eaton and Tamura (1994), they found that distance elasticity has a negative sign thus FDI relationship is much stronger with countries that are nearby. Coval and Moskowitz (1999) indicated that geographical distance is an important element in international portfolio allocation decisions and it is the right concept for explaining investment bias.

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Ghosh and Wolf (1999) indicated that trading relationships as well as short run financial relationships create long run supply and demand channels through which domestic enterprises can acquire foreign capital. Some empirical studies generally showed that GDP and GDP per capita have a positive impact on inflow FDI. Others illustrated that competitiveness indicators such as corruption is negatively and significantly related to FDI (Egger and Winner, 2006) and Wei, 2000), while infrastructure was found more important than market size in developing countries for FDI attraction (Wheeler and Mody, 1992). Globerman and Shapiro (2002) and Haussmann and Fernandez (2000) indicated that high quality institutions have positive effects on both inflows and outflows FDI.

Khanna and Palepu (2000) claimed that the absence of developed institutions makes it difficult for developing economies to become attractive for foreign investments, while Quazi (2007) and Zghidi et al. (2016) found that economic freedom is an important element for economic progression, it is an indicator of the domestic investment climate and it attracts significant foreign investment. Furthermore, large market size, higher return on capital and greater information about the location where investment will be allocated will improve the flow of foreign direct investment.

Market-supporting and investment friendly institutional environment also facilitates foreign investments by reducing unnecessary obstacles in commercial operations and maintaining such activities in host countries (Wei, 2000). Foreman (2007) illustrated that reducing government intervention, increasing property rights protections and lowering barriers to capital flows are likely to raise FDI. Similarly, Bengoa and Robles (2003) found that economic freedom in the host country has a positive impact on FDI.

Dima (2008) illustrated that a higher level of the components of economic freedoms (mainly security of property rights) tends to be associated with a better capacity of the host countries to attract foreign direct investment. While, Hassan (2015) found that the countries with lower tax charge, corruption-free operating environment and business friendly regulation take advantage of a positive influence on international relocation decision of the investors.

The literature highlights many factors that determining foreign direct investment, however, along with other determinants, this study will investigate the factors that determines inter-investments between Egyptian and Arab.

2. THE FLOW OF INVESTMENTS BETWEEN EGYPT AND ARAB COUNTRIES:

Arab countries have multinational companies as well as foreigners since decades, however before the 1970s, some Arab countries followed restrictive regulatory policies, which were not very hospitable to foreign investments (SRC-AUC). Arab countries come far behind Europe, America and Asia, the Arab region as a whole has only attracted 2.88% of total FDI flows of the world during the period 2010-2017, it is a modest amount comparing to the share of developing countries as a whole.

This situation is not different in the investment relations between Egypt and the Arab countries, as the volume of Egyptian Arab inter-investments remains relatively small compared to their investments with the outside world.

As table (1) indicates, the value of Egypt's FDI inflows from Arab countries was increasing during the period (2000-2018). It ranges from a minimum of about 1557.8 Million dollars in 2001 to a maximum of about 6059 Million dollars in 2010 with an average of 3747 Million dollars during the period (2000-2018).

Table 1: Egypt's FDI inflows from Arab Countries   (Million Dollars)

Year Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average
Jordan	44.4	33.3	55.5	61.05	50.5	66.6	72.7	77.7	83.8	88.8	111	50.6	45.7	72.5	66.4	94.35	101	123	99	73.6
UAE	591.2	443.4	739	812.9	672.4	886.8	968	1034	1115	1182	1478	73.9	80.9	366.6	685.3	1056	1146	1440	1599	861.6
Bahrain	48.4	29.3	59.5	71.55	49.05	69.6	80.2	79.7	91.35	100.8	119	49.1	51.8	79.1	69.47	99.8	110	134	111	79.1
Tunisia	51.4	36.3	60.5	66.55	55.05	72.6	79.2	84.7	89.35	96.8	121	55.1	49.8	79.1	72.47	102.8	110	134	129	81.4
Algeria	63.6	47.7	79.5	87.45	72.3	95.4	104	111.3	120	127.2	159	72.5	65.5	103.9	95.2	135.1	144	176	181	107.4
Saudi Arabia	512.4	509.3	715.5	867	669.1	918.6	975	921.7	978.4	1024	1531	170.1	124.7	374.2	717.5	976.3	1332	1444	1665	864.5
Sudan	63.2	47.4	79	86.9	71.8	94.8	103	110.6	119	126.4	158	72	65	103.3	94.6	134.3	143	175	188	107.1
Syria	63.6	47.7	79.5	87.4	72.3	95.4	104	111.3	120	127.2	159	72.5	65.5	103.9	95.2	235.1	344	376	299	139.9
Iraq	33.2	24.9	41.5	45.6	37.7	49.8	54.3	58.1	62.6	66.4	83	37.8	34.1	54.2	49.7	70.5	75	92	100	56.3
Oman	52	39	65	71.5	59.1	78	85.1	91	98.1	104	130	59.28	53.5	85.02	77.8	110.5	118	144	99	85.3
Palestine	59.6	44.7	74.5	81.9	67.7	89.4	97.5	104	112	119	149	67.9	61.38	97.4	89.2	126.6	135	165	147	99.4
Qatar	250	187	312	343	284	375	409	437	471	400	425	585	557	208	274	131	109	103	123	314.9
Kuwait	300	350	550	525	582	600	683	789	879	999	987	104	118	281	399	675	667	687	654	569.9
Lebanon	44.4	33.3	55.5	61	50.5	66.6	72.7	77.7	83.8	88.8	111	50.6	45.7	72.5	66.4	94	101	123	147	76.1
Libya	40.4	30.3	50.5	55.5	45.9	60.6	66.1	70.7	76.2	80.8	101	46	41.6	66	60	85.8	92	112	159	70.5
Somalia	37	33	25	41	33	42	51	44	55	45	65	33	23	55	44	55	66	59	78	46.5
Morocco	37.2	27.9	46.5	51.1	42.3	55.8	60.9	65.1	70.2	74.4	93	42.4	38.3	60.8	55.7	79	84	103	123	63.7
Yemen	27.6	23.2	52	39.2	35.5	46.4	44.3	55	52	65	63	32.6	39.3	44.1	46.2	66	71	99	69	51.1
Total	2312.6	1974.7	3135.5	3454.6	2947.2	3761.4	4109	4323.6	4677.8	4920.6	6059	1674.4	1558	2302	3054	4328	4942	5690	5970	3747

Source: The Arab Investment & Export Credit Guarantee Corporation.

Table 2: Egypt's FDI outflows to Arab Countries   (Million Dollars)

Year / Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average
Jordan	41.2	30.9	51.5	56.65	46.8	61.8	67.4	72.1	77.7	82.4	103	46.9	42.4	67.3	61.6	87.5	93.8	114	99	68.6
UAE	182.8	137.1	228.5	251.3	207.9	274.2	299.3	319.9	345	365	457	208.3	188.2	298	273	388	416	507	499	307.7
Bahrain	18	13.5	22.5	24.75	20.4	27	29.4	31.5	33.9	36	45	20.5	18.54	29.4	26.9	38.25	40.9	49.9	55	30.6
Tunisia	23.2	17.4	29	31.9	26.39	34.8	37.99	40.6	43.7	46.4	58	6.4	13.8	27.9	24.7	39.3	42.8	54.3	66	35
Algeria	42	31.5	52.5	57.7	47.77	63	68.7	73.5	79.2	84	105	47.8	43.26	68.6	62.8	89.2	95.6	116	147	72.4
Saudi Arabia	163.6	122.7	204.5	224	186	245	267	286	308	327	409	186	168	267	244	347	372	453	521	279
Sudan	121.6	91.2	152	167.2	138	182.4	199	212.8	229	243	304	138.6	125.2	198	182	258	276	337	333	204.6
Syria	24.4	20.8	28	29.8	26.38	31.6	33.58	45.2	47.1	48.8	36	46.41	14.83	13.5	11.5	10.6	12.7	11.9	22	27.1
Iraq	5.6	4.2	7	7.7	6.37	8.4	19.17	19.8	10.5	31.2	34	36.3	35.7	39.1	38.3	31.9	32.7	35.5	44	23.5
Oman	10	7.5	12.5	13.75	11.37	15	16.37	17.5	18.8	20	25	11.4	10.3	16.3	14.9	21.2	22.7	27.7	33	17.1
Palestine	43.2	32.4	54	59.4	49.14	64.8	70.74	75.6	81.5	86.4	108	49.24	44.49	70	64.6	91.8	98.3	119	99	71.7
Qatar	42.4	31.8	53	58.3	48.23	63.6	69.43	74.2	80	84.8	106	48.3	43.6	69.3	63.4	90.1	96.5	117	123	71.7
Kuwait	12.8	9.6	16	17.6	14.56	19.2	20.96	22.4	24.1	25.6	32	14.5	13.18	20.9	19.1	27.2	29.1	35.5	44	22
Lebanon	5.6	4.2	7	7.7	6.37	8.4	9.17	9.8	10.5	11.2	14	6.38	5.76	9.15	8.38	11.9	12.7	15.5	22	9.8
Libya	43.6	32.7	54.5	59.95	49.59	65.4	71.39	76.3	82.2	87.2	109	49.70	44.90	71.2	65.2	92.6	99.2	120	132	74
Morocco	43.6	32.7	54.5	59.95	49.59	65.4	71.39	76.3	82.2	87.2	109	49.7	44.9	71.2	65.2	92.6	99.2	120	123	73.6
Yemen	41.2	30.9	51.5	56.65	46.8	61.8	67.46	72.1	77.7	82.4	103	46.9	42.43	67.3	21.6	37.55	23.8	15.3	25	51.1
Somalia	46	39	59	49	47	59	71	79	81	99	89	62	55	78	89	99	99	45	33	67.3
Total	910.8	690.1	1137	1233	1028	1350	1489	1604	1712	1847	2246	1075	954	1482	1336	1853	1963	2293	2420	1506.5

Source: The Arab Investment & Export Credit Guarantee Corporation.

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Saudi Arabia comes first in terms of FDI value in Egypt with an average of about 864.5 Million dollars, while the United Arab of Emirates ranked second in terms of FDI value in Egypt with an average of about 861.6 Million dollars, then Kuwait ranked third with an average of about 569.9 Million dollars.

As table (2) shows, the value of Egypt's FDI outflows to Arab countries were steadily increasing during the period (2000-2018). It ranges from a minimum of about 690.1 Million dollars in 2001 to a maximum of about 2420 Million dollars in 2018 with an average of 1506.5 Million dollars during the period (2000-2018). The United Arab of Emirates ranked first in terms of receiving Egypt's FDI outflows with an average value of about 307.7 Million dollars, followed by Sudan with an average value of about 204.6 Million dollars of Egypt's FDI outflows.

3. MATERIALS AND METHODS

3.1. Model Specification

Gravity Model is estimated using the time series data regression. The gravity model relies upon Newton's theory of gravity where the attractive force between two objects is positively related with their masses and negatively related to the square of distance (Anderson, 2003, 2016). In light of Newton's theory of gravity, a similar functional relation that explains the flow of international trade can be proposed as the following (Tinbergen, 1962):

$$F_{ij} = G \, M_i{}^\alpha \, M_j{}^\beta \, / \, D_{ij}{}^\theta \tag{1}$$

Where,

F_{ij}: Volume of trade between two countries i and j.

$M_i(_j)$: Relevant economic size of country i(j).

D_{ij}: Distance between the countries i and j.

The flow of trade between two countries is positively related to the GDP of two countries and negatively related to the geographical distance between capital of those two countries or major cities. The model can be expressed using the following exponential equation:

$$Y_{ij} = \beta 0 \, GDP_i\beta 1 \, GDP_j\beta 2 \, Dist_{ij}-\beta 3 \tag{2}$$

Where,

Yij: Volume of trade between two countries.

GDPi and GDPj: Gross Domestic Product of the countries i and j.

Distij: Distance between the countries i and j.

This exponential equation can be converted into a function. By taking the logarithm of the two sides, it can be converted into a double logarithmic function as shown in equation (2)

$$\ln Y_{ij} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j - \beta_3 \ln Dist_{ij} + \pounds_{ij} \qquad (3)$$

Where £ ij represents the random error.

This equation is called the Basic Gravity Model (BGM). The combinations of macroeconomic variables, such as GDP, population and geographic distance, are powerful predictors of trade and investment potentials. Hence, gravity equations use these variables on international trade and FDI (Bayoumi et al, 2007). The population variable of the two countries within the model is added into the equation (3) and it is called the Augmented Gravity Model (AGM) as follows:

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$$\ln Y_{ij} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln Pc_i + \beta_4 \ln Pc_j - \beta_5 \ln Dist_{ij} + \pounds_{ij} \qquad (4)$$

In this paper, beside the Basic Gravity Model (BGM) and the Augmented Gravity Model (AGM), variables to be used such as GDP growth, Integrity index, Economic freedom index, Competitiveness index, Corruption perception index, Logistics Performance index, Political stability index, Financial liaison index, Business environment index, Investment attractiveness index, Infrastructure index and Market size. So the equation will be as follows:

$$\ln Y_{ij} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln Pc_i + \beta_4 \ln Pc_j - \beta_5 \ln Dist_{ij} + \beta_6 \ln pop_i + \beta_7 \ln pop_j + \beta_8 \ln GDP\ growth_i + \beta_9 \ln GDP\ growth_j + \beta_{10} \ln Intg_i + \beta_{11} \ln Intg_j + \beta_{12} \ln EcoF_i + \beta_{13} \ln EcoF_j + \beta_{14} \ln comp_i + \beta_{15} \ln comp_j + \beta_{16} \ln Corr_i + \beta_{17} \ln Corr_j + \beta_{18} \ln Logis_i + \beta_{19} \ln Logis_j + \beta_{20} \ln Poli_i + \beta_{21} \ln Poli_j + \beta_{22} \ln Fin_i + \beta_{23} \ln Fin_j + \beta_{24} \ln Bus_i + \beta_{25} \ln Bus_j + \beta_{26} \ln Inv_i + \beta_{27} \ln Inv_j + \beta_{28} \ln Infra_i + \beta_{29} \ln Infra_j + \beta_{30} \ln Mark_i + \beta_{31} \ln Mark_j + \pounds_{ij} \qquad (5)$$

Where,

i: Egypt

j: Arab countries

Y_{ij}: Investment exchange whether outflows or inflows between country i and country j.

GDP_i and GDP_j: GDP of countries i and j.

Pc_i and Pc_j: Per capita GDP of countries i and j.

$Dist_{ij}$: Geographical distance between the capitals of two countries.

Pop_i and $_j$: Population of countries i and j.

GDP growth i and j: GDP growth of countries i and j.

$Intg_i$ and $_j$: Integrity index of countries i and j.

$EcoF_i$ and $_j$: Economic Freedom index of countries i and j.

$Comp_i$ and $_j$: Competitiveness index of countries i and j.

$Corr_i$ and $_j$: Corruption perception index of countries i and j.

$Logis_i$ and $_j$: Logistics performance index of countries i and j.

$Poli_i$ and $_j$: Political stability index of countries i and j.

Fin_i and $_j$: Financial liaison index of countries i and j.

Bus_i and $_j$: Business environment index of countries i and j.

Inv_i and $_j$: Investment attractiveness index of countries i and j.

$Infra_i$ and $_j$: Infrastructure index of countries i and j.

$Mark_i$ and $_j$: Market size index of countries i and j.

$£_{ij}$: Random error.

$B_{0, 1, 2, n}$: Constants of proportionality.

Ln: natural logarithm.

The Stepwise Regression method was used to determine the most significant variables.

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3.2. Variables Included In The Model

The data included in the model are time series from 2000 to 2018. Data for total investment outflows and inflows were obtained from the Arab Investment & Export Credit Guarantee Corporation (DHAMAN). Data for GDP, per capita GDP, population and GDP growth were obtained from World Development Indicators database (WDI) developed by the World Bank. Data for Competitiveness indicators were obtained from (WDI) and (DHAMAN).

4. FINDINGS

Data for the variables included in the model has been processed four times and generated four gravity models. The first one is estimated on the basis of Egypt as an exporting country of investment (FDI outflows) towards the 15 Arab countries partners (Syria, Iraq and Somalia were excluded from the model due to lack of data on investment, GDP and Competitiveness indicators), where it is consisted of the Basic Gravity Model (BGM) and the Augmented Gravity Model (AGM). The other one is estimated on the basis of Egypt as an importing country of investment (FDI inflows) from the same Arab countries, where also it is consisted of the (BGM) and the (AGM). The model includes the GDP variables of Egypt and Arab countries, the geographical distance between Egypt and each of Arab countries, the population, per capita GDP, GDP growth of Egypt and Arab countries and some Competitive indicators namely Integrity index, Economic freedom index, Competitiveness index, Corruption perception index, Logistics Performance index, Political stability index, Financial liaison index, Business environment index, Investment attractiveness index, Infrastructure index and Market size.

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4.1. Fdi Outflows' Model

4.1.1. Basic Gravity Model (BGM)

It is indicated form the results of table (3) that the most significant variables affecting Egypt's FDI outflows to the Arab countries are Egypt's and Arab countries' GDP and geographical distance between Egypt and these countries. The results indicate that the increase of GDP_i in Egypt by 10% leads to a decrease of 2.6% in Egypt's FDI outflows to the Arab countries, this inverse relationship between GDP and Egyptian foreign investments can be explained by the fact that increasing the Egyptian GDP leads to an

improvement in the Egyptian environment where it becomes more attractive for investment, therefore, the Egyptian investor will prefer domestic investment in Egypt to benefit from these positive indicators and will avoid the risks of foreign investment and its high cost. The increase of GDP_j for Arab countries by 10% leads to an increase of 5.2% in Egypt's FDI outflows to these countries. The results also showed that the increase in geographical distance ($Dist_{ij}$) between Egypt and these countries by 10% leads to a decrease of Egypt's FDI outflows by 2.4%. The significant variables explain about 19.7% of the changes occurring in Egypt's FDI outflows as the R^2 of the model is 0.197, and the model is statistically significant at a significant level of 0.01 according to F test.

4.1.2. Augmented Gravity Model (AGM)

As it is shown in Table (3), the most significant variables affecting Egypt's FDI outflows to the Arab countries are Arab countries' Per Capita GDP, Corruption perception in Arab countries, Business environment of Arab countries, Investment attractiveness of Arab countries, Infrastructure of Arab countries and Market size of these countries. Where the rest of the variables included in the module were non-significant. The results indicate that the increase of Per capita GDP_j for Arab countries by 10% leads to an increase of 11% in Egypt's FDI outflows to these countries, the increase of Corruption Perception Index Value for Arab countries by 10% leads to an increase of 14.8% in Egypt's FDI outflows to these countries, the increase of Business Environment Index Value for Arab countries by 10% leads to an increase of 29.7% in Egypt's FDI outflows to these countries, the increase of Investment attractiveness Index Value for Arab countries by 10% leads to an increase of 12% in Egypt's FDI outflows to these countries, the increase of Infrastructure Index Value for Arab countries by 10% leads to an increase of 13.5% in Egypt's FDI outflows to these countries, and the increase of Market size Index Value for Arab countries by 10% leads to an increase of 12% in Egypt's FDI outflows to the Arab countries. The significant variables explain about 76.6% of the changes occurring in Egyptian FDI outflows as the R^2 of the model is 0.766, and the model is statistically significant at a significant level of 0.01 according to F test.

Table 3: Estimated Results of Egypt's FDI outflows' Gravity Model

Variables	FDI outflows' Gravity Model	
	Basic Gravity Model	**Augmented Gravity Model**
Equation	$\ln y_i = 3.17 - 0.26 \ln GDP_i + 0.52 \ln GDP_j - 0.24 \ln Dist_{ij}$	$\ln y_i = -10.4 + 0.16 \ln pop_j + 1.1 \ln y_j\,pc + 0.48 \ln Dist_{ij} + 0.1 \ln GDP\,growth_j + 0.85 \ln Intg_j + 0.73 \ln EcoF_j + 0.12 \ln comp_j + 1.48 \ln Corr_j + 0.13 \ln Logis_j + 0.01 \ln Poli_j + 0.57 \ln Fin_j + 2.97 \ln Bus_j + 1.2 \ln Inv_j + 1.35 \ln Infra_j + 1.2 \ln Mark_j$
GDP_i	- 0.26 T= (-2.1)*	-
GDP_j	0.52 T= (8)**	-
$Distance_{ij}$	- 0.24 T= (-2.2)*	0.48 T= (1.37)
Pop_j	-	0.16 T= (0.82)
Per capita GDP_j	-	1.1 T= (2.96)*
GDP growth$_j$	-	0.1 T=(1.6)
Integrity$_j$	-	0.85 T=(0.67)
Economic freedom$_j$	-	0.73 T=(0.85)
Competitiveness$_j$	-	0.12 T=(0.55)
Corruption perception$_j$	-	1.48 T= (2.56)**
Logistics Performance$_j$	-	0.13 T= (0.17)
Political stability$_j$	-	0.01 T= (0.1)
Financial liaison$_j$	-	0.57 T= (1.8)
Business environment$_j$	-	2.97 T= (3.64)**
Investment attractiveness$_j$	-	1.2 T= (1.96)*
Infrastructure$_j$	-	1.35 T= (3)**
Market size$_j$	-	1.2 T= (2.4)*
R^2	0.197	0.766
F	(24.3)**	(53.5)**
N	285	285

Source: Results obtained through processing of data using SPSS 25

4.2. FDI Inflows' Model
4.2.1. Basic Gravity Model (BGM)

The results in Table (4) show that the factors affecting Egypt's FDI inflows from the Arab countries are Egypt's and Arab countries' GDP and geographical distance between Egypt and these countries. The results indicate that the increase of GDP_i in Egypt by 10% leads to an increase of 1.2% in Egypt's FDI inflows from the Arab countries. The increase of GDP_j for Arab countries by 10% leads to an increase of 5.8% in Egypt's FDI inflows from

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these countries. The results showed also that the increase of geographical distance ($Dist_{ij}$) between Egypt and these countries by 10% leads to a decrease of Egypt's FDI inflows by 2.7%. The significant variables explain about 59% of the changes occurring in Egyptian FDI inflows as the R^2 of the model is 0.59, and the model is statistically significant at 0.01 level according to F test.

Table 4: Estimated Results of Egypt's FDI inflows' Gravity Model

Variables	FDI inflows' Gravity Model	
	Basic Gravity Model	**Augmented Gravity Model**
Equation	$\ln y_j = -10.5 + 0.12 \ln GDP_i + 0.58 \ln GDP_j - 0.27 \ln dist_{ij}$	$\ln y_j = 19 + 1.66 \ln pop_i + 0.16 \ln y_i\, pc - 0.23 \ln Dist_{ij} + 0.83 \ln GDP\ growth_i + 0.29 \ln Intg_i + 0.83 \ln EcoF_i + 0.32 \ln comp_i + 4 \ln Corr_i + 0.04 \ln Logis_i + 0.66 \ln Poli_i + 2.4 \ln Fin_i + 1.2 \ln Bus_i + 0.8 \ln Inv_i + 2 \ln Infra_i + 0.21 \ln Mark_i$
GDP$_i$	0.12 T= (3)**	-
GDP$_j$	0.58 T= (7)**	-
Distance$_{ij}$	- 0.27 T= (-3.1)**	-0.23 T= (-3.4)*
Pop$_i$	-	1.66 T= (3.1)*
Per capita GDP$_i$	-	0.16 T= (2.4)
GDP growth$_i$	-	0.83 T=(1.2)
Integrity$_i$	-	0.29 T=(3.26)
Economic freedom$_i$	-	0.83 T=(0.41)
Competitiveness$_i$	-	0.32 T=(3.2)*
Corruption perception$_i$	-	4 T= (3.4)*
Logistics Performance$_i$	-	0.04 T= (0.2)
Political stability$_i$	-	0.66 T= (2.45)*
Financial liaison$_i$	-	2.7 T= (1.17)
Business environment$_i$	-	1.2 T= (3.7)*
Investment attractiveness$_i$	-	0.8 T= (2.45)*
Infrastructure$_i$	-	2 T= (1.63)
Market size$_i$	-	0.21 T= (3.1)*
R2	0.50	0.69
F	(96.3)**	(79.3)**
N	285	285

Source: Results obtained through processing of data using SPSS 25

4.2.2. Augmented Gravity Model (AGM)

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As it is shown in Table (4), the factors affecting Egypt's FDI inflows from the Arab countries are the geographical distance between Egypt and the Arab countries, the population of Egypt, Competitiveness of Egypt, Corruption perception of Egypt, Political stability in Egypt, Business environment in Egypt, Investment attractiveness in Egypt, and Market size in Egypt. The rest of the variables entered in the model were non-significant. The results show that the increase in geographical distance (Distij) between Egypt and Arab countries by 10% leads to a decrease of Egypt's FDI inflows by 2.3%, the increase in Egypt's population by 10% leads to an increase of Egypt's FDI inflows from Arab countries by 16.6%, the increase of Competitiveness Index Value for Egypt by 10% leads to an increase of 3.2% in Egypt's FDI inflows from Arab countries, the increase of Corruption Perception Index Value for Egypt by 10% leads to an increase of 40% in Egypt's FDI inflows from Arab countries, the increase of Political Stability Index Value for Egypt by 10% leads to an increase of 6.6% in Egypt's FDI inflows from Arab countries. The increase of Business environment Index Value for Egypt by 10% leads to an increase of 12% in Egypt's FDI inflows from Arab countries, the increase of Investment attractiveness Index Value for Egypt by 10% leads to an increase of 8% in Egypt's FDI inflows from Arab countries, and the increase of Market Size Index Value in Egypt by 10% leads to an increase of 2.1% in Egypt's FDI inflows from Arab countries. The significant variables explain about 69% of the changes occurring in Egyptian FDI inflows as the R^2 of the model is 0.69, and the model is statistically significant at 0.01 levels according to F test.

5. DISCUSSION

This study reveals that the growth of Egyptian FDI outflows to Arab countries is expected to be influenced by both Egypt and Arab countries' GDP, the value of the coefficient on log of Egypt's GDP_i (- 0.26), while it is (0.52) for Arab countries' GDP_j. The inverse relationship between Egypt's GDP and Egyptian foreign investments can be explained by the fact that the increase in the Egyptian GDP will lead to an improvement in the Egyptian business environment where it becomes more attractive for the Egyptian investors who will prefer to domestically invest in Egypt to benefit from these positive indicators and to avoid the risks of foreign investment and its high cost. On the other hand, the positive relationship between GDP of Arab countries and Egyptian

foreign investments to these countries indicates that there's a great chance for Egypt to increase the FDI outflows to Arab countries as the GDP for these countries increases.

Distance between Egypt and Arab countries has a negative sign for the coefficient on log of Dist$_{ij}$ in both FDI outflows basic gravity model and FDI inflows' basic and augmented gravity model, which can be interpreted that the near the Arab countries to Egypt, the more the Egyptian FDI outflows and inflows. However, distance is not significantly affect the augmented model of FDI outflows and has a positive sign where this can be interpreted that Egypt has positive and negative policies with some Arab countries that have made the distance a variable that does not affect the models.

The increase in Egypt's population leads to an increase of FDI inflows from Arab countries to Egypt which indicate how huge the Egyptian market is to absorb more Arab investments. On the other hand, the increase of Per capita GDP for Arab countries will lead to more increase in Egypt's FDI outflows to these countries.

Improving indicators such as Corruption perception, Business environment, Investment attractiveness, Infrastructure, and Market size in Arab countries is considered very crucial for the development of Egypt's FDI outflows to Arab countries. In other words, Arab countries with less corruption, good infrastructure and business environment, and big market size will attract Egypt's FDI outflows more.

Indicators such as Competitiveness, Corruption perception, Political stability, Business environment, Investment attractiveness, and Market size are considered very crucial for Egypt to work on to attract FDI inflows from Arab countries (Nasser, 2018). In other words, Egypt has to improve more its Business environment, achieve more political stability and work to fight corruption to attract more Arab FDI.

6. CONCLUSİON

There are many positive factors that the Egyptian decision-maker can take care of in order to increase the investment attractiveness of Egypt, but those indicators are divided into two parts. The first part requires long-term and costly national plans such as (increasing GDP, market size, and improving the infrastructure), while the second part needs short-term plans to be achieved such as improving indicators of Competitiveness, Corruption perception, Political stability, Business environment, and

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Investment attractiveness. Therefore, the Egyptian decision-makers should turn their policies towards short-term plans, which results appear fast and will have a positive impact on attracting more Arab investments, along with long-term plans.

There is no doubt that encouraging investment between Egypt and the Arab countries needs to remove many obstacles such as corruption, red tape, lack of infrastructure, lack of information, and the multiplicity of investment supervising bodies. As well as there is a necessity for the Arab countries to implement the unified agreement for investing Arab capital, providing additional incentives for investment projects, providing comprehensive and accurate information and data related to the investment process, a proper implementation of laws and achieving the effectiveness of institutions in order to encourage and attract investments, and developing Arab financial markets and linking them with each other.

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