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THE IMPACT OF FOREIGN CAPITAL INFLOWS
ON ECONOMIC GROWTH AND EMPLOYMENT
IN EGYPT: A SECTORAL EMPIRICAL ANALYSIS

Hanan Aboel Farag and Mohamed Sayed Abed

Working Paper No. 1152

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Abstract

This paper traces the effect of “Greenfield Investment” disaggregated into six sectors on the one hand and the effect of external debt on the other hand on sectoral output and employment in Egypt over the period 1983-2014. We conducted our analysis in three stages; an aggregate time series analysis (ARDL error correction model), a sectoral time series analysis and finally a panel model in conducted (panel ARDL model). Research results reveal that the effect of real FDI and external debt on growth is either insignificant or even negative in the long-run, although the effect of FDI was positive in the short-run. Concerning employment; the effect of external debt on the employment level is insignificant while that of FDI is positive in the long-run.

JEL Classification: F1

Keywords: Greenfield investment; ARDL model; external debt

ملخص

تتبع هذه الورقة أثر "الاستثمار الأخضر" المصنف في ستة قطاعات من جهة، وتأثير الدين الخارجي من جهة أخرى على الناتج القطاعي والعمالة في مصر خلال الفترة 1983-2014. قمنا بتحليلنا على ثلاث مراحل. والتحليل التجميعي للسلاسل الزمنية (نموذج تصحيح الأخطاء في أردل)، وتحليل السلاسل الزمنية القطاعية، وأخيرا نموذج الفريق الذي تم إجراؤه (نموذج لوحة أردل). وتبين نتائج البحوث أن تأثير الاستثمار الأجنبي المباشر الحقيقي والديون الخارجية على النمو إما ضئيل أو حتى سلبي على المدى الطويل، على الرغم من أن تأثير الاستثمار الأجنبي المباشر كان إيجابيا على المدى القصير. وفيما يتعلق بالعمالة؛ فإن أثر الدين الخارجي على مستوى العمالة ليس له أثر يذكر في حين أن أثر الاستثمار الأجنبي المباشر إيجابي على المدى الطويل.

1. Introduction

An intense debate has emerged on the effects of foreign capital flows on developing economies; however, much of that debate has been based on limited empirical evidence, as most of these studies were either cross-country analysis or concerned with one type of capital flow. Egypt lacks studies assessing the impact of foreign capital inflows combined on economic growth and employment level.

Review of previous studies as well as an empirical analysis will be used to test the effect of foreign capital inflows on economic growth and employment level in Egypt. We test the hypothesis that “Greenfield Investment” and external debt have a positive effect on economic growth in Egypt. The second hypothesis to be tested is that Greenfield investment and external debt have a positive effect on the employment level in Egypt.

This research paper will be divided into six sections; the second will give an overview of the magnitude and trend of various sources of foreign capital inflows into Egypt. Theoretical background on the effect of foreign capital inflows on the economy is given in the third section and the fourth section will include an overview of previous empirical studies. The econometric model will be examined in the fifth section, finally the sixth section summarizes the study results and suggests some policy recommendations.

2. The Trend of Foreign Capital Flows into Egypt

According to the “World Bank International Debt Statistics”, net capital flows can be divided into net equity inflows (net inflows of direct and portfolio equity) and net debt flows (from official or private creditors).

FDI is usually considered stable while portfolio investment is frequently depicted as the least reliable type of flow (Sula; Willett, 2009). Portfolio investors can sell their stocks or bonds more easily and quickly than FDI and these flows are often considered to be the hottest of the various major types of capital flows. Concerns about portfolio flows come mainly from the high liquidity; at the first sign of trouble investors can easily sell their stocks and bonds. Analyzing the data for portfolio inflows to Egypt during the period 1997-2012 reveals several fluctuations; as shown in Table (1) (in Appendix I), the percentage change in portfolio inflows varies severely from year to year. Therefore, this research will analyze the trend of FDI and external debt flows and its effect on the Egyptian economy.

By the late 1980s, Egypt faced chronic macroeconomic problems; inflation exceeded 20%, the current account was in deficit to the tune of 8 % of GDP. Real per capita growth of GDP averaged 0.2 % per annum during the (1986 -1993) period. That had weakened Egypt’s attractiveness to foreign investors, and it became highly dependent on loans and grants to close the gap between savings and investment (Abdel-Wahed, 2003). In 1989, external debt as a percentage of GNI reached 116% according to the World Bank data. Consequently, the government signed agreements with the World Bank and the IMF in order to face these macroeconomic imbalances. Those agreements include the “Economic Reform and Structural Adjustment Program” (ERSAP) and the Structural Adjustment Loans (SAL) (Korayem, 1997).

The economic reforms introduced in the 1990s seemed to follow the preferential policy prescriptions of the “Washington Consensus”¹, which advocated privatization and liberalization of markets and the rollback of the state in economic affairs. Therefore, acquisitions and partial acquisitions represented an easier entry path for FDI. The privatization

¹ The Washington Consensus refers to a set of broadly free market economic ideas, supported by prominent economists and international organisations, such as the IMF, the World Bank, the EU and the US.

program slowed after 1997 - with most successful firms sold -opening the way for Greenfield investment².

In spite of the FDI flows that Egypt received in the 1990s, it can be considered at low levels compared with other developing economies, that was mainly due to; first, in the early 1990s; the success in containing inflation was at the cost of a cumulative real appreciation limiting the ability to compete in the domestic and foreign markets, therefore, reducing Egypt's FDI attractiveness. Second, in the late 1990s; the 1997 Luxor massacre and the 1997-1998 East Asian economic crises weakened the positive effects of the ERSAP, resulting in modest FDI flows (Kamaly, 2011). FDI stock decreased from 22% of GDP in 1990 to 14% of GDP in 2000. During this period, real external debt remained nearly stable; it decreased slightly from \$ 32,960 million to \$31,060 million in 1999 (World Development Indicators Database, WDI) as shown in Figure (1) in Appendix II.

By 2001, there was a series of devaluations of the pound. By the end of 2002 the devaluation reached 35.3% of the fixed exchange rates of 1998/99. Despite these measures the economy was falling into recession as growth rate decreased to 2.5% and inflation started to rise, consequently, the attractiveness of the Egyptian economy is reduced by uncertainty. Real FDI inflows decreased by more than 80% during the period (2000-2003); \$1,298 million to \$222 million (FDI stock represented 23% of GDP in 2003) as shown in Figure (2) in Appendix II. Real external debt decreased to reach \$ 772 million in 2003, but it increased as percentage of GDP; from 29% in 2000 to 36% in 2003 (WDI Database).

The appointment of a new cabinet in 2004, and its efforts to improve the investment climate and encourage domestic and foreign investment enhanced the attractiveness of Egypt as a business location, the ascent of FDI to Egypt started in 2004, and continued uninterruptedly until reaching the peak of US\$ 209.8 million in 2007 as shown in Figure (4) (in Appendix II). In 2009, real FDI inflows dropped by about 50% compared with 2007, this is highly attributed to the Global financial crises.

External debt experienced an upward trend – increasing from \$30.7 billion in 2004 to \$36.5 billion in 2010 and then increased to \$39.6 billion in 2014. The increase in external debt in the period 2004-2010 was highly attributed to the global shock that hit Egypt in mid-2008 (the global financial crisis), it was mostly an aggregate demand shock that reduced demand for Egyptian exports and lowered private investment due to increased uncertainty and weakened FDI³. Then, after the revolution in 2011, state revenues, especially tax proceeds, were negatively affected by the witnessed political and economic instability; this had a negative effect on tourism revenues, exports and FDI. However, in real terms, there was a great decrease in external debt over the period 2004 -2014 as shown in Figure (5); decreasing from \$716 million in 2004 to \$326 million in 2014.

Figure (6) shows that external debt reached 13% of GDP in 2014 down from 39% in 2004, while FDI stock reached 35% of GDP during the year 2008, then declined to 27% of GDP in 2014.

According to the Egyptian Central Bank, total external debt increased by 6.6% in the FY 2015 to reach \$48.1 billion at end June 2015. Total external debt fell from 15.6% of GDP at the end of June 2014 to 14.9% at the end of June 2015 (Central Bank, 2015).

Regarding the sectoral distribution of FDI, Oil and Gas sector has received the bulk of FDI into Egypt, although privatization and liberalization that picked up in the 1990s has prompted FDI

² Greenfield investment is a form of FDI where a parent company starts a new venture in a foreign country by constructing new operational facilities from the ground up, in addition to hiring new employees.

³ Distribution by creditor indicates that 42.9 % of Egypt's external debt is owed to four countries; namely, Japan (11.9 %), France (10.9 %), USA (10.2 %), and Germany (9.9 %).

in a range of industries, in particular cement, telecommunications and tourism. By 2002, the Government of Egypt completed the sale of the majority of the public enterprises slated for privatization, generating a large amount of revenues.

Figure (7) shows the sectoral distribution of inward FDI into Egypt during the period (2006-2010); oil and natural gas extraction accounted for 57% of total Inward FDI flows. Financial services have managed to attract sizeable amounts of Inward FDI, approximately 11% of the total over the same period. Another industry group is Information Technology (IT) and communications, which accounted for 5% of total Inward FDI.

Analyzing the sectoral composition of non-petroleum green-field investment provided by GAFI; it is apparent that Egypt became successful recently in diversifying its sectoral FDI flows. Figure (8) shows that non-petroleum green-field investment is more diversified in the year 2014 compared with 2004 where the manufacturing industry and financial services attracted sizeable amounts of FDI.

3. Theoretical Background

As this research is concerned with FDI and external debt, those flows and their effect on both growth and employment will be reviewed in the following subsections.

3.1 The effect of FDI and external debt on growth

3.1.1 Concerning FDI

Juma (2011) asserted that there are two major theories that explain why FDI should have a positive impact on growth; according to Solow neoclassical growth model (1956), an increase in the capital stock available in an economy leads to an increase in production, which then corresponds to an increase in the growth rate of output. Since FDI is additional capital, an increase in foreign-owned capital stock then leads to higher growth. However, assuming diminishing returns to capital, any increase in the growth rate observed after an increase in the stock of FDI is not sustained in the long run. This implies that within the neoclassical framework, FDI acts as a driver of growth in the short run.

Beyond direct capital formation, FDI can affect growth within the framework of endogenous growth theory, which emphasizes the accumulation of knowledge as the driver of long-run economic growth (Borensztein et al, 1998). The literature identifies four main channels of technological spillovers from Multinational Firms (MNFs) to local firms, namely: the imitation effect, the training effect, the competition effect and the linkages effect.

Through contact in the marketplace, local producers might copy the new technologies used by MNFs causing increased production; this diffusion mechanism is called the imitation effect (learning-by-watching effect). The second form of technology diffusion is training; foreign firms will need to train local workers to make good use of the advanced technologies that they introduce to local markets, when workers and managers employed in foreign firms move to other domestic ones; this increases productivity and causes an increase in the stock of knowledge in the host country, leading to higher output and growth in the long-run.

The competition effect occurs when this increased competition forces domestic firms to become more efficient in their production processes or to invest more resources in upgrading their technology. It is important to note that both the imitation and competition effects are likely to occur simultaneously and their impact on local competition depends on the size of the technology gap and the market size.

The final channel through which foreign affiliates can have productivity spillover on local firms is the linkages effect, also known as vertical (or forward and backward), spillovers. The forward linkage occurs when MNFs supply high quality inputs and/or at a lower price to domestic producers (Crespo and Fontoura, 2007). If these inputs are more advanced than those

previously available to local firms, then they upgrade the technology available to domestic firms, leading to increased output⁴ (Juma, 2012). With increasing returns to scale, foreign firms may benefit domestic suppliers if they increase the demand for local inputs; this is the case of backward linkage. This spillovers effect can benefit domestic suppliers through direct knowledge transfer and the requirement of higher quality inputs (Javorcik, 2004).

Brooks (2003) added two other channels through which host economies can benefit from FDI:

- Foreign investment gives advantage in terms of export market access arising from economies of scale in marketing of foreign firms or from the ability to gain market access abroad (Vong, 2007).
- Foreign investment may result in increased domestic investment, in this case, FDI have a beneficial crowding-in effect by increasing demand to local suppliers (complementary relationship).

While the above discussion focuses on the positive spillover of FDI, some arguments arise stating that the entry of MNEs could harm host economies if the foreign firms completely push out domestic firms from the market. The presence of the so-called “market stealing effects” - where MNEs take an increasing market share from domestic players - leads to decreasing production of domestic firms. As domestic firms cut back production, they may experience higher average cost; since fixed costs are spread over a smaller scale of production (Anh, Thang et al. 2008). Furthermore, as Nunnenkamp and Spatz (2003) explain, different types of FDI might have different impacts on growth; if a host country primarily receives resource-seeking FDI, then the extractive nature of such investment might hamper its ability to generate positive spillovers for the host economy.

3.1.2 Concerning external debt

According to traditional neoclassical models, at initial stages of economic development, developing countries have limited capital stocks and investment opportunities; therefore, capital mobility increases the economic growth. As long as these borrowed resources are used for productive investment, economic growth increases, and macroeconomic conditions improve.

However, a high level of accumulated debt may negatively affect investment and economic growth. The definition of debt overhang varies with Krugman (1988) defining debt overhang as “the presence of an existing inherited debt sufficiently large that creditors do not expect with confidence to be fully repaid.” This gives the basis for the “Debt Overhang Hypothesis” given by the IMF which stated that “the debt overhang hypothesis does not describe a situation where foreign debt is merely large, but one in which the existence of foreign debt distorts the relevant margins considered for production and investment decisions.” (Sundell, Lemdal, 2011). However, the extent to which investment is discouraged by debt overhang depends on - as Karagol (2002) asserted - the government’s ability to generate resources to finance debt service obligations.

Another strand of the “debt overhang theory” emphasizes the point that large debt stocks increase expectations that debt service tends to be financed by distortionary measures such as inflation tax and cuts in public investment. Such uncertainty urges private investors to wait or invest less; another option may be capital flight which occurs when assets or money rapidly flow out of a country, due to an event of economic consequence. Such events could be subsequent distortions due to high external debt. (Loko; Mlachila, 2003).

⁴It is important to note that the upgrade of production quality may lead to an increase in prices, if domestic firms do not have the capacity to benefit from this upgrade of quality, they will suffer the negative effects associated with increased costs (Javorcik, 2004b).

In addition, higher debt service can raise the government's interest bill and the budget deficit, reducing public savings; this may either raise interest rates or crowd out credit available for the private investment, dampening economic growth; this channel is known as the "crowding out" effect (Clements et al., 2003).

3.2 The effect of FDI and external debt on employment

3.2.1 Concerning FDI

According to trade theory; FDI inflows improve resource allocation and thereby increase labor productivity and employment in host countries. This is consistent with the results given by Caves (1996) who considered FDI as engine for growth since it would increase productivity, technology transfer and reduce unemployment. Consequently, various countries exert great efforts to attract FDI in order to reap the potential positive effects that this would have on economy (Denisia, 2010).

However, it is also possible for FDI to have very little or even negative effects on employment. In case of local companies that are privatized into hands of foreign investors, no initial increase in employment will reveal and if the foreign owner subsequently rationalizes the firm, employment is even likely to decrease (Jenkins, 2006). It is important to identify circumstances under which it has a significant positive impact, if such investment involves the creation of new "greenfield" plants, demand for labor will tend to increase. Also, if this FDI is concentrated in labor-intensive industries, this increase will be substantial.

More specifically, the effect of the FDI on employment can be expressed in four different effects of (Chen, 2012):

- 1- Employment Creation: in this case FDI brings new production capacity and new jobs; also, it can improve the development of relevant industries.
- 2- Employment Crowding-out: in this case inflow of the FDI makes the competition more intensive; consequently, some domestic enterprises have to reduce employment in order to improve their competitiveness.
- 3- Employment Shift: in this case; the cooperation between foreign and domestic companies will create joint ventures that will make workers transfer to new enterprises.
- 4- Employment Loss: in this case those who do not meet the efficiency required by the foreign-invested enterprise will lose their jobs.

The effects FDI can have on employment in host country - whether positive or negative - can be transmitted directly or indirectly. The direct effects of FDI on total employment have several channels; Greenfield investments are supposed to generate jobs, as they create new jobs which did not exist before. A reorganization of firms is expected in case of privatizations and other types of acquisitions, the effects on the employment seem to be negligible or negative.

Indirect effects appear to the extent to which FDI decides to buy local inputs where it increases local firms' demand and it has an indirect stimulating effect on employment levels. In contrast, reliance on imports or displacement of existing firms results in job loss.

3.2.2 Concerning external debt

Classical economists viewed public debt as government loan that withdraws funds from productive private employment. In contrast, the fundamental features of the Keynesian approach to the public debt and public finance includes the following argument which states that; to ensure satisfactory levels of output and employment, it can be necessary for the economy to experience public deficits permanently. Keynes considered borrowing for consumption to be as desirable as borrowing for investment in productive goods because consumption expenditure induced investment to rise; consequently, the increase in public debt through multiple effects would raise the national income.

Keynesian analysis reached its core in *Lerner's* "Functional Finance"; viewing government revenue, expenditure and debt as the tools to achieve the goal of stable employment. Lerner (1943) stated that: "Government should adjust its rates of expenditure and taxation such that total spending in the economy is neither more nor less than that which is sufficient to purchase the full employment level of output at current prices. If this means there is a deficit, greater borrowing, printing money, etc., then these things in themselves are neither good nor bad, they are simply the means to the desired ends of full employment and price stability". However, as soon as the economy reaches full-employment, there is no need for further borrowing. Consequently, the absolute size of the national debt does not matter at all, what matters is government's ability to promote full employment and price stability; the economic effect of public debt should be analyzed in the light of the nature of the expenditures for which debt is incurred and whether it would be used to generate income effectively or not.

A.H. Hansen, the chief advocate of modern theory, also declares that, "Public debt is an essential means of increasing employment and has become an instrument of economic policy today." Harold G. Moulton maintains that, "Public debt is a national asset rather than liability and it is essential for the economic prosperity of the country" (Yadav, 2015).

However, the failure to utilize debt productively, mobilize investment and create new employment opportunities in developing economies, eventually creates a dilemma of lower revenue base which affects spending capacity and in turn higher debt servicing.

4. Empirical Literature Review

Given the focus of our analysis in this research, we will concentrate on two capital flows; FDI and external debt and their effect on the economy. The results obtained in the empirical literature concerning foreign capital flow's effect on growth in host countries will be reviewed below.

4.1 The effect of different capital flows on economic growth and employment in Egypt

A number of studies analyzed the effect of different capital flows on economic growth in Egypt. Mohamed (2003) empirically examined the effect of foreign capital inflows (foreign aid and FDI) on economic growth in Egypt through savings and investment. Empirical work results - using time-series data for 26 years (1970-1995) - showed that foreign capital inflow has a significant positive effect on savings and investment and in turn on the economic growth rate. Therefore, investment, if productive, will increase the productive capacity of an economy and hence national income.

Since FDI is not an aggregate phenomenon, rather, FDI has different components: Greenfield FDI and mergers and acquisitions (M&A); these different components have different effects, and should not be treated as a homogenous group under the title FDI (Massoud, 2008b).

Only two studies analyzed the effect of the sectoral distribution of FDI on economic growth in Egypt. They disaggregated FDI to three only sectors; agriculture, manufacturing and services; Massoud (2008a) in her research that covers the period 1974-2005 found that manufacturing FDI affects growth positively and significantly when it interacts with the stock of human capital and when it interacts with exports. FDI to the agriculture sector yielded negative impact on growth. This could explain the ambiguous effect that aggregate FDI has on growth, as its different components have contradicting effects in each country.

The second study is that held by Hanafy (2015), investigating the effect of sectoral FDI on economic growth in Egypt, using a panel dataset of 26 Egyptian governorates for the period 1992–2007. The study results showed no significant effect of aggregate FDI stock on economic growth in Egyptian governorates, which can be partly explained by the contradictory growth effects of FDI at the sectoral level. However, when he disaggregated FDI stock by sector, Hanafy found a positive effect of manufacturing FDI, a negative effect of agricultural FDI and

no significant effect of services FDI on economic growth. Note that UNCTAD World Investment Report (2001) argues that “in the primary sector, the scope for linkages between foreign affiliates and local suppliers is often limited. The manufacturing sector has a broad variation of linkage intensive activities but there are large variations by industry. In the tertiary sector led by finance, trading, tourism and utilities, the scope for dividing production into discrete stages and subcontracting out large parts to independent domestic firms is also limited.”

Concerning the effect of FDI on employment; Massoud (2008b) revealed that aggregate FDI had an insignificant effect on the demand for labor, except when it interacted with the size of the technology gap; aggregate FDI had a negative effect impact on the demand for labor. Concerning the different FDI modes of entry and sectoral distribution of FDI; Greenfield FDI and manufacturing FDI had a positive effect when they interacted with the level of human capital and exports, while M&A, agriculture and services FDI had negative effects.

Abuzaid (2011) investigated the impact of external debt on economic growth and external debt service on investment in three Arab countries (Tunisia, Egypt and Morocco) using a macro econometric model estimated for the period 1982-2005. The empirical findings reveal that external debt does not affect growth directly; however, external debt affects investment positively. Furthermore, the result also confirms that there is no sign of a crowding out effect through which external debt service is hypothesized to affect investment. This research suggests that these countries need to supplement their lack of domestic saving with external loans and other forms of foreign capital such as FDI.

4.2 Studies that analyze the effect of foreign capital flows on economic growth and employment in both developed and developing countries

Most of the studies conducted in this regard are cross section studies analyzing the effect of foreign capital flows on the economy in several countries.

Aizenman, Jinjark and Park (2011) investigated the relationship between economic growth and lagged international capital flows (more specifically; FDI, equity investment, and short-term debt) for about 100 countries during the period 1990-2010. Both lagged FDI inflows and lagged equity investment have a positive effect on GDP per capita, however, the association between growth and lagged equity flows is smaller than, and less stable than that with FDI flows. In contrast, the association of growth and lagged short-term debt is nil before the global financial crisis, and large negative effect during the crisis. Thus, empirical results provide some support for the popular perception that FDI is more beneficial for the country's economy than other types of inflows.

Another study carried out by Benamoun and Lehnert (2014) tried to explore the effect of remittances, FDI, and “Official Development Assistance” ODA on economic growth; they used panel data including 180 countries (low-income and middle-income countries) over the period 1990-2006. Results present strong evidence that the three sources of finance are conducive to economic growth especially in low-income countries. Those results contrast with that suggested by Wamboye (2012) whose empirical study covers the period 1975 to 2010. He concluded that FDI did not have any apparent meaningful effects on economic growth of least developed countries, while external debt depresses economic growth of those countries.

Two studies investigated the effect of external debt on economic growth; First: Ejigayehu (2013) in his thesis examined whether external debt affected the economic growth (through debt overhang and debt crowding out effect) of selected heavily indebted poor African countries. This was carried out by using data for eight heavily indebted poor African countries during the period 1991 to 2010. Ejigayehu distinguishes between two ways through which external debt may affect economic growth; when an accumulated debt discourages and

overhangs investment, mainly private investment, this is known as the debt overhang effect; this is because private investors expect an increase in tax by government to pay the accumulated debt. The second effect is known as debt crowding out effect; when income from export is used to pay the accumulated debt, this in turn may negatively affects investment as those resources are not directed to investment and growth. The empirical analysis showed that the impact of external debt on economic growth is statistically significant in terms of debt crowding-out effect over the selected countries. In this case, indebted poor countries transfer resources, including foreign aid and foreign exchange resources to service their accumulated debt. On the other hand, the effect of external debt on economic growth is found to be statistically insignificant in terms of debt overhang effect.

The second study used data on a sample of 40 countries from Europe, MENA countries (including Egypt), Asia Pacific and Latin America over the period 1965-2010, Chudik et al (2013) investigated the long-run effects of public debt and inflation on economic growth. They found significant negative long-run effects of public debt and inflation on growth. Moreover, this research concluded that if the debt to GDP ratio is raised and this increase turns out to be permanent, then it will have negative effects on economic growth in the long run. In contrast, if the increase is temporary, then there are no long-run growth effects so long as debt to GDP is brought back to its normal level.

Concerning the effect of FDI on employment, a comparative study on employment creation in Argentina, Brazil and Mexico, undertaken by Ernst (2005) revealed that the general assumption that high levels of FDI will lead to a strong increase in production and employment is misleading. This research illustrated the sectoral distribution of FDI and its effect on employment; FDI favored the services sector in the 1990s, but created little employment because of the nature of the sector and because of rationalization measures, particularly in privatized companies and banks. FDI in the manufacturing sector did not create employment; it may even have reduced it in Argentina and Brazil, especially in transport equipment. Mexico experienced positive FDI and employment growth in the manufacturing, mainly due to a boom in the export sector in the 1990s, but FDI has been declining constantly and significantly since 2000, so as employment. Moreover, FDI did not go to high labor-intensive activities as suggested by neoclassical economic theories.

This study had an important conclusion that employment levels increase more through vertical Greenfield FDI - in the export sector - which creates new production plants; however, it did not have a multiplier effect on the rest of the economy. Other forms of FDI flows did not lead to the establishment of new production units; rather, they resulted in a change of ownership through privatization and M&As. In this situation FDI does not create new jobs in the short-run, in the medium-term restructuring and rationalization take place resulting in job losses, in the longer run, firms may increase investment and new jobs can be created (Grazia, 2005).

It is apparent that empirical literature provides mixed results on the relationship between foreign capital flows and growth or employment; this may be due to difference in the terms of geographical or economic area covered and methods adopted during analysis. Moreover, cross-sectoral studies have the advantage that they enable analysis of the impact of the different technological and economic contexts. Since political and institutional structures vary from country to country, this paper will utilize sectoral data for Egypt which is essential in forming a better growth strategy.

5. Empirical Analysis

Massoud (2008a) estimated the effects of aggregate FDI inflows on economic growth after controlling for other growth determinants during the period 1974-2005, she concluded that FDI did not exert any positive significant effect on economic growth, the effect was either negative

or insignificant; the suggested explanation for those puzzling econometric results was that FDI to different sectors has different effects.

Based on these findings we can start our analysis by concentrating on specific sectors that compose a high percentage of GDP and are also important in terms of employment and investment. The novelty of this research is that we will use a non-traditional view of GDP; excluding the petroleum sector and including only six sectors to our GDP calculation, most of those sectors are labor intensive and they represent 65% of GDP during the period 2006-2010⁵, also they represent about 40% of FDI inflows during the same period. The concerned sectors include financial, manufacturing, agricultural, service, construction and tourism sectors. This research allows us to concentrate on those specified sectors whose effect on growth is highly ignored by other researches. We will include two basic models; one for economic growth and the other for employment level.

The basic data sources employed are the World Bank's World Development Indicators' database, the Egyptian "Central Agency for Public Mobilization and Statistics" CAPMAS, the Egyptian Ministry of Planning and the Egyptian "General Authority for Investment and Free Zones" GAFI. Data comprises six sectors and covers the period 1983-2014.

5.1 Research methodology

Concerning the growth model; the dependent variable is non-traditional real Gross domestic product (lnRGDP), while the independent variables (in ln form) include; the stock of real FDI (lnrfdi), the stock of domestic investment (lnrdominv), real external debt stock (lnrext) and employment level (lnemp). Investment either foreign or domestic is expected to have a positive effect on growth; also, employment is expected to have a positive effect, while external debt is expected to have a negative effect. The growth function will take the following form:

$$\ln RGDP = f(\ln rFDI, \ln rdominv, \ln rext, \ln emp)$$

The dependent variable in the employment model is lnemp, the independent variables include; ln rFDI, ln rext and the capital labor ratio (K/L). We expect a positive effect to be exerted on employment by RFDI, while we expect that rext and K/L will have a negative effect. The employment function can be illustrated as follows:

$$\ln emp = f(\ln rFDI, \ln rext, K/L)$$

Although the equilibrium long-run relationship can be estimated directly, it is also important to consider the short-run dynamics of the variables under consideration. This can be illustrated by the "Autoregressive Distributive Lag approach" ARDL model either time series or panel ARDL for the sectoral data.

The empirical analysis is conducted in three stages, first; we examine the effect of aggregate FDI of the six sectors specified earlier in addition to external debt on aggregate GDP and employment of the same sectors. To get a clearer interpretation of the results; we conduct the second stage; a time series analysis which handles each sector separately. Finally; we will conduct a panel data analysis.

As a preliminary step, we conducted a Stepwise-Forward least square (stepwise LS) as modern econometricians have utilized theory and stepwise regression in selecting variables used in constructing the respective models. This approach begins with no additional regressors (or only one regressor which represents the interest of the researcher) in the regression; then adds the variable with the lowest p-value. The variable with the next lowest p-value given that the first variable has already been chosen, is then added. Next both of the added variables are checked

⁵ They represent 72% of GDP during the study period (1983-2014).

against the backwards p-value criterion. Any variable whose p-value is higher than the criterion is removed.

The Stepwise least square method follows “Ordinary Least Squares” (OLS) which is suitable for stationary variables where the means and variances of the variables being tested are constant over time. Variables whose means and variances change over time are known as non-stationary or unit root variables. Incorporating non-stationary or unit root variables in estimating the regression equations using OLS method give misleading inferences (Allaro, Kassa & Hundie, 2011).

However, Perron (1989) showed that failure to allow for an existing break leads to a bias that reduces the ability to reject a false unit root null hypothesis. To overcome this, Perron proposed allowing for a known or exogenous structural break in the Augmented Dickey-Fuller (ADF) tests. Following this development, many authors including, Zivot and Andrews (1992) and Perron (1997) proposed determining the break point ‘endogenously’ from the data.

Given that the breaks were absent under the null hypothesis of unit root, there may be tendency for this test to suggest evidence of stationarity with break (Lee and Strazicich, 2003). In this case, we can use OLS estimation method using the stationary variables whether containing structural break or not, in addition to dummy variables to account for the break; the dummy variable takes the value one only for one observation in the year of the structural break specified by Zivot and Andrews (Z&A) tests. Therefore, we apply the stepwise LS for the same aggregate model estimated earlier with adding the dummy variables specified Z&A tests for the break-stationary variables.

After estimating the parameters of the model using Stepwise regression method; we applied the ARDL. The ARDL is becoming popular because of several advantages in comparison with other single equation cointegration procedures; this results from its ability to estimate the long and short-run parameters of the model, also, the ARDL approach to cointegration is a latest used econometric technique to analyze the data even stationary at level or first difference. Furthermore, the ARDL procedure is statistically much more significant approach to determine the cointegration relationship in small samples; it allows using different optimal lags of variables. The ARDL framework includes; first; testing for the existence of any long-run relation among the variables using the bound test of cointegration, second, if we find cointegration among variables, we estimate the long-run and the short run coefficients (Pesaran et al., 2001). After that, we test for serial correlation by Breusch-Godfrey serial correlation LM test and finally, we examine the stability of the model by CUSUM test.

We used the Augmented Dickey-Fuller (ADF) test of stationarity for all the variables used in our analysis and found that they are stationary either at level or at first difference. Utilizing Eviews 9 facilitates the time-series ARDL estimation; the package offers built-in lag-length selection methods after specifying the maximum number of lags, in addition to conducting the bound test and specifying the long-run and short-run coefficients.

In the second stage; we utilized OLS method; the first step before conducting OLS model is to conduct unit root tests for sectoral data using ADF unit root test, however, as stated earlier the traditional ADF unit root test is not consistent in the presence of structural breaks (Glynn et al., 2007), to overcome this limitation; we conduct Z&A test.

We have to note that there is no available data concerning the flow of external debt to each sector, therefore; the individual sectoral analysis concentrates on the effect of FDI on sectoral output growth.

In the third stage; the “Pooled Mean Group” (PMG) approach appears to be the appropriate choice for our models (also known as panel ARDL) as we conduct sectoral analysis where different sectors have access to the common technologies and have common economic

conditions, so, we can assume common long-run parameters across sectors. However, the speed of adjustment to the long-run steady state and the short-run parameters, which are determined by sectoral specific factors, are more likely to be different across sectors. We also estimate a “Mean Group” (MG)⁶ alternative, which allows the long-run parameters to vary, and then test the PMG’s pool-ability assumption through a Hausman test⁷ in order to choose between PMG and MG models.

The PMG model solves the problems of serial autocorrelation and endogenous regressors by choosing the appropriate lag structure for the dependent and independent variables. However, there are several requirements for its validity, consistency and efficiency, those include; the existence of a long-run relationship among the variables of interest which requires the coefficient of the error correction term to be negative and significant. Another advantage of this model is that it can be used even with variables with different order of integration irrespective of whether the variables under study are I(0) or I (1) (Pesaran, 1997).

Consequently, the novelty of this model is that short-run adjustment is allowed to be sector-specific; utilizing sectoral data for each of the FDI, GDP, employment and domestic investment giving a clear picture of the effect in each sector, in addition to the interaction effect among sectors whose effect will appear in the homogeneous coefficients in the long-run.

5.2 The first stage: the effect of foreign capital inflows on economic growth and employment (aggregate analysis)

As stated earlier, we will start our analysis by examining the effect of FDI in addition to external debt on economic growth and employment (six sectors aggregate). The results of ADF and Z&A unit-root tests specifying the structural break are stated in Table (2) in Appendix I. The independent variables included in the growth model are; $\ln rFDI$, $\ln rdominv$, $\ln rnext$ and $\ln emp$ ⁸ and none of them were removed by the stepwise LS (the dependent variable is $\ln rGDP$). The results of this model revealed that; FDI has an insignificant effect on GDP, domestic investment and employment has a positive effect, while external debt has a negative effect as shown in Table (2) in Appendix II.

Then we conducted the ARDL growth model, the optimum lagged orders of the model based on Akaike information criterion is ARDL (1, 2, 1, 0, 0) for the variables ($\ln rGDP$, $\ln rFDI$, $\ln rdominv$, $\ln rnext$, $\ln emp$).

Table (4) reports results of the bound test for the existence of a long run relationship. The F-statistics is above the 10 % critical bounds, thus the null hypothesis of no cointegration can be rejected, i.e., there exists a long relationship among the variables of our model.

After ensuring the existence of cointegration among variables, we will interpret the error correction model and the long-run coefficients as illustrated in Table (5). It is apparent that the error correction term is negative and statistically significant at 1% level, ensuring that long-run equilibrium can be attained; deviations from the long-term equilibrium are corrected every 3 years.

⁶ The Mean Group (MG) estimator estimates separate equations for each sector and averages the resulting long-run coefficients. This estimator always produces consistent estimates, but it does not take into consideration that parameters may be identical across sectors in the long run.

⁷ The Hausman test evaluates the consistency of an estimator when compared to an alternative; it can be used to select between the MG and PMG models under the null hypothesis that the pool-ability restrictions imposed by the PMG are valid. The calculated p-value is greater than 5%, we cannot reject the null hypothesis and we conclude that the PMG is consistent in this model and more efficient than the MG estimator.

⁸ Note that the dummy variables accounting for the year of structural break are included in this regression

In this estimation, although the effect of both FDI (the first lag)⁹ and domestic investment were positive in the short-run, in the long-run; the coefficient of both became insignificant, also the effect of employment on growth was insignificant. The effect of real external debt was negative both in the short-run and long-run (a 1% increase in external debt will lead to 0.38% decrease in GDP). Note that the estimated model is stable as CUSUM test reveal. Also, it is free from serial correlation (as the probability of chi-square of Breusch-Godfrey serial correlation LM test is 0.52).

The second model to be estimated is the employment model, we will similarly use stepwise LS and then ARDL model in order to get the short and long-run relationships. The dependent variable is $\ln emp$, the independent variables after conducting stepwise LS include; $\ln rfdi$, $\ln rrex$ and k/l , note that $\ln rdominv$ was removed from the model. Results of stepwise LS – illustrated in Table (6) - reveal that FDI has a positive effect on employment (a 1% increase in FDI leads to 0.28% increase in employment). External debt and capital-labor ratio has a negative effect on employment.

The same variables were used in the ARDL model, the optimum model based on Akaike information criterion is ARDL (1, 0, 0, 2). The long-run results of this model concerning FDI coincides with the stepwise LS as FDI has a positive effect on employment by approximately the same coefficient of the previous model (0.27), while external debt has an insignificant effect and capital-labor ratio has a negative effect on employment. The short-run results show the same directional relations except for external debt whose effect on employment is insignificant. The result of the bound test of this model is presented in Table (7); the F-statistics is above the 5 % critical bounds, thus there is a long relationship among the variables of our model, the speed of adjustment is 0.38, so about 3 years or even less are needed for long-run equilibrium to be attained. This model is stable and has no serial correlation as the probability of chi-square of Breusch-Godfrey serial correlation LM test exceeds 5%.

After conducting this aggregate analysis, we want to get deeper understanding of the results; consequently, we will repeat our analysis utilizing sectoral data. The next two sections include; time series analysis for each sector separately and panel data analysis conducted by pooling time-series observations across different cross-sections.

5.3 The second stage: the effect of foreign capital inflows on economic growth and employment; individual sector analysis

5.3.1 Unit root test

We test the stationarity of variables by using ADF and Z&A unit-root tests with one structural break. We divide variables into two groups; one that is common across sectors and the other group vary by sector. Common variables¹⁰ include: Education as a percentage of GDP (EDUGDP), gross enrolment (GENROL), export ratio (EXPR), inflation (INF) and government consumption ratio (GOVCR) those variables were stationary according to ADF unit root test except GOVCR. To check whether GOVCR become stationary when taking into account the existence of a structural break, the Z&A test was conducted revealing that it became stationary after including a structural break in the year 1990, this break coincides with the beginning of the Egyptian Reform Program.

Variables that vary by sector include; sectoral output ($\ln OUTPUT$), sectoral FDI stock ($\ln rfdi$), sectoral real wage ($\ln rwage$), and sectoral employment ($\ln emp$); for $\ln emp$ and $\ln rfdi$ the break was either in the year 2008 or 2009 in almost all sectors revealing that they were

⁹ In the short-run, the second lag of $\ln rfdi$ had a negative significant effect on growth

¹⁰ Common variables are variables that do not differ by economic sector.

greatly affected by the Global financial crisis. Results of ADF (for stationary series) and Z&A tests (for the non-stationary series) are illustrated in Table (9).

5.3.2 OLS regression results

After conducting Z&A test, it is apparent that all series are stationary at levels; therefore, we can now conduct OLS regression by adding a dummy variable which captures the break for the variables that need one.

The first model to be estimated is to capture the effect of RFDI on sectoral output in each sector. The conducted regression includes “lnOUTPUT” as a dependent variable and lnRFDI and employment (lnEMP) as independent variables in addition to a set of other sector-related independent variables.

Regression results reveal that RFDI has a positive effect on sectoral output in four sectors, namely; financial, manufacturing, agriculture and tourism, with the financial sector having the highest coefficient (0.26) and agricultural sector having the lowest coefficient (0.074). RFDI has an insignificant effect on growth in the construction and service sectors.

Employment seems to have a positive effect on sectoral output growth in all sectors. Although education was expected to have a positive effect on growth as it represents investment in human capital; it is apparent that it had no effect in the financial, construction and service sectors, while gross enrollment has a small positive effect in the manufacturing and tourism sectors. In addition, the effect of export ratio on growth is either insignificant or negative; this has an important implication in our study where FDI inflows seek natural resources and large local market but not the availability of skilled labor or export oriented sectors.

The summary of the results from the individual sectors’ regression are presented in Table (10), the R^2 for all models exceed 80% and the Durbin Watson statistic is 1.4 or more in almost all of them¹¹. The P-value for the F-test of overall significance test is less than 1% for all sectors denoting that the coefficients are jointly not all equal to zero.

The second model to be estimated is to capture the effect of FDI on employment in each sector. This regression model includes ln EMP as a dependent variable and lnRFDI, lnRGDP and lnRwages as independent variables in addition to a set of other sector-related independent variables presented in Table (11).

The effect of change in RFDI stock on employment is positive in all sectors except the tourism sector where the effect was insignificant. Sectoral output has a positive effect on employment in almost all sectors (it was insignificant in the service and agriculture sector), while wages has different effect among sectors; it has a positive effect only in the financial and tourism sectors. The explanatory power of all models exceeds 85%.

5.4 The third stage: the effect of foreign capital inflows on economic growth and employment; panel data analysis

Since the capital inflows show their effect on the macro and micro variables in a delay of a specific time period, therefore in this section, panel ARDL method, introduced by Pesaran, Shin and Smith is used to analyze the lagged values. The following subsection includes the panel unit root tests conducted for variables used in the two models that follow; the economic growth and the employment models.

5.4.1 Panel unit root test

Though testing for the order of integration of variables is not important when applying the ARDL model as long as the variables of interest are I(0) or I(1), we carry out these tests just to make sure that no series exceeds I(1) order of integration.

¹¹ Only the service and construction sector whose value of Durbin Watson is 1 and 1.1 in those sectors respectively.

For this study we utilize the Im, Pesaran and Shin (IPS) unit root test - which is based on the well-known Dickey-Fuller procedure - to analyze long-run relationships in panel data. This test combines information from the time series dimension with that from the cross-section dimension. The IPS test controls for cross-sectional dependence by using demeaned data. This approach assumes the existence of one common factor with the same effect on all the sectors (Trapani, 2004). The results of the unit root test for sectoral variables for the raw variable and its demeaned version is given in Table (12).

5.4.2 Panel ARDL model

After making sure that all variables are stationary either at level or at first difference, we will estimate the PMG model. Based on Pesaran et al. (1999), the dynamic heterogeneous panel regression can be incorporated into the error correction model using the ARDL technique and stated as follows (Loayza and Ranciere, 2006):

$$\Delta(y_i)_t = \sum_{j=1}^{p-1} \alpha_j^i \Delta(y_i)_{t-j} + \sum_{j=0}^{q-1} \alpha_j^i \Delta(x_i)_{t-j} + \varphi^i [(y_i)_{t-1} - \{\beta_0^i + \beta_1^i (x_i)_{t-1}\}] + \epsilon_{it}$$

Equation (1)

For the growth model; **lnrGDP** is the ln of output level of each sector, **X** is a set of independent variables including ln rFDI stock to each sector in addition to real external debt stock (lnrxt), employment level (lnemp) and domestic investment stock (lnrdominv). α_j^i and α_j^i represent the short-run coefficients of lagged dependent and independent variables respectively, β are the long-run coefficients, and φ^i is the coefficient of speed of adjustment to the long run-equilibrium. The subscripts **i** and **t** represent sector and time, respectively and ϵ_{it} is a time-varying disturbance. The term in the square brackets contains the long-run growth regression. The parameter φ^i is expected to be significantly negative under the prior assumption that the variables show a return to a long-run equilibrium.

This model examines the effect of FDI on sectoral output growth and uses panel data for 6 sectors during the period 1983-2014. ARDL (1, 2, 3, 2, 1) has been chosen by Akaike information criterion for the variables lnrgdp, lnrfdi, lnrdominv, lnemp and lnrxt.

To test the validity of the pooling assumption, we undertake a Hausman test; the test assesses whether the differences in long-run coefficients are not systematic (null hypothesis). The calculated Hausman statistic is 4.16 (*p*-value is 0.24); hence the test does not reject the null hypothesis supporting long-run homogeneity.

The results of the ARDL model are illustrated in Table (13); it is apparent that the estimated model is statistically significant, and the speed of adjustment is negative, so a long-run relationship exists between RFDI and economic growth. About 30% of the disequilibrium in the short run will be corrected annually; therefore long-run equilibrium will need 3.3 years approximately.

In this estimation, the long-run coefficients of real external debt and RFDI are negative and significant; a 1% increase in FDI will cause output to decrease by 0.17% while the coefficient of lnrxt is -0.206. Employment and domestic investment has a positive effect on output both in the long-run. The short-run coefficients were insignificant for all variables used except that of FDI which has a positive effect on growth; in the short-run a 1% increase in rFDI leads to 0.17% increase in growth, this percentage coincides with the opposite decrease in the long-run as stated earlier.

Since the PMG estimator restricts the long-run slope coefficients to be the same across countries but allows the short-run coefficients and the speed of adjustment to be sector specific,

we can analyze cross section results which reveal that the speed of adjustment is relatively high in the manufacturing, agriculture and tourism sectors (exceeds 0.35) where long-run equilibrium is reached every three years or even more.

Comparing the short run coefficients of RFDI in different sectors; it is apparent that the effect on output growth is significant and positive in the agricultural, financial and tourism sectors, while it is insignificant in the rest of the sectors. External debt had an insignificant effect in all sectors except in the tourism sector where it had a negative effect.

The second model to be estimated is the employment model, analyzing the effect of RFDI and external debt on employment level utilizing sectoral data. We will estimate equation (1) for the employment model and the variables used are; $\ln emp$ as dependent variable which is the employment in each sector ($\ln emp$), independent variables include $\ln RFDI$ stock in addition to real external debt stock ($\ln rext$) and the sectoral capital-labor ratio (K/L).

ARDL (1, 2, 1, 1) has been chosen by Akaike information criterion. Then, we undertake a Hausman test, the calculated Hausman statistic is 0.5 (p -value is 0.91); hence, the PMG is more efficient than MG model. The results of the employment model are presented in Table (14).

For the employment model, the speed of adjustment is low as equilibrium will exist every 8 years (its value is 0.13). The long-run coefficient for RFDI is positive and significant (a 1% increase in FDI leads to 0.32% increase in employment). However, external debt has an insignificant effect on employment level and capital-labor ratio has a negative effect. The short run coefficients reveal that FDI has a positive effect on employment while external debt and K/L has a negative effect.

The speed of adjustment for employment in each cross section is also low in all sectors ranging from 5 years to 10 years. The short-run coefficient for RFDI is positive only in the agriculture and construction sectors (labor-intensive sectors), while it is insignificant for the rest of the sectors.

5.5 Summary and interpretation of empirical results

We have undertaken the empirical study in three stages; first; we utilized aggregate FDI of the six sectors specified, aggregate output (non-traditional GDP) and employment of the same sectors in addition to external debt in order to examine the effect of foreign capital inflows on economic growth and employment. The findings reveal that; the effect of real FDI on growth is positive in the short-run but in the long-run it became insignificant, while that of external debt is significant negative both in the short and long-run. Concerning the employment model; the effect of external debt on the employment is insignificant in the short and long-run while that of FDI is positive.

The second stage is concerned with individual sectoral analysis using OLS model supported by dummy variables to account for structural breaks. The studied models reveal that FDI has a positive effect on output in all sectors except the construction and service sectors; this may be acceptable because the percentage of FDI to total investment in each of these two sectors is only about 20%. The financial and tourism sectors' FDI has the highest effect on growth among other sectors. FDI has a positive effect on employment in all sectors except tourism sector.

In the third stage, we conducted a panel ARDL model; the growth model reveals that FDI has a positive effect on sectoral output only in the short-run, but in the long run it turned to be negative. At the same time, FDI has a positive effect on employment both in the short and long-run.

Therefore, the positive impact of FDI on growth is more pronounced in the short-run but in the long run, this effect was either fading out or even becoming negative as a sign of misallocation of resources or crowding-out effect on domestic investment.

The service sector represents 43% of GDP and 37% of employment as a share of the six sectors and the ratio of FDI to total investment is only 20%. Note that service GDP consists of public facilities, water, electricity, sanitation, education, health and Suez Canal receipts. Therefore, the high percentage of this sector in GDP affects the results so as to become negative in the long-run. We analyzed the share of each sector in GDP and FDI (as a percentage of the six sectors sum) in Table (15), in addition to the percent of FDI to total investment in each sector individually in Table (16) in appendix II.

Also, data reveal that the sector that won the highest FDI share among the six sectors in Egypt is the manufacturing sector which accounts for 34%. This sector suffers from high crowding out effect as domestic firms are unable to compete with foreign ones; consequently, they are derived out of the market as shown in Figure (9).

Moreover, there is no or very low spillover effect resulting from FDI in the manufacturing sector; Massoud (2006) in her research concerning the effect of FDI on productivity of the Egyptian manufacturing sector found that there is no backward vertical spillover in all - the 12 analyzed - sub-sectors as foreign affiliates depends on importing their inputs. Forward vertical spillover was found to be negative or insignificant in all sectors except the machinery subsector. Concerning horizontal spillover to domestic firms; all sectors had no significant spillover except three sectors; two had positive productivity spillover to domestic firms - the oil and machinery sectors - and one had negative effect on productivity of domestic firms which is the textile, garment and leather sector. Productivity spillover of the financial sector FDI needs further research as share of FDI to total investment in this sector in Egypt is 64%.

External debt has an insignificant or negative effect on output and employment; this is caused by the uses of external debt that may not be directed to productive uses. It seems that external debt is imposing great constraints on both macro variables because of the limited use of external debt in financing export-oriented activities to create enough foreign currency earnings to service the debt.

Finally, we have to reveal the limitations of this empirical study concerning the use of non-traditional GDP (including six main sectors only), in addition, we do not take into account the spillover that take place between different sectors. Also, the spillover effect of foreign firms on domestic firms in each sector may be examined in future studies.

6. Conclusion

After analyzing the Egyptian GDP and determining the share of the six main sectors (financial, manufacturing, agricultural, service, construction and tourism sectors) in the economy, we found that those sectors represent 65% of GDP during the period 2006-2010. The share of FDI directed to the same sectors is only near 40%, the rest 60% is directed to the petroleum and gas sectors; this mismatch encouraged us to deeply analyze those sectors. To the best of our knowledge, our paper is the first to examine the impact of FDI (Greenfield) and external debt collectively on output and employment levels using sectoral perspective - for each of FDI, output growth and employment - in Egypt during the period 1983-2014.

We used non-traditional view of GDP which includes the output of the six specified sectors only. Our analysis was conducted in three stages; aggregate, individual sector and panel analysis. The ARDL model allowed us to spot the light on the transition dynamics from the short to the long-run, also, the sectoral analysis gave us clear view and basis to explain the empirical study results.

The findings suggest that in the long-run; the effect of FDI on output is insignificant or even negative (although it was positive in the short-run), while the effect of external debt is either insignificant or negative in the short and long-run. This may be attributed to the fact that the service sector represents 43% of our non-traditional GDP while FDI as a percentage of total

investment in this sector is only 21%. Moreover, there is no or very low spillover effect resulting from FDI in the manufacturing sector which also suffers from crowding-out effect as domestic firms are unable to compete with foreign ones.

The impact of FDI on employment is positive in the long-run but external debt effect was found to be insignificant because of the limited use of external debt in financing export-oriented activities.

Concerning the sectoral analysis; FDI has a positive effect on sectoral output in all sectors except the construction and service sectors where the effect was insignificant. The effect of FDI on employment is positive in all sectors except the tourism sector (according to the individual sector time series analysis) but in the short-run it has a positive effect only in the agriculture and construction sectors (according to the panel data model) as those sectors are labor incentive.

Therefore, the government has to face the crowding-out problem that hamper the positive effect of FDI to continue in the long-run. This can be either by offering technical support to domestic firms in order to be able to compete with foreign firms or by expanding R&D spending especially in the manufacturing sector. Also, as the study results reveal that external debt has negative effect on output in the long-run, it is important not to depend on external debt as an easy way to get capital inflows, however, concentration should be directed to investment either domestic or foreign. It is important to enhance domestic investment and to become more open to link with foreign firms in order to benefit from the spillover effect resulting from FDI.

Since the bulk of FDI coming to Egypt is directed to the petroleum and gas sectors, more incentives must be given to foreign investors to direct their investments into other important sectors, in addition to improving infrastructure and institutional framework.

This research presents a step forward in literature that concentrates on basic economic sectors in Egypt; future work may include all economic sectors in addition to taking into account inter-relationship between sectors.

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Appendix I

Table 1: Portfolio Flows to Egypt 1998-2012

	Portfolio inflows(US\$)	percent change
1998	-160000000	-131.10%
1999	657800000	-511.13%
2000	269000000	-59.11%
2001	39200000	-85.43%
2002	-216900000	-653.32%
2003	36800000	-116.97%
2004	26100000	-29.08%
2005	729400000	2694.64%
2006	501900000	-31.19%
2007	-3198900000	-737.36%
2008	-673600000	-78.94%
2009	393000000	-158.34%
2010	1724400000	338.78%
2011	-711300000	-141.25%
2012	-983400000	38.25%

Source: World Bank, World Development Indicators Database.

Table 2: ADF and Zivot and Andrews Test Results for the Aggregate Variables

Variable	ADF (At level)	ADF (First difference)	Z&A specified break
<i>lnrGDP</i>	Non- Stationary	Stationary	2003
<i>lnemp</i>	Stationary	--	
<i>lnrFDI (stock)</i>	Non- Stationary	Stationary	2008
<i>lnrdominv</i>	Non- Stationary	Stationary	1998
<i>lnnext</i>	Non- Stationary	Stationary	1992
<i>K/L</i>	Non- Stationary	Stationary	2008

Source: Author's calculations using eviews.

Table 3: Stepwise LS (dependent variable: lnrGDP)

Variable	Coefficient
lnrFDI	-0.104
lnrdominv	0.09*
lnemp	1.23***
lnnext	-0.14***
Constant term	-1.8
R2	97.9%
Prob.F-statistic	0.00000
Durbin Watson	1.02

Note: in this estimation we used dummy variables to account for stationary variables with break and the dummy of fdi was significant (the year 2008 was chosen as break by z&A test)

Source: Author's calculations using eviews.

Table 4: Bounds Tests for the Existence of Cointegration (growth model):

F-statistics	10 % Critical values	
	I(0)	I(1)
3.2615	2.2	3.09

Table 5: ARDL Cointegrating and Long-run Form (lnRGDP is the dependent variable):

	ARDL (1, 2, 1, 0, 0).
Long-run Coefficients	
lnrFDI	0.14
lnrdominv	-0.03
lnemp	0.48
lnrext	-0.388**
Constant Term	
C	6.64
Speed of Adjustment	
φ	-0.38***
Short-run Coefficients	
$\Delta \ln rFDI_t$	0.14*
$\Delta \ln rFDI_{t-1}$	-0.168*
$\Delta \ln rdominv_t$	0.194***
$\Delta \ln emp_t$	0.12
$\Delta \ln rext_t$	-0.1119**

Notes: ***significance level 1%, **significance level 5%, *significance level 10%

Source: Author's calculations using eviews.

Table 6: Stepwise LS (dependent variable: lnemp):

Variable	Coefficient
LNRFDI_LE_T_ST	0.28***
K_L	-0.055***
LNREXT_LE	-0.0778***
Constant term	8.6***
R2	99.4%
Prob.F-statistic	0.00000
Durbin Watson	1.1

Note: lnrdominv was removed from the model by stepwise LS.

Source: Author's calculations using eviews.

Table 7: Bounds Tests for the Existence of Cointegration (employment model):

F-statistics	5% Critical values	
	I(0)	I(1)
25.9	2.79	3.67

Table 8: ARDL Cointegrating and Long-run Form (lnemp is the dependent variable):

	ARDL(1, 0, 0, 2)
Long-run Coefficients	
lnrFDI	0.27***
lnrext	-0.037
K/L	-0.046***
Constant Term	
C	8.3***
Speed of Adjustment	
φ	-0.38***
Short-run Coefficients	
$\Delta \ln rFDI_t$	0.11***
$\Delta \ln rext_t$	-0.005
$\Delta K/L_t$	-0.0699***
$\Delta K/L_{t-1}$	0.014**

Notes: ***significance level 1%, **significance level 5%, *significance level 10%

Table 9: ADF and Zivot and Andrews Test Results

	Financial	Construct-ion	Agriculture	Manufacturing	Services	Tourism
lnrGDP	1997	2007	Stationary with trend	Stationary with trend	2009	Stationary with trend
Ln emp	2008	2008	2008	2009	Stationary at level	1997
lnrFDI	2008	Stationary	Stationary with trend	2009	2009	1991
lnrwage	Stationary at level	1995	Stationary at level	Stationary at level	2009	Stationary at level

Source: Authors' calculations using Eviews software. Since there is no consensus on which version (intercept only or intercept and trend) is preferable for Z&A test, we used the one with the lowest p-value.

Table 10: Effect of FDI on Sectoral Output Growth (Dependent Variable: Sectoral Output (lnOutput))

	Financial	Construct-ion	Services	Manufacturing	Agriculture	Tourism
lnrFDI_st	0.26**	insig	insig	0.1046**	0.074**	0.118*
LnEMP	1.7**	0.558***	1.44***	0.949***	0.697***	4.9***
Genrol.				0.01***	insig	0.03***
edugdp	insig	insig	insig			
INF		insig	insig	0.0078***		insig
EXPR			-0.023***	-0.008***	insig	0.047***
lnpop						
govcr	0.131***	0.021*			0.017**	
lnrwage	-0.73***					
Durbin Watson	1.8	1.14	1.05	1.52	1.4	1.4
R2	96.38%	96.4%	80.2%	98.6%	95.5%	93.9%

Source: Authors' calculations using Eviews software, ***significance level 1%, **significance level 5%, *significance level 10%, "insig" accounts for insignificant.

Table 11: Effect of FDI on Sectoral Employment (Dependent Variable: lnEMP):

	Financial	Construct-ion	Services	Manufacturing	Agriculture	Tourism
lnrFDI_st	.075***	0.156***	0.013***	0.107***	0.107***	insig
lnOUTPUT	0.14***	1.12***	insig	0.4***	insig	0.06**
Genrol.	insig	insig	0.009***	insig		insig
edugdp					insig	
INF					0.007***	insig
EXPR				0.003	insig	
lnpop						
govcr	-0.04***					
lnrwage	0.36***	insig	-0.19***	insig	insig	0.19***
Durbin Watson	2.3	1.33	1.1	2.3	1.7	1.5
R2	99.4%	97%	96%	98.3%	96.3%	85.7%

Notes: ***significance level 1%, **significance level 5%, *significance level 10%.

Table 12: Panel Unit Root IPS Test

	Raw variable T-bar	Demeaned variable T-bar
lnrgdp	-0.8421	-1.6759
Δ Lnrgdp (first difference)	-5.1382***	-6.0706 ***
lnrFDI	-1.8	-3.8
Δ lnrFDI	-5.2***	-6.6***
K/L	-0.9	-1.6
Δ K/L	-6.8***	-7.8***

Source: Authors' calculations using Stata software, ***significance level 1%, **significance level 5%, *significance level 10%

Table 13: Panel ARDL Results (Dependent Variable: lnRGDP)

	ARDL (1, 2, 3, 2, 1)
Long-run Coefficients	
lnRFDI	-0.17***
lnrdominv	0.39***
Lnemp	0.64***
lnrext	-0.2***
Speed of Adjustment	
ϕ	-0.297***
Short-run Coefficients	
Δ lnRFDI	0.1657*
Δ RFDI _{t-1}	-0.055
Δ lnrdominv	-0.24
Δ lnrdominv _{t-1}	0.23
Δ lnrdominv _{t-2}	-0.06
Δ Lnemp	0.06
Δ Lnemp _{t-1}	-0.06
Δ lnrext	-0.17
Constant Term	
C	0607***

Source: Author's calculations using stata. ***, **, * indicate significance at the 1%, 5% and 10% levels respectively. Note that coefficient without star is insignificant.

Table 14: Panel ARDL Results (Dependent Variable: lnemp)

	ARDL(1,2,1,1)
Long-run Coefficients	
lnrFDI	0.3235***
Lnrext	0.056
K/L	-0.096**
Speed of Adjustment	
ϕ	-0.127***
Short-run Coefficients	
Δ lnrFDI	0.0639***
Δ lnrFDI _{t-1}	0.015
Δ lnrext _t	-0.0428*
Δ K/L _t	-1.9**
Constant Term	
C	0.717***

Source: Author's own calculations using stata. ***, **, * indicate significance at the 1%, 5% and 10% levels respectively.

Table 15: The Share of GDP, FDI, Employment and Foreign Participation in Each of the Six Sectors (1983-2014)

	financial	manufacturing	construction	services	agricultural	tourism	
GDP Share	8%	22%	6%	43%	18%	3%	100%
Share of each sector in total							100%
FDI	23%	34%	10%	15%	8%	9%	
Emp share	10%	12%	8%	37%	31%	2%	100%

Note: these percentages is calculated based on six sector aggregates, no other sectors are included

Source: Author's own calculations using data from CAPMAS and GAFI.

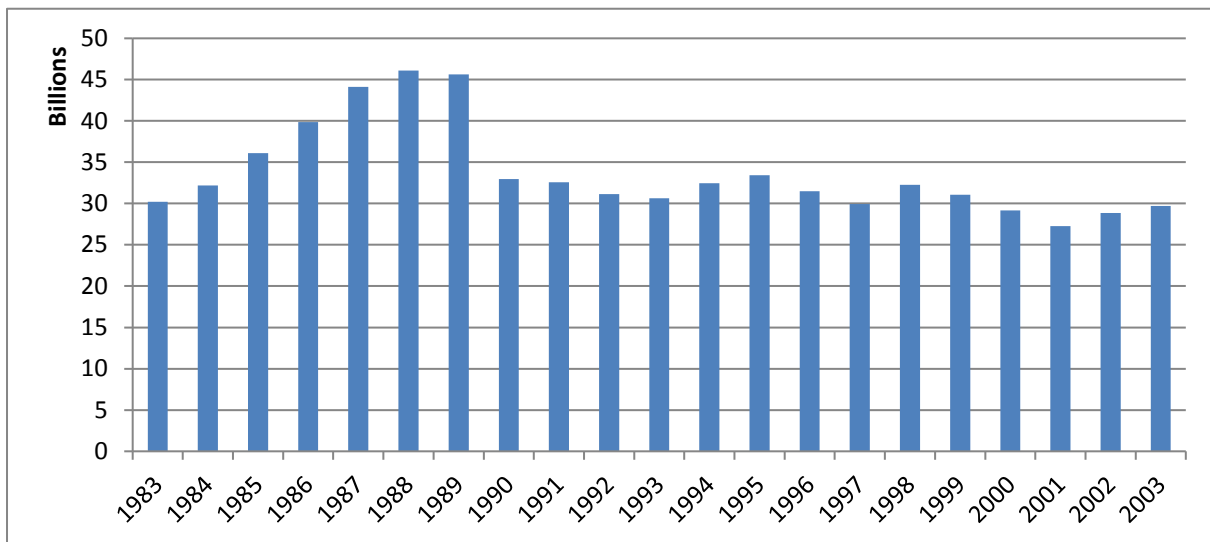
Table 16: The Percent of FDI to Total Investment in each Sector (1983-2014)

	financial	manufacturing	construction	services	agricultural	tourism
Percent of FDI to TINV	64%	27%	21%	21%	37%	16%

Source: Author's own calculations using data from GAFI.

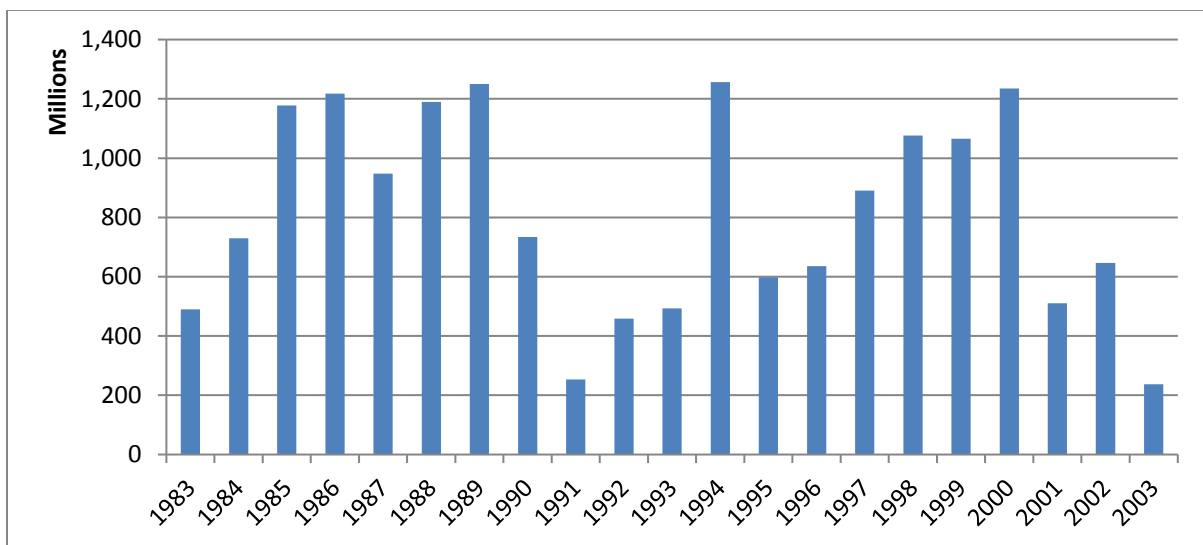
Appendix II

Figure 1: External Debt Stocks, total (current US\$) (1983-2003)



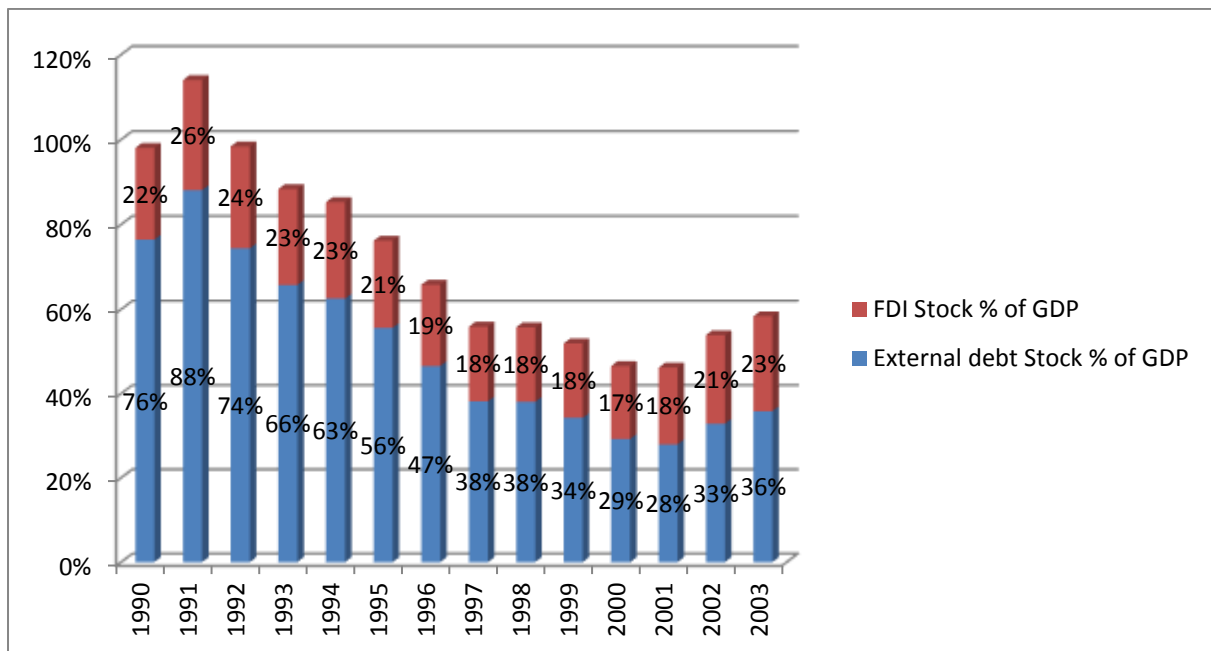
Source: World Bank, World Development Indicators Database.

Figure 2: FDI, Net Inflows (current US\$) (1983-2003)



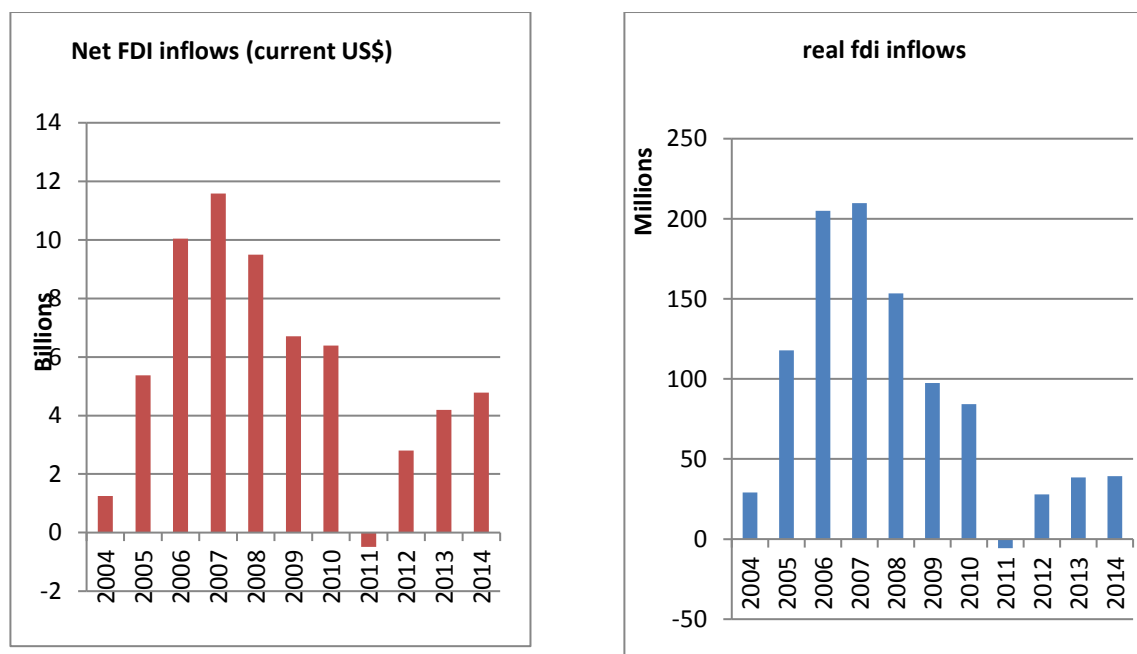
Source: World Bank, World Development Indicators Database.

Figure 3: Stock of FDI and External Debt as Percentage of GDP (1990-2003)



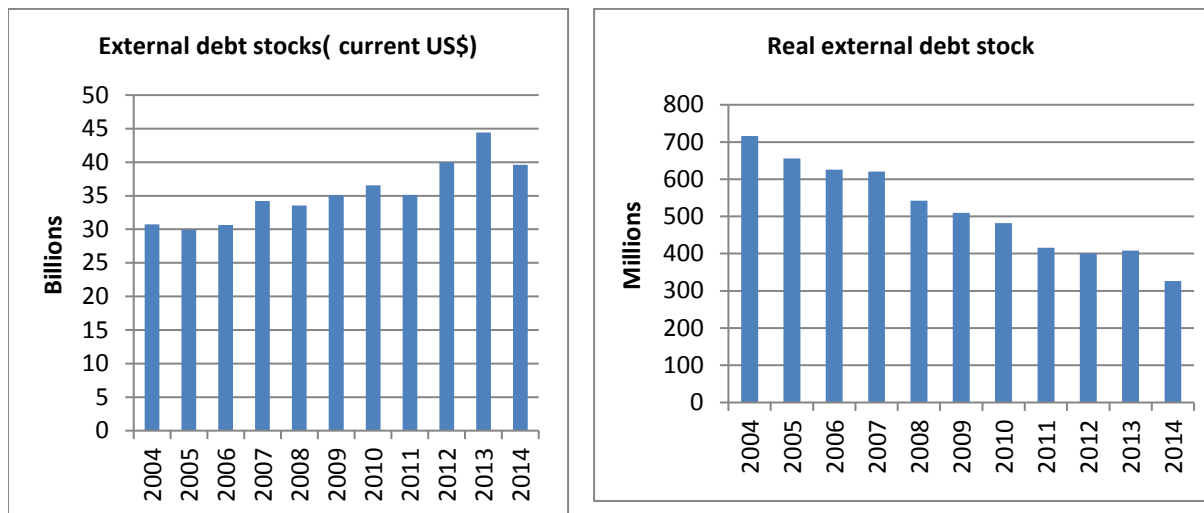
Source: World Bank, World Development Indicators Database.

Figure 4: FDI Inflows in nominal and real terms (2001-2014)



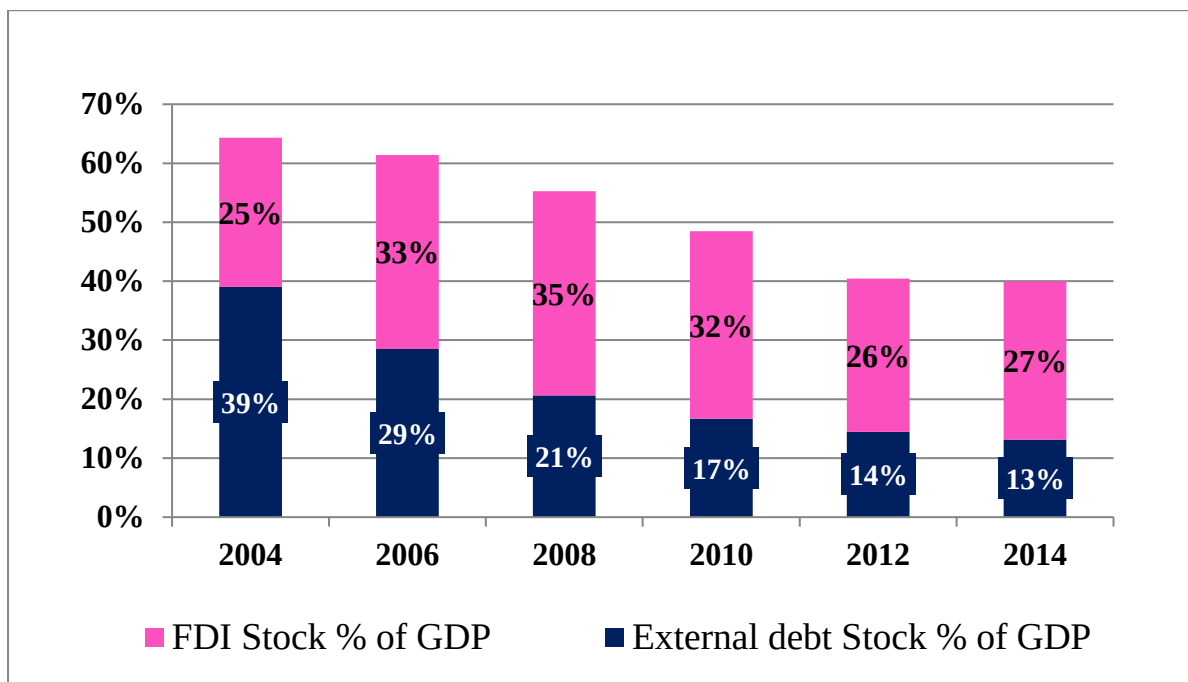
Source: World Bank, World Development Indicators Database.

Figure 5: External Debt Stock in Nominal and Real Terms (2001-2014)



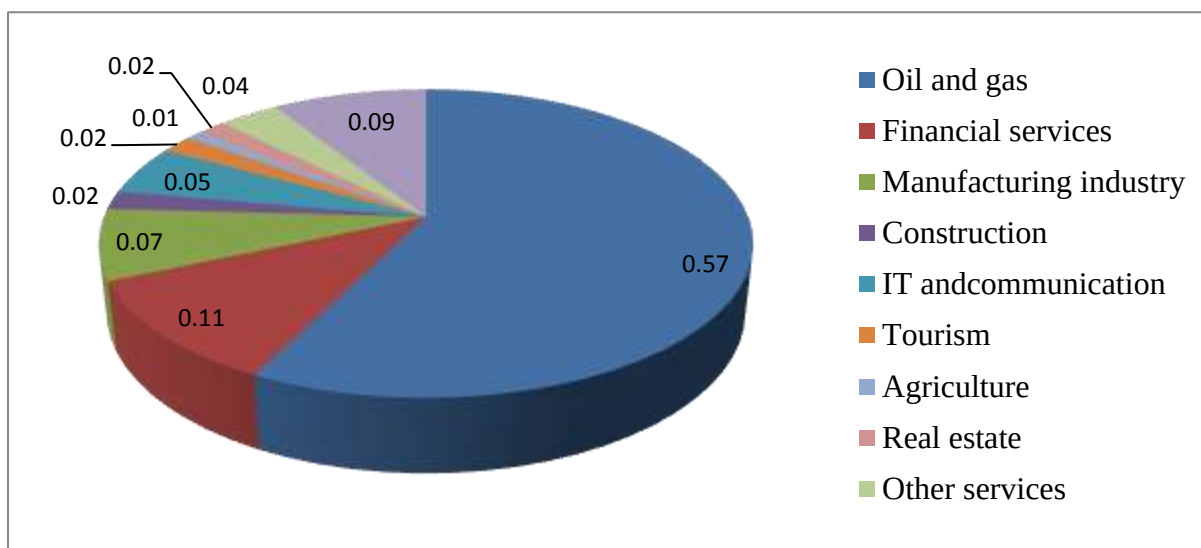
Source: World Bank, World Development Indicators Database.

Figure 6: Stock of FDI and External Debt as Percentage of GDP (2004-2014)



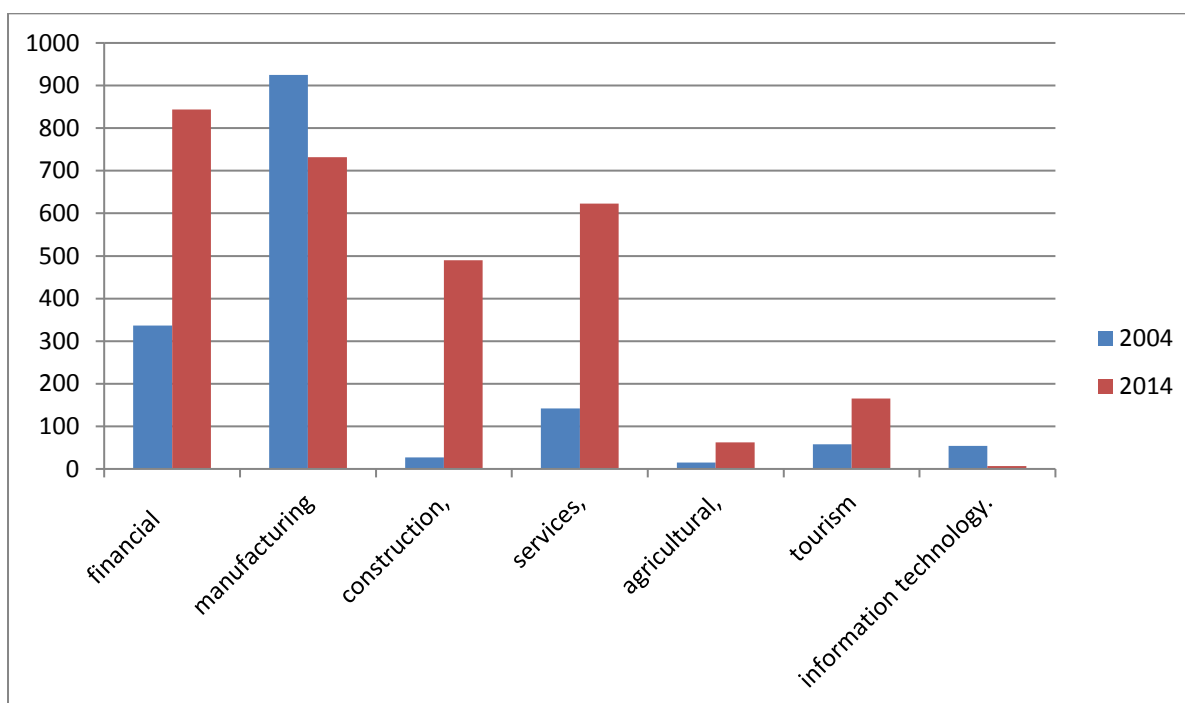
Source: World Bank, World Development Indicators Database.

Figure 7: Sectoral Distribution of Inward FDI into Egypt (2006-2010)



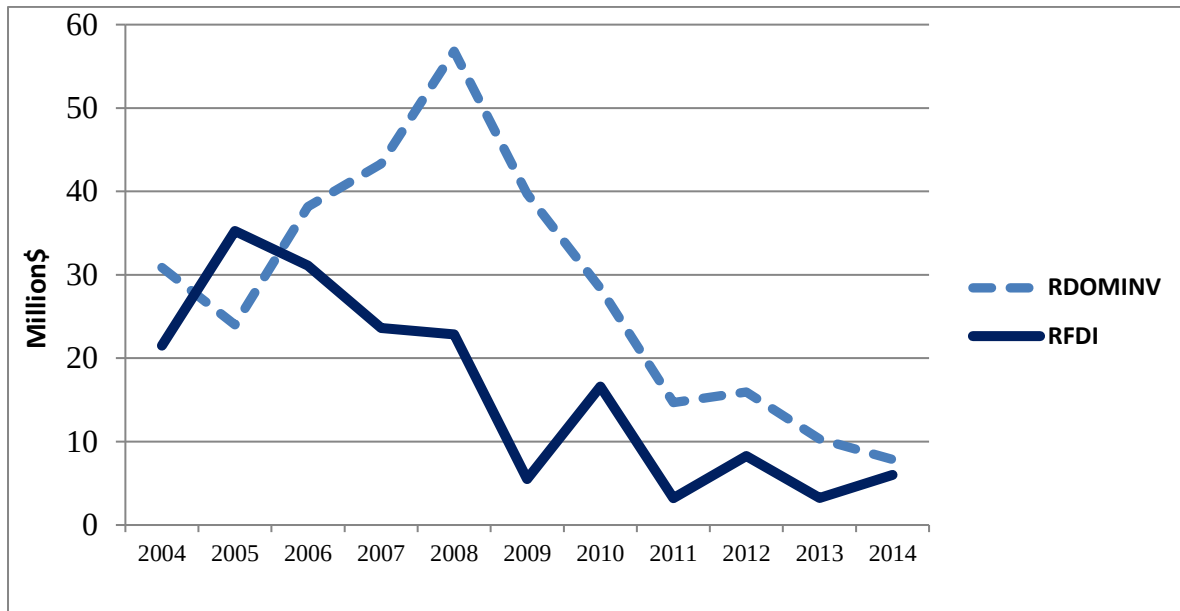
Source: Central Bank of Egypt (CBE)

Figure 8: The Sectoral Composition of Non-Petroleum Green-field Investment (value in million dollar)



Source: General Authority for Investment and Free Zones (GAFI)

Figure 9: Domestic Investment & FDI directed to Manufacturing Sector (2004-2014)



Source: General Authority for Investment and Free Zones (GAFI)