African Development Review
Revue africaine de développement

African Development Review, Vol. 28, No. 1, 2016, 64–74

Does Economic Freedom Enhance the Impact of Foreign Direct Investment on Economic Growth in North African Countries? A Panel Data Analysis

Nahed Zghidi, Imen Mohamed Sghaier and Zouheir Abida*

***Abstract*:** This article investigates the causal interactions between foreign direct investment (FDI), economic freedom and economic growth on a panel of four North African countries (Tunisia, Morocco, Algeria and Egypt), over a 5-year period from 1980 to 2013. Using the System Generalized Method of Moments (GMM) in a panel data analysis, we found strong evidence of a positive link between FDI and economic growth. We also found that economic freedom appears to be working as a complement to FDI and that the effect of FDI is more pronounced in the presence of the economic freedom variable. This means that the countries which promote greater freedom of economic activities benefit more from the presence of multinational corporations (MNCs).

1. Introduction

The impact of FDI on economic growth has been discussed quite extensively in the literature. The growing interest in this area of research is neglected in the shift of the emphasis among policymakers in the developing countries towards attracting more FDI. Since the early 1980s, many countries (including the developing ones) have lifted a lot of restrictions imposed on FDI flows. The United Nations Conference on Trade and Development (UNCTAD) shows that, in 2013, 59 countries adopted 87 policy measures affecting foreign investment. National investment policymaking remained geared towards investment promotion and liberalization. At the same time, the overall share of regulatory or restrictive investment policies further increased from 25 to 27 per cent for 2012–2013 (UNCTAD, 2014). According to UNCTAD (2001, 2014), global FDI inflows rose from $57 billion in 1982 to $1,271 billion in 2000 and reached a record high of $1,452 billion in 2013. In fact, over the past few decades, the growth rate of world FDIs has exceeded the growth rates of both world trade and GDP. However, FDI inflows are not uniform across countries as only countries are able to attract more FDI than the others. The motivation for increased efforts to attract more FDI stems from the expectation of an overall positive impact of FDI resulting from productivity gains, technology transfer and spillover, exposure of domestic firms to new processes, managerial skills and know-how, enhancements to employee training, development of international production networks, and broader access to markets. Moreover, FDI is not as volatile as the other short-term flows, and hence, it is less destructive (World Bank, 1999).

Although the theoretical literature expects that FDI inflows can transmit great advantages to the host country, empirical studies on the FDI-growth link have provided conflicting results (see Herzer *et al*., 2008). Some studies in this literature found that FDI exerts a positive impact on economic growth in the recipient countries (De Mello, 1999; Chong *et al*., 2010; Gui-Diby, 2014), while others found no such evidence (Ericsson and Irandoust, 2001) or even a negative impact (Moran, 1998) on economic growth (see also the survey by Gorg and Greenaway, 2004). Drawing on the ambiguous and inconclusive results of the FDI-growth relationship, the literature identified the absorptive capacity of the host country as the key explanatory variable for the varied conclusions.[1] Specifically, the effect of FDI on economic growth may not be strong in countries with poor absorptive capacity. In other words, host countries must have initial conditions to absorb the benefits from FDI. Apart from this important finding, several intervening factors that are important for FDI spillovers have also been recognized in earlier literature, such as the quality of human capital, the deeper domestic financial markets, and the trade policy.

In order to better understand the nature of the relationship between FDI and economic growth, this paper focuses on the recent literature that showed the importance of institutions in the processes of growth. In particular, our study underlines the importance

*University of Sfax, Tunisia; e-mails: zghidi.nahed@gmail.com; medsghaier.imen@gmail.com; zouheir.abida@gmail.com.

of economic freedom (EF, hereafter) in mediating FDI spillovers to help answer these questions. Our argument proceeds from the fact that the lack of EF can limit the firm's ability to absorb and internalize the new technology from MNCs and slows economic growth in the host countries. However, countries moving toward greater EF tend to achieve higher rates of per capita GDP growth over time.

In this paper, we used the EF index developed by the Fraser Institute to establish the relationship between EF and economic growth. The index is a measure of institutional quality that presents insight into the characteristics of an environment conducive to prosperity. A look at the index components reveals various reasons to expect that countries with a higher level of EF will have greater absorptive capacity, and thus allow them to reap greater benefits from FDI.

First, there is a general agreement in the literature that less regulation would actually promote economic growth. It is well known that a free and open market provides greater opportunities for entrepreneurs to try out new ideas with new markets. It also encourages firms to engage in risky businesses such as FDI-related activities, in search for potentially higher returns for their investment. On the other hand, if the market is extensively regulated, it adversely affects the allocation of resources in such an environment.

Second, employment laws may also have implications for FDI spillovers. If the laws for hiring and firing employees are less restrictive, spillover effects through labor mobility are more likely to occur because workers who have previously worked with MNCs are more able to transfer their knowledge and experience of new technologies to local firms (Fosfuri *et al*., 2001). Third, the protection of property rights is another element of EF. According to Javorcik (2004), countries that provide better protection of property rights are expected to benefit more from the presence of MNCs because they can attract FDI of a higher technological content. Finally, freedom of exchange across borders may help domestic firms to penetrate foreign markets for exporting purposes (Aitken *et al*., 1997).

This study is particularly significant for the North Africa region following recent political unrest and social tensions in many of these countries. Indeed, FDI contributes to economic growth in North Africa, which in turn generates additional revenues for the governments and the populations of the region through fiscal policies and job creation. Additionally, institutional quality and better governance tend to amplify the positive impacts of FDI on economic growth in the region. It is therefore important for governments in this region to continue investing in social infrastructures while improving the quality of their institutions and their governance because doing so will help them avoid the type of unrest we have witnessed recently.

The contribution of this paper to the literature is threefold. First, we believe that this study is the first to analyze the relationship between EF, FDI and economic growth in the North African region. Second, in terms of policy implications, the results of this research will guide policy makers in designing policies aimed at better directing external capital, such as FDI, towards sectors with the highest effect on economic growth. Third, compared to previous studies, this paper employs a more advanced dynamic panel econometric technique that formally addresses country-specific effects and simultaneity bias. This method relies on the System GMM estimator, which has a number of advantages over the cross-section estimator.

The main purpose of this paper is to examine the role of EF in mediating the impact of FDI on economic growth on a panel of four North African countries, namely Tunisia, Morocco, Algeria and Egypt, over a 5-year period from 1980 to 2013. Our dynamic panel regression analyses show that FDI positively and significantly affects economic growth in North Africa. This study also highlights the positive complementarities between the index of EF and FDI. This means that the countries which promote greater freedom of economic activities significantly benefit from the presence of MNCs.

The remainder of the paper is structured as follows. Section 2 provides a detailed literature review. Section 3 describes the used data and the empirical methodology. Section 4 presents the empirical results. Section 5 presents the concluding remarks and policy implications.

2. Review of Literature

2.1 Review of Theoretical Literature

FDI made by MNCs is considered as one of the key elements in the growth process for many countries. According to Dunning (1993), MNCs have been linked to superior technologies, patents, trade secrets, brand names, management techniques and marketing strategies. They are also known to be among the biggest spenders on research and development activities (Borensztein *et al*., 1998). Moreover, they hire a large share of professional and technical workers and undertake substantial efforts in the education of workers (Fosfuri *et al*., 2001). Once they have invested and set up a subsidiary in the host country, some of the

benefits linked to MNCs may not be completely internalized and thus spill over to domestic firms, contributing to the growth of the domestic economy. Additionally, FDI is a useful source of capital for host countries to finance current account deficits. Actually, it is considered less volatile than other financial flows, such as portfolio investment, because MNCs apply a long-term investment strategy. According to Aitken *et al*. (1997), FDI promotes exports of host countries by raising domestic capital for exports, helping transfer of technology and new products for exports, and facilitating access to new and large foreign markets. Local firms may learn with the practice of MNCs or MNCs may transfer cost-free technology and know-how to local suppliers in order to improve the quality of inputs (Rodriguez-Clare, 1996). Entrance of MNC is generally complemented by foreign technology which ascends the competition pressure in the host country (Blomström *et al*., 1994).

Some studies, however, cast doubt on the optimistic view that FDI generates positive spillovers for local firms. They have showed the adverse socioeconomic effects of EF (i.e., investment freedom) that include linkages, asset bubbles, foreign dominance, economic instability, and massive inflows of foreign workers, among others. For instance, Krugman (2000) indicated that foreign investors can take advantage of liquidity constrained domestic investors' fire sales of assets during financial crises. In this situation, foreigners are less efficient than domestic investors, only because of the foreigners' superior cash position. Similarly, Hausmann and Fernández-Arias (2001) argued that a recent rise of FDI indicates that markets are working poorly, that institutions are inadequate and that risks are high. Residents are selling their companies because they do not have the markets and institutions that allow them to grow. The presence of asymmetric information could also distort the level of investment. In this context, Razin *et al*. (1999) noted that foreign investors' asymmetric information advantage might lead to over-investment. With regard to this issue, Stiglitz (2000) showed that without first putting into place an effective regulatory framework, full capital account liberalization will bring instability to a developing country due to free flows of short-term speculative capitals.

Previous studies have pointed out that FDI spillovers do not occur automatically, but depend on the host countries' absorptive capacity which is largely determined by multiple factors, such as the level of per capita income, human capital, trade openness, and financial market development. The absorptive capacity hypothesis has been tested in a number of different studies with mixed results. For instance, Blomström *et al*. (1994) found that whether FDI can help contribute to the economic growth depends on the host country's developing level. Balasubramanyam *et al*. (1996) argued that more open economies are likely to both attract a higher volume of FDI and promote more efficient utilization thereof than closed economies. Moreover, their estimates indicated that FDI contributes more to domestic growth than domestic investment, suggesting that it is indeed a vehicle of international technology transfer. Quazi (2007) concluded that a host country should formulate its FDI strategies by focusing on EF components in order to attract more FDI inflows into the country. Such efforts will likely foster a healthy environment to court FDI, and also nurture the ingredients necessary for economic. Recently, Alfaro *et al*. (2010) found that an increase in FDI leads to higher growth rates in financially developed countries compared to those observed in financially poorly developed ones. Their results also suggested the importance of absorptive capacities for the effect of FDI on economic growth.

It has also been argued that the adoption of new technologies requires skilled labor able to use these new technologies. On this matter, Borensztein *et al*. (1998) found that the effect of FDI on economic growth depends on the level of human capital in the host country. In fact, it has positive growth effects only if the level of education is higher than a given threshold. This conjecture is further confirmed by Xu (2000) who argued that technology transfer from FDI contributes to productivity growth in more developed countries but not in less developed ones because the latter lack adequate human capital.

While there has been no consensus so far on the relationship between FDI and economic growth, evidence on the role of institutions in economic growth is more compelling. North (1991) defined institutions as 'the humanly devised constraints that structure political, economic, and social interactions. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights)'. The author further observed that institutions provide the incentive structure of an economy which shapes the direction of economic change towards growth, stagnation or decline. In short, institutions affect the security of property rights, prevalence of corruption, distorted or extractive policies, and thereby influence investments in human and physical capital, and promote economic growth.

2.2 Review of Empirical Literature

In fact, many studies show that EF exert a major effect on cross-country differences in both per capita income and economic growth (see, for example, De Haan *et al*., 2006; Azman-Saini *et al*., 2010; Compton *et al*., 2011; among others). On this point, Barro (2000) showed that secure property rights improve growth performance not only by encouraging investments, but also by

enhancing the productivity of investments. Meanwhile, Demetriades and Law (2006) found that more finance without sound institutions may not succeed in delivering long-run economic growth in low-income countries. Rodrik *et al*. (2004) argued that governance is a factor that explains cross-country income differences, pointing out that institutions matter more than openness and geography in determining income level. Acemoglu *et al*. (2001) used the protection from the expropriation risk index measured by the International Country Risk Guide as a proxy for institutional quality. They showed that differences in institutions and state policies are at the root of large differences in income per capita across countries. Hall and Jones (1999) investigated cross-country differences in economic performance based on variations in inputs (e.g., capital and human capital). They found that the large variation in output per worker across countries is only partially explained by differences in physical capital and educational attainment. They also argued that the differences in capital accumulation, productivity and, therefore, output per worker, are determined by differences in institutions and government policies.

A smaller group of researchers has investigated the relationship between EF and economic growth. Economists agree that EF, along with political freedom and civil liberties, is one of the pillars of a country's institutional structure. According to Heritage Foundation (2004), EF has been defined as 'the absence of government coercion or constraint on the production, distribution, or consumption of goods and services beyond the extent necessary for citizens to protect and maintain liberty itself'. Economists have long accorded greater importance to freedom to choose and supply resources, competition in business, free trade with others and secure property rights as representing important ingredients needed for achieving economic growth. Several empirical research, however, have shown the importance of EF in explaining cross-country differences in economic growth. For example, Bengoa and Sanchez-Robles (2003) examined the interplay between EF, FDI and economic growth using panel data for a sample of 18 Latin American countries. Their results showed a positive contribution of EF to FDI inflows. Economic growth was also found to be positively related to FDI. They also suggested that human capital, economic stability and liberalized markets may be helpful in attracting long-term capital flows. Azman-Saini *et al*. (2010) found that FDI does not have an independent impact on economic growth and that the positive effect is only possible in countries with high levels of EF. In the same trend, Compton *et al*. (2011) used the measure of EF representing the following areas: size of government, takings and discriminatory taxes, and labor market freedom, and found the positive association between EF and economic growth for US states (but not all components of EF affect growth equally). Fabro and Aixalá (2012) found that property rights, civil liberties and political stability were all relevant institutional factors. They showed that the three dimensions of institutional quality are important for economic growth either through a better allocation of resources or, indirectly, through the stimulation of investment in physical and human capital. More recently, Nawaz (2015) has found that the improvement of institutional quality leads to acceleration in economic growth.

Over the past decade, numerous studies have found evidence of the importance of institutions in influencing FDI inflows in the African countries. Mlambo (2005) concluded that countries in southern Africa need to reduce regulations, enforce property rights, improve bureaucracy and reduce corruption if they are to increase FDI inflows. Anyanwu (2006) indicated that, although prospects of increased domestic, foreign direct and private portfolio investment in Africa were awarded on inadequate resource mobilization, uncertainty, corruption, low human capital development, reliance on primary products and exports, poor governance, and inadequate infrastructure all contributed to the rise and furthered the entrenchment of these constraints. Moreover, Gelb *et al*. (2007) found that the most fundamental constraints in Africa (such as macroeconomic stability, electricity, access to finance) appear to be most binding at low levels of income. Then, as a country develops, firms have to deal with a number of problems caused by weak governance and low administrative and bureaucratic capacity (corruption, level of taxation, quality of administration). Finally, as a country moves up to a higher-income status, labor regulation becomes a more serious determinant of the business environment, largely because the state has a stronger capacity to implement it. Diop *et al*. (2010) contributed the low GDP per capita growth of Economic Community of West African States countries to poor governance and weak institutions. They argued that weak institutions and poor governance have made it difficult for citizens of countries within the sub-region to attain a higher standard of living. Atangana Ondoa (2013) presented some indicators of governance, such as political stability and regulator quality, ultimately exerting a positive effect on economic growth in Africa. The author argued that the fight against corruption can further promote economic growth in countries rich in natural resources and applying democratic principles. Foster-McGregor (2013) concluded that internationally trading firms, foreign owned firms and firms with better access to sources of external finance tend to be more likely to invest and to invest more, with little role for indicators of property rights in influencing the investment decisions. More recently, Anyanwu and Yameogo (2015) argued that West African countries must increase their national incomes by deepening macroeconomic and structural reforms to increase their competitiveness, dismantle existing structural bottlenecks to private and public investment, scale up investments in hard and soft infrastructure, and increase productivity, especially in agriculture.

3. Data and Empirical Methodology

3.1 Data

This paper considers a sample of four North African countries, namely Tunisia, Morocco, Algeria and Egypt. The choice of the selected countries for this study is primarily dictated by the availability of reliable data over the sample period. The panel covers the period 1980–2013, and is divided into five non-overlapping five-year periods.[2] The dependent variable is economic growth, measured as the growth rate of real GDP per capita at 2005 USD prices. With the exception of the institutional variable (EF), the main variable of interest (FDI) and the other control variables are obtained from the World Development Indicators (WDI) database (World Bank, 2015). The Index of EF is taken from Gwartney *et al*. (2015).

According to the World Bank, FDI are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP. It is expected that the sign of the coefficients associated with FDI would be positive as spillover effects may have been observed in North African countries.

The EF index from the Fraser Institute is used to measure the freedom of economic activities in a country. Higher indexes are associated with smaller governments (Area 1), stronger legal structure and security of property rights (Area 2), access to sound money (Area 3), greater freedom to exchange with foreigners (Area 4), and more flexible regulations of credit, labor, and business (Area 5). According to the survey of De Haan *et al*. (2006), which focuses on the empirical studies that used this EF index, greater EF stimulates economic growth. Thus, a positive coefficient is expected.

Our baseline model includes the explanatory variables common to most growth regressions found in the literature (all except Initial GDP per capita are averaged over each 5-year period):

- Initial GDP per capita (log): log of real GDP per capita lagged by one 5-year period. A negative coefficient is expected, indicating the existence of conditional convergence among countries.
- Investment (% GDP), defined as the ratio of gross fixed capital formation to GDP. A positive coefficient is expected, as greater investment shares have been shown to be positively related to economic growth (Mankiw *et al*., 1992).
- Primary school enrollment. Greater enrollment ratios lead to greater human capital, which should be positively associated to economic growth (Gemmell, 1996).
- Population growth. Higher population growth leads to lower GDP per capita growth. Thus, a negative coefficient is expected (Aisen and Veiga, 2013).
- Trade openness, measured as the percentage of imports plus exports in GDP. Assuming that openness to international trade is beneficial to economic growth; a positive coefficient is expected (Chang and Mendy, 2012).

3.2 Empirical Methodology

The purpose of our empirical analysis is to examine if EF plays an important role in influencing the effects of FDI on economic growth in North Africa. To this end, we employ a specification that is broadly similar to others (e.g., Azman-Saini *et al*., 2010; Aisen and Veiga, 2013). We consider the following model:

$$y_{i,t} = \alpha y_{i,t-1} + \beta_1 FDI_{i,t} + \beta_2 EF_{i,t} + \beta_3 X_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t} \quad (1)$$

Equation (1) can also be alternatively written with the growth rate as a dependent variable as:

$$Growth_{i,t} = y_{i,t} - y_{i,t-1} = (\alpha - 1) y_{i,t-1} + \beta_1 FDI_{i,t} + \beta_2 EF_{i,t} + \beta_3 X_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t} \quad (2)$$

The subscript ' t ' represents one of these 5-year periods, while i represents the country, y is the logarithm of the real GDP per capita, FDI is foreign direct investment, EF is the economic freedom index and X is the matrix of control variables described in

the previous section, μ_t is a time specific effect, η_i is an unobserved country-specific fixed effect and $\varepsilon_{i,t}$ is the error term. Equation (2) forms the basis for our estimation. $(\alpha - 1)$ is the convergence coefficient.

While FDI has the potential to affect economic activity through a host of channels, in a second set of regressions, we examine one specific link between FDI and economic growth, specifically the one working through EF. The hypothesis we would like to test is whether the level of EF in the host country affects FDI on economic growth. To this end, we add an interaction term constructed as the product of FDI and the EF (i.e., FDI*EF) to Equation (2) as an additional explanatory variable, apart from the standard variables used in the economic growth equation. To ensure that the interaction term does not proxy for FDI or the level of EF, both of the latter variables were included in the regression independently. If the coefficient on the interaction term is positive and significant, it implies that the marginal effect of FDI on economic growth depends on the level of EF.

The regression to be estimated is the following:

$$Growth_{i,t} = (\alpha - 1)y_{i,t-1} + \beta_1 FDI_{i,t} + \beta_2 EF_{i,t} + \beta_3 (FDI_{i,t}.EF_{i,t}) + \beta_4 X_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t} \tag{3}$$

This paper applies the GMM panel estimator developed by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). There are two main reasons for choosing this estimator. The first is to control for country-specific effects, which cannot be done with country-specific dummies due to the dynamic structure of the regression equation. Second, is to control for a simultaneity problem caused by the possibility that some of the explanatory variables may be endogenous with growth or other dependent variables.

Following Arellano and Bond (1991), Equation (1) can be transformed into a first-difference equation to eliminate country-specific effects as follows:

$$y_{i,t} - y_{i,t-1} = \alpha(y_{i,t-1} - y_{i,t-2}) + \beta_1 (FDI_{i,t} - FDI_{i,t-1}) + \beta_2 (EF_{i,t} - EF_{i,t-1}) + \beta_3 (X_{i,t} - X_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \tag{4}$$

To address the possible simultaneity bias of the explanatory variables and the correlation between $(y_{i,t-1} - y_{i,t-2})$ and $(\varepsilon_{i,t} - \varepsilon_{i,t-1})$, Arellano and Bond (1991) proposed that the lagged levels of the regressors are used as instruments. It is valid under the assumptions that the error term is not serially correlated and the lag of the explanatory variables are weakly exogenous. This strategy is known as Difference GMM estimation and the moment conditions can be listed as follows:

$$\mathrm{E}\left[y_{i,t-s}.(\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \quad \text{for } s \geq 2;\ t = 3, ..., T \tag{5}$$

$$E\left[FDI_{i,t-s}.(\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \quad \text{for } s \geq 2;\ t = 3, ..., T \tag{6}$$

$$E\left[FF_{i,t-s}.(\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \quad \text{for } s \geq 2;\ t = 3, ..., T \tag{7}$$

$$E\left[X_{i,t-s}.(\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \quad \text{for } s \geq 2;\ t = 3, ..., T \tag{8}$$

If the variables are persistent, however, their past values convey little information about their future changes, making their lagged value a weak instrument for their differenced series (Acemoglu and Robinson, 2008). This may be the case for the institution variables which may lead to a biased estimation of parameters in small samples and asymptotically larger variance. Arellano and Bover (1995) suggested a combination of the differenced Equation (4) and level Equation (1). Blundell and Bond (1998) showed that this estimator is able to increase the efficiency via its reduction in biases, and imprecision characterized the Difference GMM estimator, especially the above-mentioned weak instrument problem. Arellano and Bover (1995) and Blundell and Bond (1998) proposed a System GMM estimator as follows. In addition to the moment conditions of Equations (5)–(8), the authors proposed that the System GMM uses the following moment conditions:

$$E\left[(y_{i,t-s} - y_{i,t-s-1}).(\eta_i + \varepsilon_{i,t})\right] = 0 \quad \text{for } s = 1 \tag{9}$$

$$E\left[(FDI_{i,t-s} - FDI_{i,t-s-1}).(\eta_i + \varepsilon_{i,t})\right] = 0 \quad \text{for } s = 1 \tag{10}$$

$$E\left[(EF_{i,t-s} - EF_{i,t-s-1}).(\eta_i + \varepsilon_{i,t})\right] = 0 \text{ for } s = 1 \quad (11)$$

$$E\left[(X_{i,t-s} - X_{i,t-s-1}).(\eta_i + \varepsilon_{i,t})\right] = 0 \quad \text{for } s = 1 \quad (12)$$

The consistency of the System GMM estimator depends on the validity of the assumption that the error term does not exhibit serial correlation and on the validity of the instruments. By construction, the test for the null hypothesis of no first-order serial correlation should be rejected under the assumption that the error is not serially correlated; but the test for the null hypothesis of no second-order serial correlation, should not be rejected. We use two diagnostics tests proposed by Arellano and Bover (1995) and Blundell and Bond (1998), the Sargan test of over-identifying restrictions, and whether the differenced residuals are second-order serially correlated. If the null hypothesis of both tests cannot be rejected, this would indicate that the model is adequately specified and the instruments are valid. The results from this estimation procedure are reported in Table 1.

4. Empirical Results

The empirical results are presented in Table 1. Column (1) reports a preliminary analysis on the effects of FDI and EF on economic growth. Column (2) presents the coefficient estimates obtained from the baseline specification, which used an interaction term constructed as a product of FDI and EF.

The results in Column (1) clearly indicate that the estimated coefficient on FDI is statistically significant at the 5 percent level, which suggests that FDI plays a positive role in boosting the economic growth of North African countries. This result is consistent with some studies in the FDI-growth literature (e.g. Chong *et al*., 2010; Gui-Diby, 2014). Meanwhile, the EF

Table 1: The growth effect of FDI and economic freedom

Variable	(1)	(2)
Initial GDP per capita	–0.0124***	–0.0176***
	(–3.722)	(–4.043)
Foreign Direct Investment	0.0159**	0.021**
	(2.141)	(2.31)
Economic Freedom	0.0068**	0.0075**
	(2.18)	(2.523)
Population growth	–0.271***	–0.231***
	(–5.037)	(–4.113)
Primary school enrollment	0.0002*	0.0004**
	(1.951)	(2.565)
Investment (% GDP)	0.0154**	0.02**
	(2.236)	(2.513)
Foreign Direct Investment Economic Freedom*	–	0.0071*
		(1.675)
Trade openness	0.0283*	0.0303**
	(1.811)	(3.651)
Constant	0.027*	0.013*
	(1.65)	(1.742)
R-squared	0.76	0.82
AR(2) test *(p*-value*)*	0.673	0.651
Sargan test *(p*-value*)*	0.716	0.491

Notes: The dependent variable is the growth rate of real GDP per capita. System GMM estimations for dynamic panel data models. Sample period 1980–2013. AR(2) is a test of second order residual serial correlation. *J*-test is the Hansen over identification test. *t*-statistics are in parentheses.
*, **, and *** indicate statistical significance at 10%, 5% and 1% levels, respectively.

coefficient carries a positive sign and is statistically significant at conventional levels, implying that economic growth is stronger when EF is high because it makes investment more productive. This finding is consistent with the survey conducted by De Haan *et al*. (2006) and Azman-Saini *et al*. (2010) who concluded that EF is crucial for economic growth. Importantly, our results also confirm that the greater the EF the more it enhances the advantage of foreign capital inflows. It should be noted that the coefficients of the core variables considered in the equation enter the regression equation with the correct sign and are significant at the 10 percent significance level or better. Additionally, the estimated regression passed both specification tests. The null hypothesis of no second-order serial correlation cannot be rejected at the 5 percent level. The regression is not plagued by simultaneity bias as the orthogonality conditions cannot be rejected at the 5 percent level, as indicated by Hansen's test. This suggests that the equation is adequately specified and the instruments employed in the analysis are valid.

Next, Column (2) shows the regression results based on interaction specification using an interaction term between FDI and the EF index (FDI*EF). In this specification, we relied on the interaction term to establish the contingency. If the term is positive and significant, this implies that the impact of FDI on economic growth increases with EF. The first thing to note is that the interaction term turns out to be positively signed and statistically significant at the 10 percent level. This result implies that a better contribution of FDI to economic growth requires taking into account the interrelationship and the complementarity between EF and FDI. The *p*-values of second-order serial correlation and Hansen's over-identification tests indicate that the model is adequately specified. This finding is consistent with recent studies which found that the impact of FDI on economic growth depends on the absorptive capability of the host countries. Therefore, this finding supports the view that an improvement in EF is needed to facilitate FDI spillovers.

We introduced the level of initial GDP per capita (the natural logarithm) as an independent variable according to the conditional convergence hypothesis. The coefficient of initial GDP per capita shows the expected negative sign and is highly significant, indicating a convergence of per capita income across countries as proposed in the growth theories. This result corroborates the work of Barro and Sala-i-Martin (1997). The effect of the other variables in the regression is consistent with the standard growth regression results. Investment and school enrollment ratios[3] have positive and statistically significant coefficients, indicating that greater investment and better education promote economic growth. The coefficient of trade openness is positive and statistically significant, which is consistent with a positive effect of trade openness on economic growth. Finally, the population growth has the expected negative coefficient.

5. Conclusions and Policy Implications

FDI is viewed as one of the main channels of technology transfer across borders. As a result, many countries compete against each other to attract more FDI. This paper draws from recent literature that underlines the importance of EF for growth process. Specifically, it explores the role of EF in attracting FDI inflows. It argues that FDI is seeking quality domestic institutions because a good institution is able to create a more attractive work environment for investors in terms of lower operating costs and higher productivity.

In order to test the hypothesis, this study uses the System GMM panel estimator and data from four countries of North Africa, over a 5-year period from 1980 to 2013. From the empirical analysis, we drew three important conclusions. First, the coefficient measuring the impact of the FDI on economic growth is positive and significant, indicating that FDI affects economic growth in a positive way. Second, EF is found to be an important factor for economic growth for the countries considered. Finally, the effect of FDI on economic growth is contingent on the level of EF in the host countries. This means that the countries which promote greater freedom of economic activities significantly profit from the presence of MNCs.

In this context, countries should weigh the cost of policies aimed at attracting FDI and capital flows versus those that seek to improve the level of EF. These two policies need not be incompatible. A better level of EF not only attracts foreign capital but also allows host countries to maximize benefits from foreign investments. Countries should implement policies and procedures that guarantee enough transparency for potential investors before using other measures for attracting higher levels of FDI. However, the building of more effective institutions will be a long and arduous process. In some countries, it may be politically difficult for governments to make a range of reforms in the short run but in the long run they can lead to tremendous economic benefits.

Notes

1. Absorptive capacity is defined as the ability of a firm to recognize the value of new external information, assimilate it, and apply it to commercial ends (Cohen and Levinthal, 1990). This concept is different from learning-by-doing where firms become more practiced and efficient at what they are already doing. With absorptive capacity a firm may acquire outside knowledge that will permit it to do something different and thus requires double loop, generative learning.
2. Most panel studies on growth cycles are based on five-year averages as the time unit to eliminate the business cycle effect. Additionally, in this study we lacked annual data for some of the variables of interest. As such this did not allow us to use annual data. Due to data availability, the final period covers from 2010 to 2013.
3. The results are virtually the same when secondary enrollment is used instead of primary enrollment. Since we have more observations for the latter, we opted to include it in the estimations reported in this paper.

References

Acemoglu, D., S. Johnson and J. Robinson (2001), 'The Colonial Origins of Comparative Development: An Empirical Investigation', *American Economic Review*, Vol. 91, pp. 1369–401.

Acemoglu, D. and J. Robinson (2008), 'Persistence of Power, Elites, and Institutions', *American Economic Review*, Vol. 98, pp. 267–93.

Aisen, A. and F. J. Veiga (2013), 'How Does Political Instability Affect Economic Growth?', *European Journal of Political Economy*, Vol. 29, pp. 151–67.

Aitken, B., G. Hanson and A. Harrison (1997), 'Spillovers, Foreign Investment, and Export Behavior', *Journal of International Economics*, Vol. 43, pp. 103–32.

Alfaro, L., A. Chanda, S. Kalemli-Ozcan and S. Sayek (2010), 'Does Foreign Direct Investment Promote Growth? Exploring the Role of Financial Markets on Linkages', *Journal of Development Economics*, Vol. 61, pp. 242–56.

Anyanwu, J. C., (2006), 'Promoting of Investment in Africa', *African Development Review*, Vol. 18, No. 1, pp. 42–71.

Anyanwu, J. C., and N. D. Yameogo (2015), 'What Drives Foreign Direct Investments into West Africa? An Empirical Investigation', *African Development Review*, Vol. 27, No. 3, pp. 199–215.

Arellano, M. and S. Bond (1991), 'Some Tests of Specification for Panel Data: Monte Carlo Evidence with an Application for Employment Equations', *Review of Economic Studies*, Vol. 58, pp. 277–97.

Arellano, M. and O. Bover (1995), 'Another Look at the Instrumental-Variable Estimation of Error-components Models', *Journal of Econometrics*, Vol. 68, pp. 29–52.

Atangana Ondoa, H. (2013), 'Gouvernance et croissance économique en Afrique', *African Development Review*, Vol. 25, No. 2, pp. 130–47.

Azman-Saini, W. N. W., A. Z. Baharumshah and S. H. Law (2010), 'Foreign Direct Investment, Economic Freedom and Economic Growth: International Evidence', *Economic Modelling*, Vol. 27, No. 5, pp. 1079–89.

Balasubramanyam, V., M. Salisu and D. Sapsford (1996), 'Foreign Direct Investment and Growth in EP and IS Countries', *Economic Journal*, Vol. 106, pp. 92–105.

Barro, R. J. (2000), 'Rules of Law, Democracy, and Economic Performance', in G. P. O'Driscoll, K. R. Holmes and M. Kirkpatrick (eds.), *2000 Index of Economic Freedom*, Heritage Foundation and the Wall Street Journal, Washington DC and New York.

Barro, R. J. and X. Sala-i-Martin (1997), 'Technological Diffusion, Convergence, and Growth', *Journal of Economic Growth*, Vol. 2, No. 1, pp. 1–27.

Bengoa, M. and B. Sanchez-Robles (2003), 'Foreign Direct Investment, Economic Freedom and Growth: New Evidence from Latin America', *European Journal of Political Economy*, Vol. 19, No. 3, pp. 529–45.

Blomström, M., R. Lipsey and M. Zejan (1994), 'What Explain Developing Country Growth?' in W. Baumol, N. Nelson and E. Wolff (eds.), *Convergence and Productivity: Cross-National Studies and Historical Evidence*, PN Oxford University Press, PL Oxford.

Blundell, R. and S. Bond (1998), 'Initial Conditions and Moment Restrictions in Dynamic Panel Data Models', *Journal of Econometrics*, Vol. 87, pp. 115–43.

Borensztein, E., J. De Gregorio and J. W. Lee (1998), 'How Does Foreign Investment Affect Economic Growth?', *Journal of International Economics*, Vol. 45, pp. 115–35.

Chang, C. and M. Mendy (2012), 'Economic Growth and Openness in Africa: What Is the Empirical Relationship?', *Applied Economics Letters*, Vol. 19, No. 18, pp. 1903–7.

Chong, C.-K., A. Z. Baharumshah, Z. Yusop and M. S. Habibullah (2010), 'Private Capital Flows, Stock Market and Economic Growth in Developed and Developing Countries: A Comparative Analysis', *Japan and the World Economy*, Vol. 22, pp. 107–17.

Cohen, D. and W. Levinthal (1990), 'Absorptive Capacity: A New Perspective on Learning and Innovation', *Administrative Science Quarterly*, Vol. 35, No. 1, pp. 128–52.

Compton, R. A., D. C. Giedeman and G. A. Hoover (2011), 'Panel Evidence on Economic Freedom and Growth in the United States', *European Journal of Political Economy*, Vol. 27, pp. 423–35.

De Haan, J., S. Lundstrom and J. Sturm (2006), 'Market-oriented Institutions and Policies and Economic Growth: A Critical Survey', *Journal of Economic Surveys*, Vol. 20, pp. 157–91.

De Mello, L. R. (1999), 'Foreign Direct Investment in Developing Countries and Growth: A Selected Survey', *Journal of Development Studies*, Vol. 34, No. 1, pp. 1–34.

Demetriades, P. and S. Law (2006), 'Finance, Institutions and Economic Development', *International Journal of Finance and Economics*, Vol. 11, pp. 245–60.

Diop, A., G. Dufrénot and G. Sanon (2010), 'Is Per Capita Growth in Africa Hampered by Poor Governance and Weak Institutions? An Empirical Study on the ECOWAS Countries', *African Development Review*, Vol. 22, No. 2, pp. 265–75.

Dunning, J. (1993), *Multinational Enterprises and the Global Economy*, Addison-Wesley, Wokingham.

Ericsson, J. and M. Irandoust (2001), 'On the Causality between Foreign Direct Investment and Output: A Comparative Study', *International Trade Journal*, Vol. 15, pp. 1–26.

Fabro, G., and J. Aixalá (2012), 'Direct and Indirect Effects of Economic and Political Freedom on Economic Growth', *Journal of Economic Issues*, Vol. 46, pp. 1059–80.

Fosfuri, A., M. Motta and T. Ronde (2001), 'Foreign Direct Investment and Spillovers through Workers' Mobility', *Journal of International Economics*, Vol. 53, pp. 205–22.

Foster-McGregor, N. (2013), 'On the Determinants of Investment in Sub-Saharan African Manufacturing Firms', *African Development Review*, Vol. 25, No. 4, pp. 573–86.

Gelb, A., V. Ramachandran and G. Turner (2007), 'Stimulating Growth and Investment in Africa: from Macro to Micro Reforms', *African Development Review*, Vol. 9, No. 1, pp. 26–51.

Gemmell, N. (1996), 'Evaluating the Impacts of Human Capital Stocks and Accumulation on Economic Growth: Some New Evidence', *Oxford Bulletin of Economics and Statistics*, Vol. 58, pp. 9–28.

Gorg, H. and D. Greenaway (2004), 'Much Ado about Nothing? Do Domestic Firms Really Benefit from Foreign Direct Investment?', *World Bank Research Observer*, Vol. 19, pp. 171–97.

Gui-Diby, S. L. (2014), 'Impact of Foreign Direct Investments on Economic Growth in Africa: Evidence from Three Decades of Panel Data Analyses', *Research in Economics*, Vol. 68, pp. 248–56.

Gwartney, J., R. Lawson and J. Hall (2015), *Economic Freedom of the World*, Annual Report, The Fraser Institute, Vancouver. Internet, retrieved from www.freetheworld.com.

Hall, R. and C. Jones (1999), 'Why Do Some Countries Produce so Much More Output per Worker than Others?', *Quarterly Journal of Economics*, Vol. 114, pp. 83–116.

Hausmann, R. and F. Fernández-Arias (2001), 'Foreign Direct Investment: Good Cholesterol?' in J. Braga, J. de Macedo and E. Iglesias (eds.), *Foreign Direct Investments versus Other Flows to Latin America*, OECD, Paris.

Heritage Foundation (2004), *Index of Economic Freedom*, The Heritage Foundation, Washington DC and Dow Jones and Company, New York.

Herzer, D., S. Klasen and D. Nowak-Lahman (2008), 'In Search of FDI-led Growth in Developing Countries', *Economic Modelling*, Vol. 25, pp. 793–810.

Javorcik, B. (2004), 'The Composition of Foreign Direct Investment and Protection of Intellectual Property Rights: Evidence from Transition Economies', *European Economic Review*, Vol. 48, pp. 39–62.

Krugman, P. (2000), 'Fire-sale FDI', in S. Edwards (ed.), *Capital Flows and the Emerging Economies*, The University of Chicago Press, Chicago.

Mankiw, N. G., D. Romer and D. Weil (1992), 'A Contribution to the Empirics of Economic Growth', *Quarterly Journal of Economics*, Vol. 107, pp. 407–37.

Mlambo, K. (2005), 'Reviving Foreign Direct Investments in Southern Africa: Constraints and Policies', *African Development Review*, Vol. 17, No. 3, pp. 552–79.

Moran, T. H. (1998), *Foreign Direct Investment and Development: The New Policy Agenda for Developing Countries and Economies in Transition*, Institute of International Economics, Washington DC.

Nawaz, S. (2015), 'Growth Effects of Institutions: A Disaggregated Analysis', *Economic Modelling*, Vol. 45, pp. 118–26.

North, D. C. (1991), 'Institutions', *The Journal of Economic Perspectives*, Vol. 5, No. 1, pp. 97–112.

Quazi, R. (2007), 'Economic Freedom and Foreign Direct Investment in East Asia', *Journal of the Asia Pacific Economy*, Vol. 12, No. 3, pp. 329–44.

Razin, A., E. Sadka and C. Yuen (1999), 'An Information-based Model of FDI: The Gains from Trade Revisited', *International Tax and Public Finance*, Vol. 6, pp. 579–96.

Rodriguez-Clare, A. (1996), 'Multinationals, Linkages, and Economic Development', *American Economic Review*, Vol. 86, pp. 852–73.

Rodrik, D., A. Subramanian and F. Trebbi (2004), 'Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development', *Journal of Economic Growth*, Vol. 9, No. 2, pp. 131–65.

Stiglitz, J. E. (2000), 'Capital Market Liberalization, Economic Growth, and Instability', *World Development*, Vol. 28, No. 6, pp. 1075–86.

UNCTAD (2001), *World Investment Report: Promoting Linkages*, United Nations, New York.

UNCTAD (2014), *World Investment Report: Investing in the SDGs: An Action Plan*, United Nations, New York.

World Bank (1999), *Global Economic Prospects and Developing Countries 1999/2000*, World Bank, Washington DC.

World Bank (2015), *World Development Indicators*, World Bank, Washington DC.

Xu, B. (2000), 'Multinational Enterprises, Technology Diffusion, and Host Country Productivity Growth', *Journal of Development Economics*, Vol. 62, pp. 477–93.