Exploring the Dynamic Links between FDI and Economic Growth in MENA Countries

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ABSTRACT

This article aims to explore the causal relationship between economic growth and foreign direct investment (FDI). It draws upon various theoretical and empirical studies that investigate the impact of FDI on economic growth. Additionally, we assess the dynamic relationship between FDI and economic growth in a sample of 22 countries in the MENA region. The estimation of this dynamic relationship for the years 1985-2020 across these countries is conducted using the Generalized Method of Moments (GMM). Furthermore, the Dumitrescu and Hurlin (2012) test is employed to scrutinize the presence or absence of a causal direction in panel data between FDI and economic growth, approximated by gross domestic product (GDP). Our findings suggest the existence of a unidirectional relationship from FDI to economic growth.

Keywords: FDI, Economic growth, causality, Generalized Method of Moments, MENA region.

INTRODUCTION

In an era characterized by increased globalization, FDI represents a commercial phenomenon of crucial importance. It is generally accepted that FDI tends to improve the economic performance of the host countries, particularly by promoting their economic growth. In this context, FDI is of great importance when it comes to the least developed countries, and especially for transition countries. In fact, FDI can provide for both of them direct capital financing and create positive externalities through technology and know-how transfer from countries with advanced technology to countries in transition (Angelo poulou and Liargovas, 2019).

These externalities can occur across the linkages established between entering MNCs companies and local suppliers, even through increased competition, imitation and training. Through these channels, FDI can be a source of the increased productivity in transition countries, strengthen trade openness with other countries, and in the long term, it may facilitate their economic integration with developed countries. In fact, our world economy today is characterized by an increase in foreign direct investment, but also the degree of economic integration has increased, and some countries have chosen to join regional trade union[1]. Generally, union-affiliated states have similar characteristics, such as their level of development or market size. Furthermore, these countries are the most common as far as possible to coordinate their trade policies or some of their economic and fiscal policies, as this can contribute to their economic stability, create opportunities for internal efficiency, and attract more FDI within the country's union.

Empirical research on the subject have shows that economic integration could contribute to increasing FDI, by constituting an important stimulus for the latter in a given region (see Brenton (1996)[2] for an example). Through theoretical analysis in the literature dealing with the effects of FDI and economic growth, these effects can be understood in terms of two seemingly contradictory contexts: Neoclassical economic growth model and endogenous growth model (Iamsiraroj, 2016). In fact, from a neoclassical point of view, their

theories suggest that Long-term growth could result either from technical progress and/or labor, which is the case with the latter considered as exogenous.

By accepting the work of De Mello (1997) and Solow (1957), they tried to model the impact of FDI as it might be stimulate the economic growth is achieved through a positive and lasting impact on technical progress. Considering the hypothesis of a decreasing returns to capital inputs, a neoclassical theory stipulates a convergence of economies towards the same steady growth rate. Therefore, FDI only affects Short-term growth and long-term growth remain the same. This lack of realism on the part of the page neoclassicism paved the way for other models, especially those endogenous growth, which some consider more appropriate, because they emphasize roles of technological change. To this end, an endogenous growth model was developed by Lucas (1988), Rebelo (1991) and Romer (1986). The model introduces capital in the form of human capital accumulation and R&D and suggest that these two types of capital are the source of externalities.

FDI could contribute not only to encourage the incorporation of new inputs and technologies into the production systems of host countries, but also to stimulate endogenous economic growth if it generates productivity, positive externalities and spillover effects. Given that FDI therefore constitutes a crucial source of know-how, human capital and technology diffusion, this suggests that these factors could be initiated to promote economic growth through FDI flows. Compared to neoclassical growth models, endogenous growth models and direct channels could more clearly and precisely explain the effects of FDI on growth. As such, it is therefore more appropriate to use the endogenous growth model for the explanation of the growth-IDE association. In this sense, the effect of FDI on economic growth has been the subject of several theoretical and empirical works in recent decades. Moreover, various studies have emerged on the theories of FDI, their advantages and disadvantages as well as the effect of certain macroeconomic variables on FDI (Yusop,1992; Jackson and Markowski, 1995; Cheng & Yum, 2000 and Lim and Maisonm, 2000).

Most of these works agree that there is a positive causal relationship, either in the short term, or in the long term or both between FDI and economic growth. Zhang (2001) indeed found the same result for the countries of East Asia and Latin America and he concluded through his study that the transfer of technology and the efficiency of spillovers constitutes a key advantage created by FDI for beneficiary countries. Although, this advantage is not automatic, but rather stems from the absorptive capacities of the beneficiary countries, for example the development of human capital or an export-oriented FDI policy. Thus, the work carried out on the study of the causal relationship between economic growth and FDI plays a major role in economic development. In fact, when there is unidirectional causality from economic growth to FDI, this suggests that the growth of national income plays the role of catalyst to attract FDI. However, if the causality goes in the other direction, this indicates that FDI is not only a stimulator of economic growth but it is also likely to increase employment and lead to the formation of fixed capital. When there is a two-way causality between FDI and growth, then the relationship is strengthened. In this context, Chee-Keong Choong et al. (2004) tried to analyze this causal relationship between these two variables through different hypotheses. According to them, the hypothesis that growth is generated by FDI is mainly based on the endogenous growth model. Indeed, this model stipulates that foreign direct investment is associated with other factors, such as human capital or technology transfer for example. However, whether or not these factors have significant effects on economic growth remains to be seen (Borensztein, De Gregorio and Lee (1998) and Lim and Maisonom (2000)).

Considering that these factors could stimulate and encourage economic growth through FDI, Zhang (2001) suggests that FDI could have positive effect on growth, by reducing the balance of payments deficit. Taking the case that economic growth generates FDI, this hypothesis is based on MNC (Multinational Enterprises theory). Dunning (1995) argues through his eclectic paradigm that multinationals with certain ownership advantages will invest in another country with geographical advantages. These advantages can then be effectively captured by the "internalization" of production by FDI. It therefore emerges that this hypothesis

focuses on factors of location, for example the size of the market, which is a very important factor for the attractiveness of FDI. Actually, the larger the market size of a host country with a high growth rate, the more FDI will increase due to a high expected rate of return. These high rates of economic growth will lead to increased levels of aggregate demand for both domestic and foreign investors (Zhang, 2001) and better economic performance therefore means better infrastructure and opportunities to generate income profits.

Our paper is organized in two parts. In the first part, we refer to a review of the literature that studies the causal direction between economic growth and FDI. In the second part, we empirically verify this causal direction for the MENA region using the heteroskedastic causality test on panel data by Dumitrescu and Hurlin (2012) and estimate an economic growth model by the GMM technique through the two-step method of Arrelano and Bond (1991).

LITERATURE REVIEW

There are several arguments in the theoretical and empirical literature that suggest that economic recovery in a country is often associated with large foreign direct investment (FDI) inflows (Tafirenyika, 2017). Several works that focus on FDI have confirmed the existence of a causal link between growth and FDI. Using a panel of 117 countries for a 22-year period from 1995 to 2016, Roberto and Chiara (2021) test the causal relationship between inward FDI and economic complexity using a Panel VAR approach and impulse response functions. They find that the accumulation of a higher stock of inward FDI leads to greater economic complexity in a country, not vice versa. This causal effect is very small and only occurs in countries with above-average levels of GDP per capita, higher education, tertiarization or financial development. Argiro Moudatsou and Dimitrios Kyrkilis (2011) studied the causal relationship between economic growth and FDI on panel data from two different associations : the European Union and ASEAN for the period 1970 to 2003. Their results indicate that for the EU countries, the hypothesis that growth generates FDI is confirmed, and for the Association of Southest Asian Nations (ASEAN) countries, there is a two-way causality between GDP per capita and FDI for Thailand and Indonesia. Regarding the case of Singapore and the Philippines, their results confirm that FDI is driven by GDP growth. Using the traditional causality testing method developed by Holtz-Eakin and al (1988), Choe (2003) suggests that there is bidirectional causality between FDI and growth for a panel of 80 countries during the period (1971-1995), but the effect of FDI on growth is small.

Hansen and Rand (2004) analyze the Granger causality relationship between foreign direct investment (FDI) and GDP for a sample of 31 developing countries covering the period 1970-2000. Using estimators for heterogeneous panel data, their results suggest a bidirectional causality between the FDI/GDP ratio and the level of GDP, and this is in favor of the hypothesis that FDI has an impact on GDP through knowledge transfers and the adoption of new technologies. The same result was found by Afolabi and Bakar (2016) and Keho (2015) for the South African economies and Nigeria. Frimpong et al. (2006) studied the causality between FDI and economic growth in Ghana, but they find no evidence to suggest a causal link between FDI and economic growth. Similarly, Angelopoulou and Liargovas (2014) empirically studied the relationship between economic growth and FDI by analyzing Panel data from three groups of countries for the period from 1989 to 2008 and they do not find a robust causal relationship between economic growth and FDI. Studies on the causal relationship between FDI inflows and economic growth have a major role as they contribute to economic development. When there is a unidirectional causality of economic growth on FDI, this suggests that national income growth can be used as a catalyst to attract FDI flows.

Besides, if unidirectional causality shifts from FDI to economic growth, this strongly suggests that FDI stimulates economic growth, thereby increasing gross fixed capital formation and employment (Borensztein, De Gregorio and Lee (1998), Lim and Maisom (2000) and Zhang (2001)). Finally, if bidirectional causality exists between these variables, FDI and economic growth would have an enhanced causal relationship and policymakers could thus target both simultaneously for economic growth. In the same line, Abdouli M and

Hammami S (2017) investigate the causal relationship between environmental quality, foreign direct investment, and economic growth using a simultaneous equation VAR model on a Panel of 17 MENA countries over the period 1990-2012. Their empirical results point to the existence of a unidirectional causality from both FDI stocks and CO_2 emissions to economic growth. Within this framework, Almfrajia and Almsafirc (2014) tried to identify several empirical works that examine this relationship, while indicating the type of relationship that exists. The different researches are represented in table 1.

Table 1 : Researches on the general FDI- economic growth relation

FDI effects on EG	Sources	Data	Empirical approach	Results
Significant (Positive)	Manuchehr and Ericsson (2001a)	Danemark, Finland, Sweden and Norway (1970-1997)	Lag-augmented vector autoregression	FDI to growth causality for Norway.
	Nair-Reichert and Weinhold (2001)	24 developing countries (1971-1995)	Mixed fixed and random coefficient approach	FDI on average has a significant impact on growth but the relationship is heterogeneous across countries.
	Choe (2003)	80 developed and developing countries (1971-1995)	Granger causality test of Holtz-Eakin	FDI granger causes economic growth
	Chowdhury and Mavrotas (2006)	Chile, Malaysia and Thailand (1969-2000)	Lag-augmented vector autoregression	Bidirectional causality in Malaysia and Thailand.
	Shaikh (2010)	47 developing countries (1981-1999)	OLS regression	Positive in manufacturing sector
	Griffiths and Sapsford (2004)	Mexico (1970-1999)	OLS regression	Two-period lag of FDI was found significant in the period 1980-1999.
	Chakraborty and Nunnenkamp (2006)	India (1987-2000)	Granger causality test of cointegration	Bidirectional causality in manufacturing sector
	Al-Iriani (2007)	Bahrain, Kuwait, Oman, Saudi Arabia and United Arab Emirates (1970-2004)	Granger causality test of Holtz-Eakin	Bidirectional causality between FDI and economic growth.
	Shaikh (2010)	Malaysia (1970-2005)	OLS regression	There is a significant relationship between economic growth and FDI inflows in Malysia.
	Faras and Ghali (2009)	GCC countries (1970-2006)	Test results for unit roots	FDI inflows contribute to economic growth.
	Umoh, Jacob and Chuku (2012)	Nigeria (1970-2008)	Single and simultaneous equation systems	There is postive feedback from FDI to growth and from growth to FDI in Nigeria.

Weak	De Mello (1999)	32 developed and developing countries (1970-1990)	Stationarity test	Weak evidence for FDI effects on economic growth.
Null	Manuchehr and Ericsson (2001)	Denmark, Finland, Sweden and Norway (1970-1997)	Lag-augmented vector autoregression.	No causal relationship for Finland and Danemark.
	Chowdhury and Mavrotas (2006)	Chile, Malaysia and Thailand (1969- 2000)	Lag-augmented vector autoregression.	No relationship in Chile.
	Chakraborty et Nunnenkamp (2006)	India (1987-2000)	Granger causality tests cointegration	No causal relationship in primary sector.
	Sarkar (2007)	51 pays les moins développés (1970-2002)	-OLS fixed and random effects regression. -Autoregressive distributive Lag approach.	In the majority of cases there is no log term relation between FDI and economic growth.
Negative	Shaikh (2010)	47 developing countries (1981- 1999)	OLS regression	Negative effect in primary sector.
	Khaliq and Noy (2007)	Indonesia (1998- 2006)	OLS fixed effects. Regression	Negative effect on growth in the minnig and quarrying sector.

source 1: Almfraji M.A et Almsafir M.K (2014)

EMPIRICAL VALIDATION

We attempt to empirically verify the causal direction between FDI and economic growth from a database extracted from the World Bank, the Monetary Fund, the Organisation for Economic Co-operation and Development (OECD), the World Governance Indicators (WGI), and the National Institute of Statistics of each MENA country during the study period from 1985 to 2020 on annual frequencies. We refer to the specification below to express the logarithm of gross domestic product (PIB) as a function of the lag of GDP and the other explanatory variables.

The variables of our model are defined as follows: economic growth approximated by gross domestic product (LGDP), foreign direct investment (LFDI) inflows, human capital (LHC), trade openness (Ltrade), private domestic investment (LPDI), inflation rate measured by the consumer price index (LCPI), financial development (LFD), : The time effect, : The individual heterogeneity term and : The error term.

Our sample contains the following countries: Algeria, Bahrain, Djibouti, Egypt, Ethiopia, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen. We will use statistical indicators for the different variables above. The following table is the descriptive analysis.

Table 2**:** Descriptive statistics

	Mean	Std–Dev	Skewness	Kurtosis	Jarques-Bera	Significativity
LGDP	8.1927	1.4446	-0.0380	-0.3498	4.2289	0.0000
LFDI	2.2893	3.7292	2.8109	14.6628	8137.8497	0.0000

LHC	2.8006	1.0484	-1.5966	3.9154	842.3907	0.0000
Ltrade	4.2908	0.7468	-4.7809	43.3865	64971.5312	0.0000
LPDI	3.1407	0.3828	-0.8444	2.3999	283.1197	0.0000
LCPI	4.2307	-1.1709	-3.0134	15.0407	8664.0199	0.0000
LFD	3.3089	0.9310	-0.7685	0.1663	78.8720	0.0000

source 2 : Authors

The descriptive statistics describe the level of risk and the evolution of the different variables over time. The "Kurtosis" coefficient measures the degree of kurtosis of the distribution. If this coefficient is equal to 3, the distribution follows a normal distribution, the opposite proves that the variables are not flattened. Skewness statistics measure the degree of asymmetry. The skewness is considered to be shifted to the left if the coefficient is positive; otherwise, the skewness is shifted to the right when the coefficient is negative. If the statistic is very close to 0, the information is said to be symmetric. In addition, the Jarque-Bera test is performed to test the normality of the distribution. A high coefficient greater than the tabulated Chi-square value indicates that the null hypothesis of normality of the data is rejected.

The investment rate averages 2.29% with a standard deviation of 3.73. The average growth rate has a coefficient of 8.19%, with a standard deviation of 1.44. Overall, all variables show a good linear fit as their standard deviations are low, indeed, the openness variable (Ltrade) has a coefficient of 0.75 and the domestic investment variable (LPDI) has a standard deviation of 0.38. The skewness statistics also indicate the existence of asymmetric information.

Except for the FDI variable (LFDI) whose skewness is right-shifted, all other variables exhibit left-shifted skewness of information. The Kurtosis coefficients also indicate that the openness variable has a higher coefficient (44.89), this indicates the non-matching of this variable. This is also the case for the FDI and human capital variables. For all other variables, it is a leptokurtic distribution as their coefficients are lower than 3. All the variables do not follow a normal distribution (p-value of the Jarque-bera statistic is less than 0.10), except for the lagged GDP variable which has a coefficient equal to 0.12. In fact, we reject the null hypothesis of the normality of the variables at a significance level of 1% for all the variables, except for the LGDP variable which follows a normal distribution because the Jarque-Bera statistic is statistically significant at the 1% level.

We test the causal direction between FDI and economic growth using the Granger non-causality test on heterogeneous panel data proposed by Dumitrescu and Hurlin (2012) which is shown in Table 3 below:

Table 3**:** Dumitrescu and Hurlin's (2012) test

	Chi2 (66)	Significance
LFDI	80.180	0.113
LGDP	104.339	0.001

source 3 : Authors

The results show that the null hypothesis of no causality in either direction cannot be rejected. Therefore, there is a uni-causal (or unidirectional) relationship between FDI and economic growth. This causal relationship runs from FDI to the economic growth variable. These results show that past values of FDI are used to predict the present and future level of economic growth. Nevertheless, the present and past values of economic growth are not a predictor of FDI levels. In order to support this result obtained by performing Dumitrescu and Hurlin's (2012) test that there is a unidirectional relationship between economic growth and

FDI. For this reason, it is crucial to perform an empirical estimation using the Generalized Method of Moments (GMM) technique to model the relationship between economic growth, macroeconomic variables, and FDI flows. We specifically refer to the two-step procedure proposed by Arellano and Bond (1991). Results of estimation are summarized in the following table 4:

Tableau 4 : GMM method's estimation				
	First step		**Second step**	
	Coefficient	**Significativity**	**Coefficient**	**Significativity**
Constant	-125.9655	0.7850	5.3233	0.7398
LGDPt-1	-0.3235	0.7006	0.5931	0.0002***
LFDI	-5.0318	0.6696	0.2043	0.0345**
LHC	24.3612	0.5873	0.4988	0.6585
Ltrade	10.7172	0.7785	-3.1918	0.1719
LPDI	44.8854	0.6279	3.1298	0.1408
LCPI	-27.6373	0.6459	0.2544	0.8740
LFD	0.0000	0.0000	-1.3385	0.0199***
Sargan's Test	$3.2243\ 10^{-23}$	1.0000	22.1814	1.0000
Hansen's Test	767.599	0.0000	70.858	0.0000

source 4 : Authors

Sargan's test (1958) provides insights into the model specification when the lagged variable of GDP per capita is employed as an instrument (p-value higher than 10%). From this test, we can perceive that the instruments are under-specified since the Sargan's statistic is insignificant. In the same line, a second-order auto correlation problem was detected by the significance of the Hansen's test. The lagged endogenous variable ($LGDP_{t-1}$) shows a positive and statistically significant impact at the 1% level. The economic growth rate appears to be a dynamic process. The rate of openness (Ltrade) is generally involved in explaining GDP with positive and statistically significant coefficients. Some economists suggest that exports lead to an increase in productivity. In our case, this variable shows a negative and insignificant effect. As for domestic investment (LPDI), it's an important determinant of economic growth in all the selected countries and shows a positive but statistically insignificant sign. Private domestic investment is not an important factor in explaining economic growth. One possible explanation for these potential effects could be the lack of dynamic efficiency in private domestic investment within these countries. The result is consistent with Lin and al (1996) using data from Taiwan and Korea. Human capital (LHC) appears to have a statistically insignificant positive effect on the dependent variable. This suggests that investment in education and training for the MENA region contributes positively to economic growth. Aurora and al. (2016) similarly discover a positive and significant impact, suggesting that a nation with an abundant stock of human capital characterized by a high level of education will experience faster growth compared to other countries. Certainly, this outcome aligns with intuition, suggesting that a country possessing a skilled human capital base is more likely to enhance its economic growth. For developing countries, especially those in the MENA region, the influence is not noteworthy. These nations must depend on their human capital and increasingly invest in education to enhance their economic growth. The variable measured by the degree of financial development (LFD) shows a significant negative effect on the growth rate of the countries in our sample. it appears that these nations exert significant control over their financial systems, which makes the contribution of the financial sector to capital accumulation non-optimal. The financing of non-productive projects is guaranteed by the banking sector, which dominates most financial systems in developing

countries. Finally, considering the influence of Foreign Direct Investment (FDI) inflows (LFDI) on economic well-being., the effect remains positive and statistically significant at the 1% level. FDI is seen as a channel for transferring technology and knowledge, thus improving productivity and subsequently economic growth. This outcome aligns with intuition and is consistent with the theoretical and empirical literature on the subject, where FDI is considered as one of the main determinants of economic growth.

CONCLUSION

The link between economic growth and Foreign Direct Investment (FDI) has been widely debated by researchers in the economic sphere, but the conclusions remain rather mixed. Therefore, it cannot be asserted with certainty whether there is a bidirectional relationship. By examining the effects of FDI flows and certain determinants on economic growth and empirically studying the causal relationship between these two variables, the main result that emerges from conducting the Dumitrescu and Hurlin (2012) test is that there is a unidirectional causal relationship between growth and FDI for countries in the MENA region. Employing the Generalized Method of Moments (GMM) for estimating our dynamic panel encompassing 22 countries over the period from 1985 to 2020, the positive impact of Foreign Direct Investment (FDI) inflows on the economic growth of these MENA countries is strengthened.

Foreign direct investment is, therefore, an important determinant for stimulating economic growth. The relationship is not reciprocal, and growth has no effect on FDI inflows in the MENA region. Openness in the MENA region does not promote economic growth, and these countries should take measures to facilitate trade by eliminating entry barriers to stimulate economic growth. The negative effect of financial development on growth is justified due to increased interventions in the financial system of some countries in the region, which no longer makes the financial sector's contribution to capital accumulation as optimal.

This paper has allowed us to highlight the unidirectional relationship between growth and FDI and the various determinants that could stimulate them. Grounded on the findings of this paper, countries in the MENA region should initiate reforms to attract more FDI to ensure their economic prosperity. While this work represents an additional contribution to the existing literature, this study does not account for the heterogeneity among the various countries under examination and could be enhanced by decomposing our sample into subsets of countries, considering factors such as their level of integration or development. Further refinement could be achieved by introducing interaction variables to better capture the effect of Foreign Direct Investments (FDI) on growth, and employing, for instance, a simultaneous equations model to investigate the simultaneous impact of FDI and economic growth.

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FOOT NOTES

[1] The European Union (EU) is a good example of increased regional economic integration. The number of its member countries has steadily increased over the years. There were only 6 member countries in 1951 and 28 member countries in 2013.

[2] Brenton (1996) found that the single market program of the European Union (EU) led to a significant increase in investment by EU firms in other countries of the same union in the late 1980s.