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The Relationship Between Trade Openness, Foreign Direct Investment Inflows, and Economic Growth in Middle East and North of Africa Region: Autoregressive Distributed Lag Model vs. Vector Error Correction Model

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Abstract

This study examines the dynamics of cause and effect relationship between trade openness, foreign direct investment (FDI), and economic growth on a set of 15 MENA countries (newly emerging countries), namely Tunisia, Algeria, Morocco, Egypt, Iran, Syria, Turkey, Israel, Bahrain, Qatar, Saudi Arabia, Kuwait, the UAE, Jordan, and Oman, for a time span 1990–2012, by applying the ARDL bounds testing approach newly developed cointegration. The procedure Granger is used to test the direction of causality in the vector error correction model (VECM). The set of variables is cointegrated; they must have an error correction representation in which an error correction term (ECT) is incorporated in the model (Engle & Granger, 1987). Cointegration and error correction: Representation, estimation, and testing. Econometrica, 251–76.). The results show that there is a cointegration relationship between the variables specified in the model when production and FDI are dependent variables. Trade openness and FDI promoted economic growth in MENA countries in the long term. In this respect, several questions can be asked: Would an anti-world without opening be better for these countries? Finally, we make some recommendations for MENA's international trade, foreign investment, and economic growth.

Research Highlights

- We examine the dynamics of cause and effect relationshipbetween trade, FDI, and economic growth.
- We use the ARDL approach, the VECM,for a sample of 15 MENA countries.
- We show that there is a co-integrationrelationship between the variables.
- In the short term,there is a unidirectional causality from trade openness to FDI and FDI to GDP. So, there is no causality between GDP and FDI.

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Extended author information available on the last page of the article

Keywords Trade openness · FDI · Economic growth · ARDL bounds testing · VECM

Introduction

Foreign direct investment (FDI) inflows and trade openness were qualified as the most important predicates of globalization of the most striking attributes and the major challenges for both developed and developing countries; they occupy a prominent place in most world countries due to the convergence of two concerns: companies seeking to internationalize and governments seeking to attract more and more foreign capital.

The role of trade on economic growth in each country has been the focus of considerable academic effort. Trade openness, to gross domestic product (GDP) per capita, has been considered one of the main determinants of economic growth.

The impact of trade openness on economic growth can be positive and significant mainly due to the accumulation of physical capital and technological transfer.

To investigate the real impact of trade, various studies have analyzed the positive relationship between trade openness and economic growth since international trade opens the door for international investors to invest in the host countries and facilitates the transfer of knowledge between rich and poor countries. Therefore, trade improves the economic activity and can be a driver of economic growth. Most researchers agreeing with this opinion have found similar conclusion. For example, earlier studies by Little et al. (1970), Krueger (1978), Bhagwati (1988), Michaely (1977), and Choksi et al. (1991) found that trade openness leads to more rapid growth of exports and GDP per capita without significant transitional costs of unemployment. Other studies found different results at first a negative relationship between trade openness and growth. For example, Yanikkaya (2003), Eris and Ulasan (2013), and Dollar (1992) indicated that trade openness was not directly correlated with economic growth in the long run. They also found that economic growth was explained by economic institutions and macroeconomic uncertainties such as those induced by high inflation and excess government consumption.

Inward FDI can play an important role in the increase of employment, productivity, exports, and in the transfer of technology, and the recent empirical evidences like De Mello (1997) and Slywester (2005) are a good example. In some countries, foreign firms are required to use host countries' resources and export a part of their output and such policies of the host government can act as disincentive to FDI, likewise, various bureaucratic delays in processing of applications from foreign firms and in authorizing and granting licenses to investment projects would not encourage investment from foreign companies.

The aim of this research is to investigate the economic impacts of trade openness and FDI inflows on the growth in the MENA region. The choice of this

country among others is justified by several reasons. First, it is a region of great economic diversity that includes both oil-rich Gulf economies and resource-poor countries in relation to their population. For the past quarter century, two factors have profoundly influenced the economic prosperity of the region: the price of oil and the legacy of economic policies and structures in which the State has had a dominant role. This region has experienced fluctuations in long-term oil growth (Ramey & Ramey, 1995); we can expose them as follows: The actual average growth of oil exporters should gain less than one percentage point from 2009 to stand at 2.9% in 2010, 4.2% in 2011, and 3.9% in 2012. The rate real growth of oil importers is expected to reach 4.9% in 2010, 5.3% in 2011, and 5.7% in 2012 on average.

Specifically, in this study, we conduct various models: the dynamic causal relationship between trade openness, FDI, and economic growth in MENA region by implementing the newly developed ARDL bounds testing approach to cointegration. We also include the Granger of causality within the vector error correction model (VECM). If a set of variables is cointegrated, they must have an error correction representation wherein an error correction term (ECT) is incorporated in the model (Engle & Granger, 1987). The advantage of VECM is the reintroduction of the information lost by differencing time series. However, what are the spillover effects of trade openness, FDI inflows on the domestic growth? This step is fundamental to investigate the short-run dynamics and the long-run equilibrium. The most important result found in the empirical section is a cointegration relationship between the variables specified in the model when production and FDI are dependent variables. Unfortunately, the major obstacle here is the availability of data, which are still lacking.

The remainder of this work is organized as follows: Section 1 presents the introduction. Section 2 reports a literature review on trade openness, FDI and economic growth and gives a look at the nature of trade in MENA. Section 3 describes the data and methodology. Section 4 concludes the remarks and policy implications.

Review of Theoretical and Empirical Literature

The neoclassical growth models, from the Solow model (1957), assume that technological change is exogenous. In such a framework, trade policies of a country cannot therefore be considered as an element affecting its growth. During the 1970s, most empirical studies were using cross-sectional regressions on a set of countries. The correlation coefficients were made either between export growth and GDP or between indices representing the opening or trade and long-term growth policies.

Most of these studies have found a positive relationship between openness and growth. Since the 1980s, economists have used the concept of strategic trade policy, which takes account of imperfect competition and increasing returns on the international market, they can criticize ideas on free trade. According to the new view,

a government can take strategic measures to increase income in another country at the cost-subsidizing exports or erect trade barriers, protect certain businesses from foreign competition, and promote the development of new industries and creation as a main engine of growth (Arrow (1962); Romer (1986, 1990); Lucas (1988); Grossman and Helpman (1991)).

This volume focuses on the experience of specific industries to determine the effectiveness of the strategic trade policy measures in promoting economic growth. Since the early 1990s, new growth theories have considered technological change as endogenous. It then becomes possible to combine the new theory of international trade with endogenous growth. Both theoretical and empirical researches have provided mixed and conflicting evidences on the effect of trade on FDI and on economic growth. However, as Greenaway (1998) opined, empirical studies have found more cases of positive than negative impacts.

Under the new endogenous growth theory, total factor productivity (TFP) is endogenously determined by economic factors. Technological progress (TP) and FDI were considered indications of a permanent effect on growth in the host country through the effects of technology transfer and spin-offs. According to the literature on the relationship between FDI and economic growth (see De Mello Jr, 1997; Borensztein et al., 1998), FDI can stimulate knowledge transfer, both in terms of training of the labor of work and skills and the introduction of alternative management practices and better organizational modalities. The opening of trade promotes economic growth; exports can increase productivity and reduce foreign exchange constraints of the country; imports can provide the country with advanced technology. Trade openness is also necessary to acquire the potential impact of growth of FDI (Balasubramanyam et al., 1996). In addition, economic growth has effects on trade and FDI.

The long-run causality between trade openness and economic growth in Mexico was investigated by Oladipo (2011). The sample covers the period 1980 to 2008 and the econometric method used is based on the error correction model (ECM).

The empirical finding indicates that in the long run, economic growth is dependent on trade openness and investment. However, the labor force and human capital do not exert a significant effect. The policy implication of these results is that Mexico is encouraged to intensify trade and to give more incentives for investment in order to promote sustainable long-run economic growth. A similar result was found in the study by Shahbaz et al. (2012). Who used the ARDL bounds testing approach and the increasing production function to test the long-run effect of trade openness on economic growth in Pakistan?

As some recent studies have found a strong relationship between trade and growth, some others have found a weak and even a negative relationship between trade openness and growth. For example, Yanikkaya (2003) investigated the link between trade openness and economic growth in a panel of 100 developed and developing countries observed during the period 1970 to 1997. Using an OLS regression, then a seemingly unrelated regression (SUR), he found that all methods have provided similar results implying a weaker relationship between trade openness and economic growth. Similarly, Eris and Ulasan (2013) conducted Bayesian model averaging (BMA) techniques to check for the type of relationship between trade openness and long-run economic growth. Their results indicate that trade openness

Table 1 The FDI and economic growth empirical literature

Study	Sample and period	Major findings
Aitken et al. (1997)	Mexico over the period 1986–1990	The probability that a local company's exports increase with proximity to multinationals location
Menegaldo and Moustier (2002)	Europe and the countries south of the Mediterranean between 1985 and 1997	The existence of a long-term relationship between foreign direct investment and exports-imports, stimulating growth for each country
Rugruff and Minguy (2003)	Hungary and Vietnam	Openness to FDI disorganized integration and specialization of Hungary while the influence of Vietnam was rather modest
Aurangzeb and Stengos (2014)	The BRICS economies in the period 2004–2008	The data shows that emerging economies started to grow in 2010, unlike most developed economies, which continued to decline. In the BRICS economies, FDI seems to have a positive impact by contributing to the economic development of these countries to reach developed economies. Further research will examine the impact of FDI on the economies of the BRICS using an econometric model
Belloumi (2014)	Tunisia for the period from 1970 to 2008	The results found for Tunisia can be generalized and compared to other developing countries which share a common experience in attracting FDI and trade liberalization
Fadhi and Almsafir (2015)	Malaysia from 1975 to 2010	The results show that the FDI inflows together with the human capital development contribute strongly to the host country's economic growth. But the technology spillovers of FDI inflows are still not sufficiently combined with human capital to contribute to economic growth. Thus, government should make more efforts to develop national human capital to attract and serve for FDI inflows. Moreover, the openness of the economy and the foreign exchange environment should continue moving in favorable track
Hakimi and Helmi (2016)	Tunisia and Morocco: time series covers the period from 1971 to 2013	The nature of FDI inflows in Morocco and Tunisia are not clean FDI. The results show that trade liberalization has a negative impact on the environment. The paper concludes that although trade liberalization has boosted the economies of both countries by creating new employment opportunities, liberalization has harmed the environment
Turnbull et al. (2016)	Australia: from 1988 to 2012	Trade liberalization as a mechanism for improving productivity within the domestic manufacturing sector. Foreign direct investment has not had a statistically significant impact on productivity within the sector

Table 1 (continued)

Study	Sample and period	Major findings
Sakyi and Egyir (2017)	45 African countries over the period 1990–2014	Used the GMM model, the finding reveal supports the bhagwati hypotheses and provides vital for policy formulation aimed at promoting more credible export and FDI into-export oriented sectors in long-term strategies in African countries
Bhuimali, et al. (2019)	The top 20-FDI hosting countries sourced from UNCTAD over the period 1991–2016	The results suggest that inflows of FDI significantly promote economic growth in selected economies

Table 2 The real GDP evolution in selected MENA[a] economies (in percentage)

Average	2000–2017	2018	2019	2020	2021
Real GDP	4.5	1.2	0.8	−3.4	4
Current account balance	10.1	6.3	3.1	−2.7	−2.3

National authorities and IMF staff calculations and projections

[a]MENA: 2011–2016 data exclude Syrian Arab Republic

does not directly correlate with economic growth in the long run. They have also found that economic growth is explained by economic institutions and macroeconomic uncertainties such as those induced by high inflation and excess government consumption. Those results are similar to the findings of more recent empirical researchers such as Easterly and Levine (1997); Dollar (1992); Alcala and Ciccone (2004); and Rodrik et al. (2014). Table 1 shows the result of some studies on the relationship between FDI inflows and growth.

The MENA countries have an economic developmental delay following a study on opening policies adopted by these countries and the assumption of the abundance of natural resources which determine the specific configuration of the connection opening and opening unstable growth. By the end of 2010, the MENA countries had largely recovered from the global financial crisis and it was expected that the growth rate would reach crisis levels before 2011. In early 2011, the movements for democracy have emerged and led to a rapid change of regime in Tunisia and Egypt and spread to Bahrain, Libya, Syria, and Yemen. The agitation and uncertainty associated with these movements have impacted the short-term macroeconomic outlook and the status and speed of economic reforms in the region.

The growth in this region was sluggish throughout the Middle East and North Africa, since the decrease in oil production and the weak growth of private investment in a context of continued political transition conflicts offset the increase in public spending.

Economic activity was forming in 2017–2021 as a result of improved export growth due to the economic recovery of trade partners and increasing public and private investment. However, lack of confidence, high unemployment, low competitiveness, and, in many cases, public deficits will continue to weigh on the economic outlook of the region. In the medium term, the World Bank projects overall GDP growth to be less than 4% for the third year running about−3.4% in 2020, 4% in 2021 (see Table 2), and 3.7%[1] in 2022. This improvement compared to previous rates is partly explained by the reforms to diversify the economy and strengthen the business environment.[2]

The current account balance is declining in the MENA region. This decrease, which concerns all the countries of the region, is particularly sensitive among

[1] IMF staff estimates and projections (2011–2022 data exclude Syrian Arab Republic).

[2] World Bank, 2019.

members of the GCC (Gulf Cooperation Council). Indeed, the MENA region's current account declined from a surplus of around 15% of GDP in 2011 to a deficit of nearly 5% of GDP in 2015 and 2016—although an improvement was seen in 2017. According to World Bank forecasts, this improvement will continue over the 2018–2021 period, but will remain modest.

Downside risks prevail due to the lack of progress in the reforms during complex political transition. It will be essential to continue reforms to increase and diversify production potential and also to improve the competitiveness and adaptability in order to ensure a sustainable and inclusive growth and create jobs.

Low oil prices, conflicts, and the global economic slowdown make short-term prospects of recovery improbable. The MENA countries have launched various structural reforms to liberalize their trade sector in order to integrate the global economy and to benefit from free trade. They are committed to the multilateral process under the World Trade Organization. Four countries are full members while the three others have observer status (Table 3).

The MENA region has provided respectful efforts to attract FDI, such as facilitating doing business and offering fiscal benefits to foreign investors. The result of an increase in both indicators of trade (export, import) has led to an upward rate of trade openness. Compared to other African countries, Tunisia and Morocco have numerous advantages such as a qualified human capital, low cost of labor, decent infrastructure, and geographical proximity to Europe. These advantages have attracted important foreign direct investments in diverse sectors and have made both countries the preferred destination for European investors.

Empirical Analysis

Data Sources and Description of Variables

To highlight the relationship between economic growth, foreign direct investment, and trade openness to a panel of countries in the MENA region, we will apply the following methodological approach: first, we will specify the model to estimate, define the variables, and statistically analyze the data. Then, we will present the tests and techniques that will be used in our study. Finally, we will conclude with an estimate of variables and interpret the results.

Annual data from a set of $N=14$ countries in the MENA region (Tunisia, Algeria, Morocco, Egypt, Iran, Syria, Turkey, Bahrain, Qatar, Saudi Arabia, Kuwait, the UAE, Jordan, and Oman) concerning economic growth, FDI, trade, labor, and capital stock covering the period 1990–2012 were used in this study ($T=23$). Data are extracted from the database of the World Bank (World Development Indicators).

In this study, we use the following variables: Economic growth is measured by the growth of real GDP per capita in each successive period and for each country, denoted Y. Real GDP per capita expressed in current US $. FDI is the value of gross actual ratio of the flow of investments FDI to GDP (current US $), denoted F. Foreign direct investment are the net flows' investment to acquire a lasting interest in a

Table 3 Description of the evolution of the trade openness program in MENA

Communities	Algeria	Egypt	Libya	Mauritania	Morocco	Sudan	Tunisia
GATT	Observer status application for accession: the negotiation 03/06/1987 finals	GATT member since 1970	Observer status application for accession: 20/6/2004 and the creation of the Working Group 27/07/2004	GATT member since1995	GATT member since 1987	Observer status application for accession: 11/10/1994 and the establishment of the Working Group 25/10/1994	GATT member since 1990
WTO	-	Member since 30 June 1995	-	Member since 31 May 1995	Member since 1 January 1995	-	Member since 29 March 1995

The authors and the trade statistics of WTO membership

Table 4 Summary statistics of the variables

			GDP per capita (*Y*)		FBCF (*K*)		Labor (*L*)		FDI (*F*)		Trade (*T*)	
ID	**Pays**	**Code**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**E-T**
1	Algérie	DZA	2622.11	1311.12	2.9E+10	1.2E+10	9.3E+06	1.8E+06	0.93%	0.63%	59.72	9.74
2	Bahrein	BHR	14,579.72	5129.16	3.2E+09	1.7E+09	4.0E+05	1.8E+05	7.13%	7.32%	145.98	22.47
3	Iran	IRN	2762.87	1815.21	6.8E+10	4.5E+10	2.0E+07	4.4E+06	0.69%	0.80%	50.78	10.85
4	Jordanie	JOR	2377.44	1159.64	3.2E+09	1.1E+09	1.2E+06	2.9E+05	5.98%	6.20%	125.67	13.72
5	Koweït	KWT	26,631.21	15,162.86	1.1E+10	4.5E+09	1.0E+06	3.4E+05	0.38%	0.57%	93.51	11.56
6	Maroc	MAR	1755.00	708.85	1.5E+10	6.2E+09	1.0E+07	1.2E+06	1.60%	1.37%	64.26	9.62
7	Oman	OMN	11,451.77	6275.70	6.3E+09	3.5E+09	8.8E+05	2.5E+05	1.69%	2.02%	89.29	9.29
8	Qatar	QAT	40,257.68	26,917.52	2.5E+10	2.6E+10	5.7E+05	4.1E+05	2.72%	2.20%	88.28	7.06
9	Syrie	SYR	1495.83	720.12	4.2E+09	2.7E+09	4.9E+06	8.6E+05	1.72%	1.47%	72.05	9.96
10	Tunisie	TUN	2781.41	974.11	7.2E+09	1.9E+09	3.2E+06	4.4E+05	2.85%	1.89%	91.65	9.91
11	Turquie	TUR	5532.17	3027.76	7.9E+10	2.8E+10	2.2E+07	2.1E+06	1.15%	1.04%	45.52	8.00
12	Égypte	EGY	1499.84	740.78	1.6E+10	6.3E+09	2.1E+07	3.5E+06	2.38%	2.62%	51.89	10.30
13	Émirats AU	ARE	34,179.43	6765.29	3.7E+10	1.5E+10	2.6E+06	1.7E+06	2.00%	2.20%	141.97	24.65
14	A. Saoudite	SAU	11,937.02	5681.21	6.9E+10	3.3E+10	7.1E+06	1.8E+06	2.27%	2.54%	74.29	11.48
Global			12,001.63	5351.56	2.7E+10	1.2E+10	7.1E+06	1.3E+06	2.42%	1.52%		

firm operating in an economy other than that of the investor. Trade openness (T) is the sum of exports and imports divided by GDP. The work is noted by L which is measured by the volume of the total workforce. The capital investment (K) is measured by the real value of the gross formation of fixed capital in constant 2005 US $. The summary statistics for all variables are presented in Table 4.

Econometric Methodology and Empirical Results

FDI may increase the share capital and employment in the host country. Labor and capital are introduced into the model to control other determinants of economic growth and to reduce the bias problem of omitted variables.

The founding papers of Solow (1956, 1957) formed the basis of numerous empirical past studies using the model Neoclassic. These studies used the aggregate production function that linked the production of the economy to the inputs of capital and labor with macroeconomic series. The strength of labor and capital stock was considered variable control in the model. The investment was integrated as a fixed proportion of production. Thus, the relationship in question may be presented as follows:

$$Y_{it} = A.K_{it}^{\beta_1}.L_{it}^{\beta_3}.F_{it}^{\beta_3}.T_{it}^{\beta 4}.e^{\varepsilon_{it}} \tag{1}$$

where Y is the GDP per capita of a country i at a given date t and ε_{it} is an error term satisfying the Gauss–Markov assumptions.

The linearization of model Eq. (1) by the logarithm yields the following reduced form:

$$LnY_{it} = \beta_0 + \beta_1 LnK_{it} + \beta_2 LnL_{it} + \beta_3 LnF_{it} + \beta_4 LnT_{it} + \varepsilon_{it} \tag{2}$$

with $\beta_0 = LogA$ the constant.

Major problems of the unit root tests in panel are, firstly, the shape of the heterogeneity of the model used to test the unit root is the simplest form which is to postulate the existence of specific constants to each individual and, secondly, any correlations that might exist between individuals. The inclusion or not of these potential inter-dependencies is between two types of generations:

Those who take the absence of autocorrelation hypothesis residues (Levin et al., 2002 LLC; Im et al., 2003 IPS; Maddala & Wu, 1999; etc.), because they consider them nuisance factors, and those trying to raise this alternative because, for them, these co-movements can be used to conduct new tests (Bai & Serena, 2004; Moon & Perron, 2004; etc.). The results of the unit root tests LLC and IPS on our panel data are presented in Table 5.

The ARDL bounds test cointegration is based on the assumption that the variables are I (0) or I (1). Therefore, before applying this test, we determine the order of integration of all variables using the unit root tests. The aim is to ensure that the variables are I (2) to avoid erroneous results. In the presence of integrated second-order

Table 5 Unit root tests in level variables

Variables	Levin et al. (2002)			Im et al. (2003)	
	M1	M2	M3	M2	M3
Ln Y	2965*** (0000)	5298*** (0000)	4189*** (0000)	5645*** (0000)	4316*** (0000)
Ln K	5983 (1,000)	2288 (0989)	−0393 (0347)	4561 (1,000)	1108 (0134)
ln L	5.140 (1,000)	2952** (0002)	9114*** (0000)	2706 (0997)	5541*** (0000)
ln F	6308*** (0000)	1912** (0028)	−0019 (0492)	2370*** (0008)	1295* (0097)
ln T	0594 (0724)	4461*** (0000)	3935*** (0000)	2548*** (0005)	2720*** (0003)

M1 Model without trend and without constant, *M2* Model without trend and constant, *M3* Model with trend and constant

*, **, ***significant at 10%, 5%, and 1%. *P*-value in parentheses

variables, we cannot interpret the values of the *F* statistic provided by Pesaran et al. (2001).

The results of stationary tests show that all variables are non-stationary level with the exception of the GDP per capita that has managed to pass both tests for a significance level of 1%. In addition, tests are applied IPS LLC and unlike the first data series reject the null hypothesis of non-stationary for all variables used in this study.

It is therefore useful to enter the variable Ln Y integrated of order 0 while all other variables are integrated of order 1 and are presented in Table 6.

In order to empirically analyze the long-term relationships and short-term dynamic interactions between the variables of interest (trade openness, FDI, labor, capital, and economic growth), we apply the model to autoregressive distributed

Table 6 Unit root tests in first difference variables

Variables	Levin et al. (2002)			Im et al. (2003)	
	M1	M2	M3	M2	M3
Ln Y	18 727*** (0000)	9442*** (0000)	7525*** (0000)	12 525*** (0000)	9952*** (0000)
Ln K	10 925*** (0000)	5826*** (0000)	4105*** (0000)	8251*** (0000)	6268*** (0000)
ln L	5496*** (0000)	5328*** (0000)	4723*** (0000)	6162*** (0000)	4485*** (0000)
ln F	15 313*** (0000)	7617*** (0000)	5432*** (0000)	10 112*** (0000)	7878*** (0000)
ln T	14 773*** (0000)	9842*** (0000)	7334*** (0000)	9717*** (0000)	7110*** (0000)

M1 Model without trend and without constant, *M2* Model without trend and constant, *M3* Model with trend and constant

*, **, ***significant at 10%, 5%, and 1%. *P*-value in parentheses

lag (ARDL) cointegration as an auto-general vector (VAR) model of order p in Z_t, where Z_t is a column vector made up of five variables: $Z_t = \left(Y_t, K_t, L_t, F_t, T\right)'$.

The approach ARDL cointegration was developed by Pesaran and Shin (1999) and Pesaran et al. (2001). It has three advantages over other previous and traditional methods of cointegration. The first is that the ARDL approach does not require that all study variables should be integrated of the same order and can be applied when the underlying variables are of order one, zero, or very slightly built. The second advantage is that the ARDL test is relatively more efficient in the case of small and finite sample data sizes. The third advantage is that, by applying the ARDL technique, we get unbiased estimates of the long-term model (Harris & Sollis, 2003).

Study of the Existence of the Relationship Cointegration

The model ARDL used in this study is expressed as follows:

$$\begin{aligned}\Delta LnY_{it} =& a_{01} + b_{11}LnY_{it-1} + b_{21}LnK_{it-1} + b_{31}LnL_{it-1} + b_{41}LnF_{it-1} \\ &+ b_{51}LnT_{it-1} + \sum_{j=1}^{p} a_{1j}\Delta LnY_{it-j} + \sum_{j=0}^{q} a_{2j}\Delta LnK_{it-j} \\ &+ \sum_{j=0}^{q} a_{3j}\Delta LnL_{it-j} + \sum_{j=0}^{q} a_{4j}\Delta LnF_{it-j} + \sum_{j=0}^{q} a_{5j}\Delta LnT_{it-j} + \varepsilon_{1it}\end{aligned} \tag{3}$$

$$\begin{aligned}\Delta LnK_{it} =& a_{02} + b_{12}LnY_{it-1} + b_{22}LnK_{it-1} + b_{32}LnL_{it-1} + b_{42}LnF_{it-1} \\ &+ b_{52}LnT_{it-1} + \sum_{j=1}^{p} a_{1j}\Delta LnY_{it-j} + \sum_{j=0}^{q} a_{2j}\Delta LnK_{it-j} \\ &+ \sum_{j=0}^{q} a_{3j}\Delta LnL_{it-j} + \sum_{j=0}^{q} a_{4j}\Delta LnF_{it-j} + \sum_{j=0}^{q} a_{5j}\Delta LnT_{it-j} + \varepsilon_{2it}\end{aligned} \tag{4}$$

$$\begin{aligned}\Delta LnL_{it} =& a_{03} + b_{13}LnY_{it-1} + b_{23}LnK_{it-1} + b_{33}LnL_{it-1} + b_{43}LnF_{it-1} \\ &+ b_{53}LnT_{it-1} + \sum_{j=1}^{p} a_{1j}\Delta LnY_{it-j} + \sum_{j=0}^{q} a_{2j}\Delta LnK_{it-j} \\ &+ \sum_{j=0}^{q} a_{3j}\Delta LnL_{it-j} + \sum_{j=0}^{q} a_{4j}\Delta LnF_{it-j} + \sum_{j=0}^{q} a_{5j}\Delta LnT_{it-j} + \varepsilon_{3it}\end{aligned} \tag{5}$$

$$\begin{aligned}\Delta LnF_{it} = {} & a_{04} + b_{14}LnY_{it-1} + b_{24}LnK_{it-1} + b_{34}LnL_{it-1} \\ & + b_{44}LnF_{it-1} + b_{54}LnT_{it-1} + \sum_{j=1}^{p} a_{1j}\Delta LnY_{it-j} \\ & + \sum_{j=0}^{q} a_{2j}\Delta LnK_{it-j} + \sum_{j=0}^{q} a_{3j}\Delta LnL_{it-j} \\ & + \sum_{j=0}^{q} a_{4j}\Delta LnF_{it-j} + \sum_{j=0}^{q} a_{5j}\Delta LnT_{it-j} + \varepsilon_{4it}\end{aligned} \tag{6}$$

$$\begin{aligned}\Delta LnT_{it} = {} & a_{05} + b_{15}LnY_{it-1} + b_{25}LnK_{it-1} + b_{35}LnL_{it-1} \\ & + b_{45}LnF_{it-1} + b_{55}LnT_{it-1} + \sum_{j=1}^{p} a_{1j}\Delta LnY_{it-j} \\ & + \sum_{j=0}^{q} a_{2j}\Delta LnK_{it-j} + \sum_{j=0}^{q} a_{3j}\Delta LnL_{it-j} \\ & + \sum_{j=0}^{q} a_{4j}\Delta LnF_{it-j} + \sum_{j=0}^{q} a_{5j}\Delta LnT_{it-j} + \varepsilon_{5it}\end{aligned} \tag{7}$$

All variables are as defined above, Ln (.) is the operator of logarithm, Δ is the first difference, and T is the error terms.

The ARDL bounds test cointegration is mainly based on statistical joint F whose asymptotic distribution is non-standard under the null hypothesis of non-cointegration. The first step in the ARDL terminal approach is to estimate the above five equations by ordinary least squares (OLS). The estimate of five equations verifies the existence of a long-term relationship between the variables by performing an F test for the joint significance of the lagged levels of variable coefficients, that is:

$$H_0 : b_{1j} = b_{2j} = b_{3j} = b_{4j} = b_{5j} = 0$$

Against the alternative hypothesis of a:

$$H_1 : b_{1j} \neq b_{2j} \neq b_{3j} \neq b_{4j} \neq b_{5j} \neq 0$$

For, $j = 1, 2, 3, 4, 5$ standardized test statistic F is noted by Y for $F_Y(YK, L, F, T)$.

Two packs of critical values for a given level of significance can be determined (Pesaran et al., 2001). The first level is based on the assumption that all the variables in the ARDL model are integrated of order zero, while the second is based on the assumption that the variables are integrated of order one. The null hypothesis of no cointegration is rejected when the value of the test statistic is greater than the upper critical limit, then it is not rejected if the F statistic is less than the lower limit value. Otherwise, the cointegration test is inconclusive.

The use of this approach is guided by short-term data. We choose a maximum delay of about 1 for correction model conditional ARDL error vector using the Akaike information criterion (AIC) and Bayesian (CIS) and testing of Fischer. The

Table 7 Results from bound tests

Dependent variable	Lag	Trend	Statistics *F*	I (0)	I (1)	Decision
$F_Y(YK, L, F, T)$	1	Without	25.21***	2.86	4.01	Cointegration
$F_K(K, Y, L, F, T)$	2	Without	2.90	2.86	4.01	No cointegration
$F_L(LY, K, F, T)$	1	Without	9.94***	2.86	4.01	Cointegration
$F_F(F, Y, K, L, T)$	3	With	11.35***	3.47	4.57	Cointegration
$F_T(T, Y, K, L, F)$	2	With	9.58***	3.47	4.57	Cointegration

The critical values are obtained from the table CI (iii) case **III** (unrestricted intercept and no trend) and table CI (v) if **V** (unrestricted intercept and unrestricted trend) with $k=4$ variables in Pesaran et al. (2001, p.300 and 301). *** means that the statistical ***F*** is above the upper limit at ***99%***

calculated *F* statistics are reported in Table 7 where each variable is considered a dependent variable (standard) in the ARDL-OLS regressions. From these results, it is clear that there is a long-term relationship between the variables when GDP per capita and FDI are dependent variables because their statistics *F* are greater than the critical value of the upper limit (4.01 and 4.57) at 5%. This implies that the null hypothesis of no cointegration between the variables is rejected for four of the five equations. Our interest will, however, be devoted to the study of the variable on the economic growth and foreign direct investment.

Estimates and Interpretations of Short- and Long-Term Results

Once the cointegration relationship is established, the long-term conditional model ARDL (p, q1, q2, q3, q4) can be estimated. The optimum levels of ARDL model (p, q1, q2, q3, q4) of the five variables are selected using the AIC and Schwarz (SIC).

According to Odhiambo (2009) and Narayan and Smith (2008), short-term dynamic parameters are obtained by estimating an error correction model associated with long-term estimates. The long-term relationship between the variables indicates that there is a causal Granger in at least one direction which is determined by the *F* statistics and the correction term delayed error. The short-term causal effect is represented by the *F* statistic on variables while *T* statistic on the coefficient of the delayed error correction term represents the long-term causal relationship (Odhiambo, 2009; Narayan and Smyth, 2006). The equation, where the null hypothesis of no cointegration is rejected, is estimated with a term of error correction (Narayan and Smyth, 2006; Morley, 2006). The error correction model for each equation, the cointegration relationship, is verified and presented as follows:

$$\Delta LnY_{it} = a_{01} + \delta_1 ECT_{1it} + \sum_{j=1}^{p} a_{1j}\Delta LnY_{it-j} + \sum_{j=0}^{q_1} a_{2j}\Delta LnK_{it-j} + \sum_{j=0}^{q_2} a_{3j}\Delta LnL_{it-j} + \sum_{j=0}^{q_3} a_{4j}\Delta LnF_{it-j} + \sum_{j=0}^{q_4} a_{5j}\Delta LnT_{it-j} + \varepsilon_{1it}$$

$$\Delta LnL_{it} = a_{03} + \delta_3 ECT_{3it} + \sum_{j=1}^{p} a_{1j}\Delta LnY_{it-j} + \sum_{j=0}^{q_1} a_{2j}\Delta LnK_{it-j} + \sum_{j=0}^{q_2} a_{3j}\Delta LnL_{it-j} + \sum_{j=0}^{q_3} a_{4j}\Delta LnF_{it-j} + \sum_{j=0}^{q_4} a_{5j}\Delta LnT_{it-j} + \varepsilon_{3it}$$

$$\Delta LnT_{it} = a_{05} + \delta_5 ECT_{5it} + \sum_{j=1}^{p} a_{1j}\Delta LnY_{it-j} + \sum_{j=0}^{q_1} a_{2j}\Delta LnK_{it-j} + \sum_{j=0}^{q_2} a_{3j}\Delta LnL_{it-j} + \sum_{j=0}^{q_3} a_{4j}\Delta LnF_{it-j} + \sum_{j=0}^{q_4} a_{5j}\Delta LnT_{it-j} + \varepsilon_{5it}$$

The long-term conditional model of that can be obtained from the solution of the reduced form is written for the growth rate as follows:

$$LnY_{it} = \theta_0 + \theta_1 LnK_{it} + \theta_0 LnL_{it} + \theta_3 LnF_{it} + \theta_{04} LnT_{it} + \alpha t + \mu_{it}$$

With; $\theta_0 = -\frac{a_{01}}{b_{11}}$; $\theta_1 = -\frac{b_{21}}{b_{11}}$ $\theta_2 = -\frac{b_{31}}{b_{11}}$ $\theta_3 = -\frac{b_{31}}{b_{11}}$ and $\theta_4 = -\frac{b_{41}}{b_{11}}$. The same work will be applied if we treat FDI as the endogenous variable in Table 8.

In fact, the results indicate that the term error correction is statistically significant and negative, which proves that there is a cointegration relationship between the variables of the model. More specifically, the estimated value is−0989 implying that the speed of adjustment of long-term balance in response to the imbalance caused by the short-term impact of the previous period is nearly equal to 100%.

The second panel explains the effects of the variables on FDI flows. Indeed, the most appropriate model is represented by an ARDL (1, 3, 2, 2, 0). In the short term, we see the positive and significant effect on economic growth, and the negative and significant effect on labor. Investment in physical capital and trade openness do not represent any significant effect on FDI.

In addition, the results of the error correction model are statistically significant and negative, which proves that there is a cointegration relationship between the variables of the model.

The results used to shorten the determination of long-term estimates are shown in Table 9 for the GDP per capita and FDI.

For the equation of output, the estimated coefficients of the long-term relationship are significant for capital and FDI inflows, but not significant for business and commercial opening. Capital investments have a significant positive impact on GDP per capita at least at 5%. Similarly, FDI flows have a significant positive effect on economic growth. The work force is not significant at the 5% level. This is indicative of the problem of rising unemployment and low labor productivity in Tunisia. The high level of unemployment, which is associated with non-skilled workers and low productivity, does not encourage economic growth. Given the effects of trade opening, this variable is not significant at the 5% level. The degree of trade openness to

Table 8 The short-term estimation results

Endogenous variables	$\Delta Ln\ Y$		$\Delta Ln\ F$	
	ARDL(1,0,0,1,0)	**ECM-ARDL(1,0,0,1,0)**	**ARDL(1,3,2,2,0)**	**ECM-ARDL(1,3,2,2,0)**
Constant	−0.709	−0.059	−3.461	−3.461***
$LnY_{i,t-1}$	−0.831***	-	−0.352***	-
$LnK_{i,t-1}$	0.163**	-	−0.002	-
$LnL_{i,t-1}$	−0.031	-	0.068	-
$LnF_{i,t-1}$	0.126***	-	−0.368***	-
$LnT_{i,t-1}$	−0.261	-	0.632***	-
$\Delta LnY_{i,t}$	-		0.037	0.090
$\Delta LnY_{i,t-1}$	0.057	0.227***	0.281***	−0.016
$\Delta LnY_{i,t-2}$	-	-	0.149*	−0.025
$\Delta LnY_{i,t-3}$	-	-	0.073	0.021
$\Delta LnK_{i,t}$	0.519	0.684*	0.139	0.158
$\Delta LnK_{i,t-1}$	-	-	0.198	−0.050
$\Delta LnK_{i,t-2}$	-	-	0.444	0.410
$\Delta LnL_{i,t}$	1.961	1.159	1.987	−0.871
$\Delta LnL_{i,t-1}$	-	-	3.826*	4.951**
$\Delta LnL_{i,t-2}$	-	-	−6.602***	−5.445***
$\Delta LnF_{i,t}$	0.207***	0.213***	-	-
$\Delta LnF_{i,t-1}$	−0.057	−0.153***	−0.193***	0.106
$\Delta LnT_{i,t}$	−1.010	−0.153***	1.012	1.522**
Trend	-	-	0.037**	−0.0009
$EC_{i,t-1}$	-	−0.989***	-	−0.660***
R^2	0.472	0.421	0.405	0.284
Statistic *F*	27.15***	-	13.26***	-
AIC	0.186	-	0.084	-
Log de vraisemblance	−441.52	−427.98	−375.44	−367.03

*,**,***significant at 10%, 5%, and 1%

the outside world does not stimulate the growth of the country, which is pushed to import more leading to a deterioration of the budget deficit.

For the equation of FDI flows to GDP per capita, the estimated coefficients of the long-term relationship are significant for labor and trade openness, but not significant for capital investment and production per capita. The work force is always negative and significant sign at the 1%. This is indicative of the problem of rising unemployment and low labor productivity, which discourage FDI. The high level of unemployment in the MENA countries, which is associated with non-skilled workers and low productivity, discourages foreign investors to enter. Given the effects of per capita output and capital, the two variables are not significant at the 5% level. Economic growth in these countries does not encourage and does not stimulate FDI flows, creating new business projects that can lead to economic growth.

Table 9 The long-term results of the ARDL approach

Variables	Ln Y	ln F
Ln Y	-	−0.005 (0.229)
Ln K	0.196** (0.088)	0.194 (0.293)
ln L	−0.037 (0.104)	1.046*** (0.388)
ln F	0.152*** (0.055)	-
ln T	−0.314 (0.352)	1.795*** (0.132)
Constant	−0.854 (2.962)	9.824*** (0.936)
Trend	-	0.037** (0.018)

*,**,***significant at 10%, 5%, and 1%. t_statistic in parentheses

Granger Causality Tests in the Short and Long Term

The VECM is constructed by restricting the behavior of long-term relationships of endogenous variables to converge their balance cointegration, while allowing short-term adjustment dynamics.

Once the cointegration relationship is established, the long-term conditional model for the vector of six variables can be estimated as follows:

$$LnY_{it} = a_{01} + \sum_{j=1}^{p} a_{1j} LnY_{it-j} + \sum_{j=0}^{q} a_{2j} LnK_{it-j} + \sum_{j=0}^{q} a_{3j} LnL_{it-j} + \sum_{j=0}^{q} a_{4j} LnF_{it-j} + \sum_{j=0}^{q} a_{5j} LnT_{it-j} + \varepsilon_{1it}$$

$$LnK_{it} = a_{02} + \sum_{j=1}^{p} a_{1j} LnY_{it-j} + \sum_{j=0}^{q} a_{2j} LnK_{it-j} + \sum_{j=0}^{q} a_{3j} LnL_{it-j} + \sum_{j=0}^{q} a_{4j} LnF_{it-j} + \sum_{j=0}^{q} a_{5j} LnT_{it-j} + \varepsilon_{2it}$$

$$LnL_{it} = a_{03} + \sum_{j=1}^{p} a_{1j} LnY_{it-j} + \sum_{j=0}^{q} a_{2j} LnK_{it-j} + \sum_{j=0}^{q} a_{3j} LnL_{it-j} + \sum_{j=0}^{q} a_{4j} LnF_{it-j} + \sum_{j=0}^{q} a_{5j} LnT_{it-j} + \varepsilon_{3it}$$

$$LnF_{it} = a_{04} + \sum_{j=1}^{p} a_{1j} LnY_{it-j} + \sum_{j=0}^{q} a_{2j} LnK_{it-j} + \sum_{j=0}^{q} a_{3j} LnL_{it-j} + \sum_{j=0}^{q} a_{4j} LnF_{it-j} + \sum_{j=0}^{q} a_{5j} LnT_{it-j} + \varepsilon_{4it}$$

$$LnT_{it} = a_{05} + \sum_{j=1}^{p} a_{1j} LnY_{it-j} + \sum_{j=0}^{q} a_{2j} LnK_{it-j} + \sum_{j=0}^{q} a_{3j} LnL_{it-j} + \sum_{j=0}^{q} a_{4j} LnF_{it-j} + \sum_{j=0}^{q} a_{5j} LnT_{it-j} + \varepsilon_{5it}$$

In addition, the shape of the VECM model, where the delayed value of residues is introduced as a term of error correction, and the dynamic model will be presented as follows:

$$\Delta LnY_{it} = a_{01} + \delta_1 ECT_{1it} + \sum_{j=1}^{p} a_{1j} \Delta LnY_{it-j} + \sum_{j=0}^{q} a_{2j} \Delta LnK_{it-j} + \sum_{j=0}^{q} a_{3j} \Delta LnL_{it-j} + \sum_{j=0}^{q} a_{4j} \Delta LnF_{it-j} + \sum_{j=0}^{q} a_{5j} \Delta LnT_{it-j} + \varepsilon_{1it}$$

$$\Delta LnL_{it} = a_{03} + \delta_3 ECT_{3it} + \sum_{j=1}^{p} a_{1j} \Delta LnY_{it-j} + \sum_{j=0}^{q} a_{2j} \Delta LnK_{it-j} + \sum_{j=0}^{q} a_{3j} \Delta LnL_{it-j} + \sum_{j=0}^{q} a_{4j} \Delta LnF_{it-j} + \sum_{j=0}^{q} a_{5j} \Delta LnT_{it-j} + \varepsilon_{3it}$$

$$\Delta LnF_{it} = a_{04} + \delta_4 ECT_{4it} + \sum_{j=1}^{p} a_{1j} \Delta LnY_{it-j} + \sum_{j=0}^{q} a_{2j} \Delta LnK_{it-j} + \sum_{j=0}^{q} a_{3j} \Delta LnL_{it-j} + \sum_{j=0}^{q} a_{4j} \Delta LnF_{it-j} + \sum_{j=0}^{q} a_{5j} \Delta LnT_{it-j} + \varepsilon_{4it}$$

Table 10 The Granger causality test

Endogenous variables	ΔLnY	ΔLnK	ΔLnL	ΔLnF	ΔLnT	Term EC	Causal decision
ΔLnY	-	8.01^{**}	18.87^{***}	12.01^{***}	13.06^{***}	-0.673^{***}	$K, L, T \rightarrow Y$
ΔLnK	5.47^{*}	-	3.82	1.19	2.48	-0.004^{***}	$Y \rightarrow K$
ΔLnL	14.14^{***}	2.05	-	-19.47^{***}	2.31	0.0001	$Y, F \rightarrow L$
ΔLnF	2.61	1.26	5.28^{*}	-	6.73^{**}	-0.008^{***}	$Y, L, T \rightarrow F$
ΔLnT	10.34^{***}	2.79	0.02	0.61	-	-0.0234^{***}	$Y \rightarrow T$

*, **, ***significant at 10%, 5%, and 1%

$$\Delta LnT_{it} = a_{02} + \delta_2 ECT_{2it} + \sum_{j=1}^{p} a_{1j}\Delta LnY_{it-j} + \sum_{j=0}^{q} a_{2j}\Delta LnK_{it-j} + \sum_{j=0}^{q} a_{3j}\Delta LnL_{it-j} + \sum_{j=0}^{q} a_{4j}\Delta LnF_{it-j} + \sum_{j=0}^{q} a_{5j}\Delta LnT_{it-j} + \varepsilon_{5it}$$

$$\Delta LnT_{it} = a_{05} + \delta_5 ECT_{5it} + \sum_{j=1}^{p} a_{1j}\Delta LnY_{it-j} + \sum_{j=0}^{q} a_{2j}\Delta LnK_{it-j} + \sum_{j=0}^{q} a_{3j}\Delta LnL_{it-j} + \sum_{j=0}^{q} a_{4j}\Delta LnF_{it-j} + \sum_{j=0}^{q} a_{5j}\Delta LnT_{it-j} + \varepsilon_{5it}$$

According to the results reported in Table 10, there is causality between GDP per capita and trade openness. In fact, trade openness induces a statistically significant positive effect on growth. This effect is justified not only by trade openness but also by the movement of capital in the form of FDI, pro-employment, and production. In addition, there is a significant causality between FDI flows, economic growth, and trade openness.

In the short term, the statistics on variables suggest that, at least at the 10% threshold, there is a two-way Granger causality between capital investment and economic growth and between labor and economic growth, unidirectional Granger causality from trade openness to FDI, FDI to economic growth, and FDI to work. By Cons, there is no Granger causality of economic growth in FDI. Generally, these results confirm those of the ARDL approach.

As for long-term results, the error correction term coefficient delayed for GDP per capita is significant at the 1% level with the expected sign, confirming the result of the cointegration test terminals 1%. Its value is estimated at−0.67 in

Table 11 The long-term relationship

Dependent variables	Ln Y	Ln K	ln L	ln F	ln T	Trend	Constant
Ln Y	-	0.205*** (0073)	−0.125 (0.084)	0.097** (0.042)	−0.424 (0.283)	0.022 (0012)	0.587 (2.534)
Ln K	0.115*** (0.041)	-	0.455*** (0.058)	−0.118*** (0.031)	−0.028 (0213)	0.052*** (0009)	15.831*** (1676)
ln L	−0.004 (0.036)	0.349*** (0.045)	-	0.053* (0.028)	2.404*** (0.129)	0.026*** (0.008)	17.133*** (1.359)
ln F	0.166** (0072)	−0360*** (0095)	0.211* (0.110)	-	1.214*** (0.365)	0.104*** (0.014)	16.55 (3.305)
ln T	−0.016 (0.010)	−0.002 (0.015)	−0.214*** (0.012)	0.027*** (0.008)	-	0.011*** (0.002)	7.512*** (0.265)

*,**,***significant at 10%, 5%, and 1%. t_statistic in parentheses

Table 11, which implies that the balance adjustment speed after a shock is high. For FDI flow, the coefficient of the delayed error correction term is significant at the 1% level with the expected sign, unfortunately that value does not converge the result of cointegration test terminals 1%.

This case can be explained by the crowding out "ripple effect" resulting from the settlement of foreign companies. This argument is indeed valid for the case of MENA countries, where local firms may be weak to respond competitively to the multinationals. Furthermore, the links between multinationals and local firms are dependent on time and domestic investor's skills. We can conclude that domestic investment promotes trade, FDI, and short-term economic growth, and it is the main engine of economic growth in MENA countries.

Lack of causality between economic growth and FDI confirms earlier results indicating that foreign investors tend to eliminate domestic firms. This could be explained by the wave of privatizations, mergers, and acquisitions that took place in these countries, especially in Tunisia in 1990 and 2000.

Concluding Remarks and Policy Implication

This work examines the dynamic causal relationship between economic growth, foreign direct investment, trade openness, labor, and capital investment in a set of MENA countries for the period 1990 to 2012. It highlights implementing ARDL cointegration model to investigate the existence of a long-term relationship between the above-mentioned series, and Granger causality in a VECM to test the direction of causality between variables. The subject deserves special attention because of the possible inter-relationships between sets with the implications of economic growth. The results show that there is a cointegration relationship between the variables specified in the model when production and FDI are dependent variables.

Also, these results indicate that there is a significant Granger causality of FDI to economic growth, but there is no significant Granger causality of economic growth

to FDI in the short and long term. They can generate significant implications and recommendations for policy-makers in MENA countries. They suggest that FDI has the expected positive impact on economic growth; these countries will have to undertake serious reforms with clear objectives and strong commitments.

In conclusion, the developing economies of the MENA region continue to be idle. Political unrest in Egypt, Libya and the escalation of the civil war in Syria, with its impact on neighboring countries such as Lebanon and Jordan, have slowed down any activity in oil-importing countries. Simultaneously, the deteriorating security situation, strikes and infrastructure issues, and the international sanctions against Iran have negative effects on oil-exporting countries. Regional growth, which fell to 1.5% in 2020, is expected to contract by 9.2% overall in 2020, down from an expansion of 1% in 2019 (The World Bank, 2020).

Countries in the MENA region have on their part redoubled efforts to strengthen institutions and improve the collection and dissemination of information and the implementation of reforms. They should continue to develop their financial markets, notably by improving the financial infrastructure, while strengthening macroeconomic management, by addressing inefficiencies in the labor and product markets, and facilitating innovation and the acquisition of knowledge and technology. Finally, it is the highest point of understanding the nature of no-tariff barriers and regulations, and the extent to which they hinder trade in no-oil goods and services.

Data Availability It 's available in the site web of word bank. It must visit the site as follow: https://data.worldbank.org/region/middle-east-and-north-africa

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