Linking FDI inflows to economic growth in North African countries

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Abstract

This paper tries to examine the interrelationship between FDI inflows and the economic growth for three African economies, namely, Tunisia, Morocco, and Egypt during 1985–2011. Our analysis, which is based on a simultaneous equations model, reveals that in overall terms a mutually promoting two-way linkage between FDI and economic growth exists in these countries. Using the generalized method of moments (GMM), we find that the two-way linkage between FDI inflows and economic growth has been verified in all three economies , i.e., high level of foreign direct investment inflows had accelerated economic growth and high economic growth in these economies does send positive signals to prospective foreign investors.

JEL classification: G20 ; H54 ; C36.

Keywords: Economic growth; FDI inflows; GMM-estimator; North African countries.

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1. Introduction

Foreign Direct Investment (FDI) has been considered as one of the major factors underlying the economic growth in a number of developing countries. In developing countries, policies in favor of FDI have been introduced since the early 1980s. Among them, Tunisia, Morocco and Egypt exhibited similarities in economic structure and policies. For example, all three economies had followed export oriented, development strategy and had accumulated significant foreign reserves from trade surplus and experienced higher rates of domestic investment over the past two decades. In addition, liberalization of the domestic financial system and financial reform has been undergone in these nations recently. This offers a superb sample to be examined the role of the foreign direct investment in economic growth processes. That is, it is interesting to investigate the relationship between FDI inflows and economic growth in Tunisia, Morocco, and Egypt.

In the early 80s, research on the determinants of economic growth has attracted new interest among economic researchers. Theories of endogenous growth have stimulated research that aimed to identify the main factors explaining differences in economic growth rates between economies[1].

There is a large literature on international investments effects on economic growth. Detailed in surveys of the literature by Edwards (1998) and Baldwin (2003) suggest that there is a broad consensus that investment is good for economic growth. Such research has shown that the accumulation of foreign capital is one of the main determinants of economic growth[2]. Some empirical studies confirm positive economic growth from FDI inflows (e.g., Borensztein et al., 1998 ; 2008; Chakrabarti, 2001; Schiff and Wang, 2008), but others find negative or no impacts (e.g., Duasa, 2007 ; Pradhan, 2009). In the case of the three selected countries, studies focus on analyzing the linkage between FDI inflows and economic growth are limited (e.g. Abu-Bader and Abu-Qarn, 2008 ; Haddad and Harrison, 1993 ; Soltani and Ochi, 2012). The majority of these researches have used a single equation model treating the relationship between economic growth and FDI inflows (see,,

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[1] See for example, Romer (1986) and Lucas (1988 : 1993) for details.
[2] See for example, De Mello (1997: 1999) ; Duasa (2007) and Pradhan (2009) and Marino (2002) for an interesting survey.

Soltani and Ochi, 2012). Then, in most cases, one has to look at separate works to find out if or not there is a significant link between FDI inflows and economic growth.

Based on an annual data from three developing countries, namely, Tunisia, Morocco, and Egypt during 1995–2012, we used in this study as an investigate techniques the simultaneous equations based on structural modeling. The model allows examining at the sometime the interrelationship between economic growth and foreign direct investment inflows. Specifically, this study employed a simultaneous system of equations to test two-way linkages between FDI and economic growth.

The rest of the paper is organized as follows. Section 2 briefly discusses the literature review that focuses on the link between FDI inflows and economic growth. This section also contains an overview of selected countries experiences with FDI and economic growth. Section 3 describes the used data and the model specification. Section 4 presents the main results. Lastly, the concluding remarks are presented in section 5.

2. Literature review

2.1. FDI inflows and economic growth : a synthesis

The theorists of endogenous growth highlight the role of human capital in attracting foreign investment in developing countries. This literature suggests that foreign direct investment promotes economic growth through technology diffusion[3]. Then, research and development activities undertaken by Multinational corporations, that are the vehicle of FDI, also contribute to human capital growth in host countries and thus enable their economies to grow in the long run (Blomstrom and Kokko, 2001).

Recent empirical studies have used endogenous growth models to investigate the relationship between FDI and economic growth in developing countries. Based on the following periods 1970–1979 and 1980–1989, Borensztein et al. (1998) investigate the effect of FDI on economic growth. They have used a model where economic growth is determined by FDI, government expenditure, domestic investment, human capital, inflation rate and institutions. This model is estimated by two

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[3] See for example, Romer 1986 and Lucas 1988 for details.

stage least squares (2SLS). They found that FDI inflows positively and significantly affect economic growth and FDI and domestic investment were complementary.

Borensztein et al. (1998), using an endogenous growth highlighted the role played by FDI inflows in economic growth. In this model, it appears that the adoption of new technologies generated by the FDI and the presence of a qualified human capital in the host country are two determinants of economic growth. In addition, using panel dataset that covers 61 provinces of Vietnam from 1996–2005, Anwar and Nguyen (2010) examined the impact of FDI inflows on economic growth. They suggest that the impact of foreign direct investment on economic growth in Vietnam will be larger if more resources are invested in education and training, financial market development and in reducing the technology gap between the foreign and local firms. Berthelemy and De´murger (2000) employed a simultaneous equations model involving 24 Chinese provinces for the period 1985–1996. They found that FDI inflows play an important role in promoting provincial economic growth.

Using panel data from 84 for the period 1970–1999, Li and Liu (2005) examined the relationship between FDI and economic growth. They found that FDI inflows and economic growth became significantly complementary to each other. Moreover, they show that FDI not only directly promotes economic growth but also, indirectly, through its interaction with other variables (e.g. human capital and technology gap, etc.).

Although these studies provide ample evidence of a relationship between FDI and economic growth in developing countries, few studies have considered the role of FDI in promoting economic growth in the region of North Africa[4]. By making use of data for the period 1975–2009, Soltani and Ochi (2012) considered the causal relationship between FDI and economic growth in Tunisia. In addition, the two-way linkage between FDI inflows and economic growth in which FDI involves economic growth and, in turn, economic growth is viewed as a tool to attract FDI has not yet been studied. This study attempts to fill this insufficiency in the existing literature.

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[4] Soltani and Ochi, 2012 points out that the countries of North Africa have not benefited enough from their proximity to Europe to attract FDI and to increase exports. As such, most countries seek to attract FDI through their attractive stocks. In this sense the attraction has become an explicit objective of economic policies.

Based on an annual data from Tunisia, Morocco, and Egypt for the period 1985–2011, this study attempts to empirically examine the two-way linkage between FDI inflows and economic growth in these three countries.

2.2. An overview of selected countries experiences

The three countries—Tunisia, Morocco, and Egypt—selected for our analysis exhibited similarities in economic structure and policies. Yet these three countries have exhibited a certain degree of similarity in their patterns of economic development and growth. All have export-oriented market-based economies; all reflect common economic aspirations with much emphasis on economic growth; and all have dualistic economies were the majority of populations living in an agricultural and rural sector. Moreover, they all have pursued economic development and growth through international trade and investment, and over the past three decades have changed their policies considerably. In the objective to attract more investment, they all made their rules and regulations of FDI less restrictive. The main sources of their FDI inflows are the European Union (EU) and the United States (U.S).

Since the late 1970s, the foreign economic policy has changed moderately in the three countries. In Tunisia, restrictions and barriers to foreign investments were either modified or removed with trade liberalization in 1986. From 1991 to 1995, FDI in Tunisia doubled, from $126 million to $256 million (Murphay, 1999). This doubling coupled with new and effective internal policies that were previously outlined, allowed Tunisia to aggressively foster internal infrastructural development. By 2009, FDI has grown to nearly $1.6 billion dollars and now represents 3% of total Tunisia GDP. More recently, other countries, including Morocco and Egypt, have begun aggressively court FDI and are starting to match Tunisian's success in attracting outside investors.[5] In Morocco, the GDP share of the gross FDI inflows has grown from an average of 0.61% in the 1970s, to 0.67% in 1980s, reaching 2.17% in the 1990s. FDI inflows can be explained by the first positive effect of Structural Adjustment Program (SAP) adopted in 1983 under the aegis of the IMF and of the World Bank and the adoption of new policies as regards trade and foreign investment. In Egypt, The economic reform was initiated in 1991 within the context of stabilization and structural adjustment programs. The government has implemented a number of reform measures and has announced concrete plans to restructure the

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[5] World Bank, Tunisia's Global Integration (washnigton, D.C. : World Bank, 2009)

financial sector, adjust regulations, enhance trade liberalization, and privatize most state-owned enterprises. Egypt is well placed to attract additional foreign investment given the success of its stabilization program and the strength of its economic recovery. In 1999, UNCTAD reports that Egypt was one of the two recipient countries for FDI in Africa. Its share was 29%. FDI in Egypt has shown an average rate of growth of two to five percent per year since 1989 and, by 1995, total FDI in Egypt was approximately US$ 3.53 billion.

Overall, changes in investment and foreign trade policies of the three countries seem to have been conditioned by how well their economies did perform.

3. Model specification and data

The objective of this paper is to analyze the interrelationship between economic growth and the stock of foreign direct investment. These two variables are in fact endogenous. As mentioned earlier, most existing literature generally opine that FDI stock promotes GDP growth. On the other hand, however, a number of other studies indicate that rapid GDP growth rate is the most important determinants of the country's FDI inflows (Lv et al., 2010; Fung, 2004; and Berthelemy and Demurger, 2000). This implies the existence of a relationship between FDI inflows and GDP. Increased FDI stock promotes GDP growth, and rising GDP as well as high GDP growth rate may in turn attract more FDI.

It is well known that economic growth depends on FDI and others variables (Borensztein et al., 1998; Li and Liu, 2005). Then, it can be argued that the stock of foreign capital depends on GDP and other variables (Anwar and Nguyen, 2010). In this sense, we believe that a simultaneous equations model can yield more appropriate to treat economic growth and foreign direct investment (FDI) as endogenous.

On this basis, we use the following simultaneous equations model in double log forms to investigate the interrelationship between GDP and FDI stock. The two-way linkage between GDP growth and FDI is empirically examined by making use of the following two equations:

$$ln(GDP)_t = \beta_0 + \beta_1 ln(GDP)_t + \beta_2 ln(HC)_t + \beta_3 ln(TOP)_t + \beta_4 ln(PDI)_t + \beta_5 ln(CPI)_t + \beta_6 ln(DF)_t + \mu_t \qquad (1)$$

$$ln(\text{FDI})_t = \pi_0 + \pi_1 ln(\text{GDP})_t + \pi_2 ln(\text{HC})_t + \pi_3 ln(\text{TOP})_t + \pi_4 ln(\text{PDI})_t + \pi_5 ln(\text{INF})_t + \pi_6 ln(\text{COR})_t$$
$$+ \pi_7 ln(\text{RER})_t + \mu_t \qquad (2)$$

Eq. (1), allow examining the impact of the stock of foreign direct investment (FDI) and other variables on economic growth measured by per capita GDP. *FDI* is defined as the FDI inflows per capita. An increase in FDI sock is likely to increase the GDP (Anwar and Nguyen, 2010; Chakraborty and Nunnenkamp, 2008; Gorg and Strobl, 2005; Kahouli and Kadhraoui, 2012 ; Schiff and Wang, 2008). *HC* is a proxy of human capital, measured by tertiary school enrolment. In this context, many studies Blankenau and Simpson (2004) have suggested that human capital play a crucial role on economic growth (e.g. Blankenau and Simpson, 2004; Barro and Salai- Martin, 2004). *TOP* is a measure of the trade openness of the economy, determined by the sum of exports and imports as a proportion of GDP. A higher openness can increase economic growth, however, its effect on economic growth in developing countries can also be negative (e.g., Anawar and Sun, 2011). *CPI* is the consumer price index, an increase in this variable have a negative effect on economic growth (Friedman, 1977). *PDI* is the private domestic investment, measured by the ratio of gross capital formation to GDP. An increase in the private domestic investment will probably have a positive effect on economic growth (e.g., Ang, 2010). *DF* is the financial development, measured by the ratio of private credit to GDP. An increase in the quantity of credit to the private sector will probably have a positive effect on economic growth. Thus, the growth of private credit increases investment and facilitating economic growth (Ang, 2010). μ_t Represents the error terms, β and α are the unknown population coefficients.

Eq. (2) examines the determinants of the stock of foreign direct investments. Where *FDI* refers to the foreign direct investment inflows per capita in the all three selected countries. An increase in GDP per capita will probably increase the stock of FDI (Ang, 2008). Then, the stock of human capital (HC) is likely to positively affect the FDI inflows (Anwar and Sun, 2011). Then*,* Trade openness (TOP) contributes positively to FDI inflows (Ang, 2008). In addition, private investment contributes positively to FDI inflows (Ang, 2010). *INF* is the infrastructure development, it is a major determinant

of FDI inflows in host economies. Many studied have used different proxies to identify the level of infrastructure development. For example, per capita usage of energy by Mudambi (1995), railway transport and a general transportation/urbanization was used as a proxy by Glickman and Woodward (1988), telephones per thousand of population by Asiedu (2002). This work utilizes telephones per hundred of population as a measure of infrastructure development in these three countries. This choice is due to the availability of data. *COR* is the corruption perceptions index[6], it is the measurements of political factors. Corruption can affect FDI directly by tarnishing the perception of stability and quality of an investment potential. When investors believe that there is a high amount of corruption in the host country they are considering, they may see this as an impediment for doing business there. .. to transition economies. They find that countries with a low level of corruption attract more per capita FDI. Finlay, *RER* is the real exchange rate. An appreciation in the real exchange rate (RER) should reduce FDI.[7]

While estimating the two-way linkage between FDI inflows and economic growth, our dataset consists of yearly time series data from 1985 to 2011 which is obtained from International Financial Statistics (IFS) published by the International Monetary Fund, and World Development Indicators (WDI) published by the World Bank. All the variables are transformed into natural logarithmic from for allowing a better regression treatment as most economic time series data are characteristically exponential with respect to time, and a log transformation changes the vertical scale to linear. Furthermore, log transformation makes elasticity calculation easier, as the estimated coefficients are approximate to the percentage changes in the variables.

The above simultaneous equations were estimated by the generalized method of moments (GMM). In the following, we report the results of GMM estimator.

4. Empirical results

1. Descriptive statistics and correlations

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[6] The corruption perceptions index is a composite index ranging from 0 to 10, where 0 denotes the highest level of corruption and 10 denotes the lowest.

[7] Real exchange rate volatility is regarded as an indicator for poor macroeconomic policies that lead to real exchange rate misalignment (Kamin and Rogers, 2000). The relationship between the real exchange rate and foreign investment can be negative.

The empirical results presented in this section are based on simultaneous equations GMM estimation. We estimate the two-way linkage between FDI inflows and economic growth, the others variables were used as instrumental. To do this, we used annual data from Tunisia, Morocco, and Egypt during 1985–2011. All selected variables have been transformed to natural logarithm in order to reduce the scale effect.

The correlations between different variables of the three economies are presented in table 1. The correlation coefficients suggest that the reported regression models will not be seriously distorted by multicollinearity. This table shows that Tunisia and Egypt have higher average of GDP and FDI per capita than Morocco. Although Morocco has achieved higher level of financial development than Tunisia and Egypt. However, Tunisia and Morocco had achieved higher level of openness than Egypt. As for the inflation rate, Morocco had maintained stable price levels. Furthermore, the domestic investment in Tunisia was lower than those in Morocco and Egypt. Finally, the corruption perception index in Tunisia and Egypt was lower than those in Morocco.

This table shows also the correlations between economic growth, FDI inlows and other variables in these three economies. In Tunisia, the correlations between the economic growth and FDI inflows is only 0.31, while the correlations between the economic growth and the other variables are within the range 0.05 to 0.42. However, FDI inflows has a high level of correlation with human capital, infrastructure and corruption perception index. In Morocco, the correlations between the economic growth and FDI inlows is 0.42, while the correlations between the economic growth and othervariables are within the range 0.11 to 0.56. Although FDI inflows has a high level of correlations with human capital, openness and infrastructure. Finally, the correlations between economic growth and all varables in Japan are within the range 0.15 to 0.64. Furthermore, the correlation between FDI inflows and all considered variables are within the range 0.07 to 0.67.

2. Regression results and policy implications

Before estimation, we used the ADF and PP unit-root tests on the stock indices series of different countries in the sample. We find that all series are stationary in level. Table 2 reports the GMM

estimation results for these economies. The last row in each table reports p-values for the Hansen test which cannot reject the null of overidentifying restrictions. That is, the null hypothesis that the instruments are appropriate cannot be rejected. The empirical results presented in this section are based on simultaneous equations GMM estimation. Column (1) reports the economic growth effects of those variables such as the FDI inflows per capita, the human capital, the trade openness, the private domestic investment, the consumer price index, and financial development. Column (2) reports the FDI inflows effects of those variables such as the GDP per capita, the human capital, the trade openness, the private domestic investment, the infrastructure, the corruption perception index, and the real exchange rate.

Table 1
Descriptive statistics and correlations between variables.

	Mean	SD	1	2	3	4	5	6	7	8	9	10
Tunisia												
1 ln GDP	7.71	0.18	1.00									
2 ln FDI	4.39	0.73	0.31	1.00								
3 ln HC	3.15	0.37	0.05	0.58	1.00							
4 ln TOP	4.50	0.10	-0.22	0.39	-0.22	1.00						
5 ln PDI	3.23	0.05	0.42	0.11	0.45	- 0.16	1.00					
6 ln CPI	4.61	0.10	-0.41	-0.12	-0.16	-0.33	-0.19	1.00				
7 ln FD	4.26	0.03	0.19	-0.23	0.27	0.09	0.44	-0.27	1.00			
8 ln INF	2.33	0.25	0.10	0.66	-0.09	0.29	0.55	-0.24	0.25	1.00		
9 ln COR	1.55	0.08	0.34	0.69	0.11	0.11	-0.29	0.11	-0.46	0.04	1.00	
10 ln RER	1.43	0.11	-0.13	-0.41	-0.07	-0.33	-0.15	0.09	-0.22	-0.10	0.13	1.00
Morocco												
1 ln GDP	7.18	0.16	1.00									
2 ln FDI	2.27	2.32	0.49	1.00								
3 ln HC	2.41	0.11	0.11	0.58	1.00							
4 ln TOP	4.19	0.14	-0.35	0.61	0.12	1.00						
5 ln PDI	3.62	0.19	0.56	-0.32	0.56	- 0.33	1.00					
6 ln CPI	3.28	0.08	-0.39	-0.06	0.06	-0.29	-0.31	1.00				
7 ln FD	4.88	0.23	0.23	0.45	0.66	0.24	0.24	- 0.17	1.00			
8 ln INF	2.73	0.40	0.34	0.71	- 0.22	0.55	0.43	-0.35	0.41	1.00		
9 ln COR	1.79	0.11	0.19	0.28	0.33	0.25	-0.29	0.23	0.33	0.11	1.00	
10 ln RER	1.16	0.03	-0.33	-0.38	-0.13	-0.22	0.22	0.17	-0.13	-0.19	-0.23	1.00
Egypt												
1 ln GDP	7.36	0.14	1.00									
2 ln FDI	3.14	1.21	0.54	1.00								
3 ln HC	3.38	0.16	0.20	0.28	1.00							
4 ln TOP	3.90	0.19	0.55	0.67	0.14	1.00						
5 ln PDI	3.95	0.08	0.15	-0.35	0.08	0.12	1.00					
6 ln CPI	4.57	0.34	-0.37	-0.48	-0.36	0.55	-0.19	1.00				
7 ln FD	3.78	0.20	0.23	0.07	0.21	-0.19	0.54	-0.41	1.00			
8 ln INF	1.26	0.41	0.60	0.53	0.44	0.30	0.61	- 0.68	0.31	1.00		
9 ln COR	1.54	0.10	-0.64	-0.33	0.11	0.19	-0.31	0.24	0.73	-0.24	1.00	
10 ln RER	1.59	0.11	-0.19	-0.23	-0.30	-0.23	-0.21	-0.13	-0.05	-0.02	0.19	1.00

Table 2 suggests that FDI is an important determinant of the economic growth in the all selected countries (see column 1, table 2). The estimated coefficient of FDI is significant at 1% level. In other words, one can argue with 99% confidence that increase in FDI in these countries increases economic growth. The finding is consistent with what Soltani and Ochi (2012) had got using Tunisian's data. The human capital variable has a positive and significant effect on economic growth in Morocco, while it is insignificant in Tunisia and Egypt cases. This means investment in education and training contribute positively to economic growth in Morocco. The estimated coefficient of trade openness (OPS) is significantly positive in Morocco, while it is significantly negative in Tunisia and is little or even become negative in Egypt. This results is consistent with what Anawar and Sun (2011) had got, i. e., the effect of trade openness on economic growth in developing countries can also be negative. However, private domestic investment (PDI) is an important determinant of the economic growth in the all selected countries. The estimated coefficient of PDI is significant at 1% and 5% level, respectively in Tunisia and Morocco. The private domestic investment is not a significant factor for accounting for the economic growth over the past two decades in Egypt. One possible reason for these might effects may be due to that private domestic investment did not exhibit dynamic efficiency among this country. The finding is consistent with what Lin, Lee, and Huang (1996) had got using Taiwan's and Korea's data. Furthemore, financial development has a positive and significant effect on economic growth only in the case of Morocco. The estimated coefficient of financial development (FD) is significant at 1% level. In other words, one can argue with 99% confidence that increase in financial development in Morocco increases economic growth. In this case, financial sector should provide sufficient resources by creating new institutions and organizations for the demand of real sector with the progress of economic development (Kar et al., 2011). The analysis highlights the provision of efficient credit and financial services by the financial system may greatly facilitate technological transfer and induce spillover efficiency. Given that evolution of the financial system may affect the speed of technological accumulation and innovations, it is important to develop a sound financial system in order to reap these efficiency gains and achieve sustained economic growth in the long run. To this end, appropriate financial sector reforms may help achieve this purpose (see, Ang,

2008 ; Ang and McKibbin, 2007). It is however interesting to note that the impact of financial development on Tunisian's and Egyptian's economic growth is statistically insignificant. This suggests that the financial sectors of these two economies have perhaps not sufficiently developed yet. Based on the size of the estimated coefficients, it seems that these economies are relatively more sensitive to changes essentially in the stock of domestic and foreign investment.

In addition, table 2 reports also that economic growth is an important determinant of the FDI inflows in the three economies (see column 2, table 2). The estimated coefficient of GDP per capita is significant at 1% level. In other words, one can argue with 99% confidence that increase in economic growth in these countries increases FDI inflows. This suggests that higher economic growth in these economies does send positive signals to prospective foreign investors. Thus, the strong economic growth remains a necessary condition for these countries to attract FDI inflows. The results are in line with the general findings of the literature, including Billington (1999) and Choi (2003), which have consistently found a positive role of economic growth. Because, in countries with stable governments past policies are most useful in predicting the future. This phenomenon has been observed in many countries such as China and India. The human capital (HC) has a positive and significant effect on FDI inflows only in Tunisia and Morocco, while it becomes insignificant in Egypt case. This implies that the level of human capital play an important role to attract more of FDI. However, we remark that, in the Tunisian case, human capital has only an indirect impact on economic growth via its impact on FDI inflows. Furthemore, trade openness has a positive and significant effect on FDI inflows in the case of the three selected economies. The estimated coefficient of trade openness is significant at 1% level. In other words, one can argue with 99% confidence that increase in the degree of openness in these countries increases FDI inflows. The findings are, by and large, in line with that of Chakrabarti (2001) and Asiedu (2002). Hence, the results imply that greater liberalization of the trade sector may be conducive to inward FDI. The estimated coefficient of private domestic investment is positive and statistically significant only in the case of Morocco, implying that FDI

inflows and private domestic investment in Morocco are complements. In other words, increase in private domestic investment increases FDI inflows in Morocco and vice versa. Also, the impact of

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infrastructure (INF) on FDI inflows is positive and statistically significant at 1% level in the all selected countries. This implies that the provision of an adequate infrastructure base is an effective tool for stimulating FDI inflows. This is in line with the findings of other previous researchers such as Wheeler and Mody (1992) that infrastructure; particularly telecommunications infrastructure is a necessary condition for foreign investors to operate successfully.

Table **2**
Simultaneous equations GMM estimation.

Variables	Country					
	Tunisia		Morocco		Egypt	
	(1)	(2)	(1)	(2)	(1)	(2)
Constant	9.344 [a] (4.657)	4.848 [a] (2.532)	6.662 [a] (3.027)	4.442 [a] (2.511)	4.971 [b] (2.664)	3.143 [a] (2.410)
GDP per capita (ln GDP)	-	0.337 [a] (0.191)	-	0.454 [a] (0. 143)	-	0.235 [a] (0. 122)
FDI per capita (ln FDI)	0.125 [a] (0.211)	-	0.191 [a] (0.119)	-	0.237 [a] (2.58)	-
Human capital (ln HC)	0.202 (0.137)	0.197 [b] (0.091)	0.152 [c] (0.132)	0.124 [a] (0. 043)	0.417 (0.41)	0.012 (0.077)
Trade openness (lnTOP)	-0.190 [c] (0.092)	1.462 [a] (0.451)	0.027 (0.018)	1.584 [a] (0. 513)	-0.062 (0.292)	1.926 [a] (0.254)
Private domestic investment (ln PDI)	0.426 [a] (0.087)	0.144 (0.254)	0.243 [b] (1.951)	0.024 [b] (0. 013)	0.177 [c] (0.341)	0.048 (0.090)
Consumer price index (ln CPI)	-0.382 [b] (0.099)	-	-0.339 [a] (0.065)	-	-0.122 (0.053)	-
Financial Development (ln FD)	0.149 (0.171)	-	0.346 [a] (0.303)	-	0.246 (0.251)	-
Infrastructure (ln INF)	-	1.584 [a] (0.214)	-	4.567 [a] (4. 413)	-	0.750 [a] (0. 183)
Corruption index (ln COR)	-	0.631 [a] (8.465)	-	0.012 (0.099)	-	0.421 [a] (0.165)
Real exchange rate (ln RER)	-	-0.061 [b] (0.069)	-	-0.029 [c] (0.085)	-	-0.021 (0.045)
R^2	0.621	0.592	0.846	0.667	0.733	0.618
Hansen test (p-value)	0.151	0.311	0.121	0.451	0.119	0.209

Notes: Numbers in parentheses are standard errors. [a] Significant at the 1% level ; [b] Significant at the 5% level ; [c] Significant at the 10% level.

Then, Ang, (2008) support also that an increase in government spending on infrastructure will probably increase the FDI inlows in host countries. The estimated coefficient of corruption perceptions index (CPI)[8] is statistically significant only in the case of Tunisia and Egypt, while it becomes insignificant in Morocco. The estimated coefficient of CPI is significant at 1% level. This implies the low level of corruption leads to attract more FDI. So, when investors believe that there is a high amount of corruption in the host country they are considering, they may see this as an impediment for doing business there. This provides a wake-up call for policymakers so as to give highest priority to curb corruption as one of the main preconditions to create conducive atmosphere for attracting inward FDI into their economies. This by enhancing good governance and better

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[8] We repeat that the corruption perceptions index (CPI) is a composite index ranging from 0 to 10, where 0 denotes the highest level of corruption and 10 denotes the lowest.

economic institutions including strengthening the effectiveness and predictability of the judiciary, enforceable contracts and the rule of law, drying up the root causes of corruption and rent seeking, and developing an environment where fair and predictable rules form the basis for social and economic interactions. Finally, the estimated coefficient of real exchange rate (RER) is significantly negative in Tunisia and Morocco, while it is insignificantly negative in Egypt. This implies that a depreciation of the real exchange rate (RER) in these tends to raise FDI inflows. Based on the size of the estimated coefficients, it can be argued that FDI inflows is relatively more sensitive to economic growth, human capital, level of opennes, and Infrastructure.

Based on these results, it is clear that economic growth contributes to the of the growth of FDI inflows and growth in FDI inflows making a significant contribution to economic growth in Tunisia, Morocco, and Egypt.

5. Conclusions

The two-way linkage between FDI and economic growth remains an issue of intense debate among researchers. While this debate has provided rich insights into the relationship between FDI inflows and economic growth in a number of developing countries, few empirical studies have considered the case of the region of North Africa. In addition, the two-way linkage between FDI inflows and economic growth in which FDI involves economic growth and, in turn, economic growth is viewed as a tool to attract FDI has not yet been studied in this region.

By making use of recently annual data from Tunisia, Morocco, and Egypt for the period 1985–2011, this study attempts to empirically examine the link between FDI inflows and economic growth and related issues. While focusing on these three economies, unlike most existing studies, this paper utilises a simultaneous equations model estimated by means of the Generalised Method of Moments technique. However, the major findings could be summarized as follows : (1) the two-way linkage between FDI inflows and economic growth has been verified in all three economies , i.e., high level of foreign direct investment inflows had accelerated economic growth and high economic growth in these economies does send positive signals to prospective foreign investors ; (2) private domestic

investment had a positive effects on the all three economies, while the effects of trade openness is negative and insignificant in the tunisian's case ; (3) financial development had a positive and significant effects on economic growth in Morocco ; (4) human capital had a positive and significant effects on FDI inflows in Tunisia and Morocco, but had insignificant effect on Egypt; (5) the level of opennes and infrastructure had significant and positive effects on FDI inflows in all three economies. (6) Thecorruption perceptions index had a significant effects only in the cases of Tunisia and Egypt, while it is insignificant in Morocco.

Based on the results presented in this paper, it can be argued that there is a need for further financial sector reforms in these three countries. In a recent study Cooray (2011) has suggested that, government can play an important role in financial sector development. They would benefit from an increase in private domestic investment and in spending infrastructure. Thus, the provision of efficient credit and financial services by the financial system may greatly facilitate technological transfer and induce spillover efficiency. Given that evolution of the financial system may affect the speed of technological accumulation and innovations, it is essential to develop a sound financial system in order to reap these efficiency gains and achieve sustained economic growth in the long run. Human capital growth is making a sizeable contribution to both economic growth and FDI inflows in Morocco and hence polices that would boost the stock of human capital are highly desirable. Finally, the serious effect of corruption provides a wake-up call for policymakers so as to give highest priority to curb corruption as one of the main preconditions to create conducive atmosphere for attracting inward FDI into their economies. This by enhancing good governance and better economic institutions including strengthening the effectiveness and predictability of the judiciary, enforceable contracts and the rule of law, drying up the root causes of corruption and rent seeking, and developing an environment where fair and predictable rules form the basis for social and economic interactions.

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