

## Openness, Economic Growth and FDI: Evidence from Iran

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**Abstract:** The study examines the impact of openness and foreign direct investment in influencing economic growth in Iran during 1970-2008, using the Bounds testing approach suggested by Pesaran *et al.* The empirical results indicate that openness is positively associated and statistically significant determinant of growth, both in short run and the long run. The result also suggested that foreign direct investment is positively associated in the short run but negatively related in the long run. Also in addition to these variables, a new variable namely exchange rate is included as a control variable. We have shown that exchange rate has positive and significant effect in the short run as well as in the long run.

**Key words:** Openness • Economic Growth • FDI • Iran

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### INTRODUCTION

The issue of foreign direct investment and openness interacting with economic growth in developing countries has become increasingly important because often they have been referred to as the “engine of growth”. Relevant literature on this issue might be divided into two groups. The first, Das [1]; Din [2]; Rodriguez-Clare [3], Balasubramanyam, Salisu and Sapsford [4], Borensztein, De Gregorio and Lee [5] argue that based on growth theory in which FDI is introduced as one of the factors explaining output growth, stressing the importance of knowledge spillovers or technology transfer in addition to capital formation. Technology transfer occurs when the advanced technologies embodied in FDI are transferred to domestic plants through the presence of multinational firms. According to new growth theory, such spillover affects host economies through changes in the nature of market concentration as well as through transfer of technological, managerial and financial practices in the industries that the multinational firm enters. These considerations lead to the hypothesis of FDI-led growth.

The second, Markusen [6] focuses on the importance of factors explaining the existence of multinational firms, which suggests that FDI is attracted to host countries because of the possibilities of higher returns. Viewed as a substitute for domestic capital, FDI inflows increase with higher domestic demand for capital generated by

economic growth in host countries. Expanding domestic markets also make it possible for multinational firms to exploit economies of scale. In short, better economic performance in host countries provides foreign investors with a better investment environment and greater opportunities for making profits, suggesting the hypothesis of growth-driven FDI [7].

Overall, Barrell and Pain, [8] reveals that empirical evidence in the last few decades indicates that FDI flows have been growing at a pace far exceeding the volume of international trade. Between 1975 and 1995, the aggregate stocks of FDI rise from 4.5% to 9.7% of world GDP, with sales of foreign affiliates of multinational enterprises substantially exceeding the value of world exports.

Expectedly, the role of exports in economic performance of developing countries has become one of the more intensively studied topics in recent years. The major impetus for most studies on this relationship is the export-led growth (ELG) hypothesis which interestingly represents a dominant explanation in this context. The ELG hypothesis states that the growth of exports has a favorable impact on economic growth. However, the empirical evidence on the relationship between exports and growth is mixed. The liberalization process in developing countries has increased not only trade but also FDI flows. Thus, FDI has also become an important link in the export-growth relationship [9].

In conclusion international trade or trade liberalization could be another important channel for promoting growth, as it increases the size of the market and allows the country to use a large variety of technologically advanced physical capital, which enhances the productivity of its own resources. These considerations would suggest the inclusion of both trade components and FDI as arguments in the production function, besides labor and domestic capital.

The rest of the paper is divided into sections as follows: section two comprises a brief survey of related literature and it addresses mainly the theoretical and empirical issues. Section three considers methodology and data while the fourth section is discussion of empirical results. Section five is the last section and is made of conclusion and discussion.

**Literature Review:** In this context, international trade or trade liberalization could be another important channel for promoting growth, as it increases the size of the market and allows the country to use a large variety of technologically advanced physical capital, which enhances the productivity of its own resources.

There is a number of ways through which Trade flows and FDI can be linked. Goldberg and Klein [10] asserted that FDI may encourage export promotion, import substitution, or greater trade in intermediate inputs which often exist between parent and affiliate producers. The orientation of most investments by multinational firms is towards exports and this may most likely serve as a catalyst for the integration of the FDI host economy to a global production network in sectors in which it may formerly have had no industrial experience. Rodriguez-Clare; Calderón, Mortimore and Peres [11] argue that the very nature of the activities of multinational enterprises in Mexico could encourage the expansion of its industrial exports. These studies clearly indicate that FDI could be associated with export trade in goods and the host country may enjoy an FDI led export growth. Goldberg and Klein do not find evidence to support a significant link between FDI and aggregate exports in Latin America. According to them, the trade-promoting effects of FDI appear to be weak or insignificant with regard to Latin American trade with the United States and Japan. Their results also failed to find a systematic linkage between sectoral trade and FDI in Latin America.

The generation of productivity spillovers is one possible channel through which FDI can affect growth. Blömstrom and Persson [12], Blömstrom [13], Blomström

and Wolf, [14] found evidence that FDI has led to significant positive spillover effects on the labour productivity of domestic firms and on the rate of growth of domestic productivity in Mexico. However, Kokko, Tansini and Zejan [15] cautioned in the case of Mexico and Uruguay, that spillovers are difficult to identify in industries where foreign affiliates have much higher productivity levels than local firms. De Gregorio [16] contributes to the debate on the importance of FDI by noting that FDI may allow a country to bring in technologies and knowledge that are not readily available to domestic investors and in this way increases productivity growth throughout the economy. Dolan and Tomlin [17] found that FDI flows were positively associated with growth of per capita income but that the stock of FDI had a negative effect on growth. This result is supported by Saltz [18] who confirms a negative stock effect for a sample of 75 developing countries for the period 1970-80. Balasubramanyam, Salisu and Sapsford analyses how FDI affects economic growth in developing economies. Using cross-sectional data and OLS regressions, they found that FDI has a positive effect on economic growth in host countries with an export promoting strategy but not in countries using an import substitution strategy. The results obtained by David Barlow [19], Panagariya [20], Chui, Levine, Murshed and Pearlman [21] are mixed. While Barlow discovered that the level of trade liberalization is found to raise the growth rate, particularly in the early part of the transition and for the countries nearest to the European Union, Panagariya found mixed results between countries, while there are countries enjoying good growth in their economic performance due to trade openness such as Botswana, Malta, Singapore and Hong Kong which he called miracles, at the same time there are countries with negative growth like Kuwait, Liberia, UAE which he called debacles.

Since it is a known factor that trade openness is an important variable of growth as claimed by Dexter, Levi and Nault [22], the export variable with trade openness was replaced. In the survey of how large is International Trade's effect on Economic Growth which was done by Lewer and Van Den Berg [23] reveals that many empirical studies are surprisingly consistent in terms of the size of the relationship. A percentage point increase in the growth of exports is associated with a one fifth percentage point increase in economic growth. Given the power of compounding, the effect is very important for human welfare.

**Methodology and Data**

**The Economic Growth Model:** In this study, the real per capita Gross Domestic Product (RGDPC) growth is used as a measurement of economic growth. (dependant variable) with the trade openness (OPEN), real effective exchange rate (RER), real foreign direct investment (FDI) as the independent variables. An autoregressive distributed lag (ARDL) model, more explicitly bounds test approach as introduced by Pesaran et al [24] is used to test and examine the variables.

- $RGDPC_t = f(FDI_t, OPEN_t, RER_t, )$  or more explicitly stated as unrestricted error correction model (UECM) as below:

$$\begin{aligned} \Delta RGDPC_t = & \beta_0 + 1RGDPC_{t-1} \\ & + \beta_2 FDI_{t-1} + \beta_3 OPEN_{t-1} + \beta_4 RER_{t-1} + \\ & \sum_{i=1}^{\alpha} 5_i \Delta RGDPC_{t-i} + \sum_{i=0}^b 6_i \Delta FDI_{t-i} + \\ & \sum_{i=0}^c 7_i \Delta OPEN_{t-i} + \sum_{i=0}^d 8_i \Delta RER_{t-i} + u_t \end{aligned} \quad (1)$$

Where the RGDPC is the real Gross Domestic Product per capita, FDI is the real Foreign Direct Investment inflow, OPEN is the level of openness which is the ratio of total trade (export plus import) over real GDP, Real Effective Exchange Rate (RER) and  $\Delta$  is the first difference operator.

For the examination of long- run relationship the bound cointegration test based on critical values taken from Pesaran will be used with the null and alternative hypotheses are as below:

- $H_0 = \beta_1 = \beta_2 = \beta_3 = 0$  (no long-run relationship)
- $H_1 = \beta_1 \neq \beta_2 \neq \beta_3 \neq 0$  (a long run relationship)

**Description of Sources of Data:** Annual data for the period 1970-2008 was collected from the International Monetary Fund (IMF), The RGDPC growth data was obtained from the first difference in the logarithm of real GDP. The exchange rate was the real effective exchange rate (RER). For the level of openness, the export and import data was totalled and divided with GDP to obtain the index. As for the real Foreign Direct Investment (FDI), again the logarithm of the raw data obtained of the inflow of funds was used.

Table 1: Results of the Unit Root Test for the dependent variable (DF/ADF)

Variables	DF/ADF							
	Level				1st difference			
	Constant	k	Trend	k	Constant	k	Trend	k
GDP	-1.217339	0	-2.65439	0	-4.669541*	0	-4.534774*	0

Note : Asterisk (\*) denote statistically significant at the 5% level

Table 2: The Estimated ARDL Model Based on Equation (1)

Variable	Coefficient	Std. Error	T-Statistic	Prob
RGDPC(-1)	-0.393825	0.169944	-2.317376**	0.0374
FDI(-1)	-0.031527	0.011756	-2.681797**	0.0188
OPEN(-1)	0.204998	0.064705	3.168179***	0.0001
RER(-1)	0.358881	0.100932	3.168179***	0.0001
$\Delta$ ( RGDPC (-1))	0.136645	0.103827	1.316079	0.2109
$\Delta$ ( RGDPC (-2))	-0.154651	0.104036	-1.4865511	0.1610
$\Delta$ ( RGDPC (-3))	0.198913	0.154720	1.285631	0.2210
$\Delta$ (FDI)	0.025032	0.010486	2.387121**	0.0329
$\Delta$ (FDI(-1))	0.043058	0.011153	3.860542***	0.0020
$\Delta$ (FDI(-2))	0.031764	0.009159	3.467906***	0.0042
$\Delta$ (OPEN)	0.470668	0.055826	8.430990***	0.0000
$\Delta$ (OPEN(-3))	-0.078358	0.081059	-0.966677	0.3513
$\Delta$ (RER)	0.514488	0.072112	7.134574***	0.0000
C	-2.374982	0.482812	-3.403893***	0.0047
R-squared	0.957124	Mean dependent var		0.040620
Adjusted R-squared	0.914248	S.D. dependent var		0.062524
S.E. of regression	0.018309	Akaike info criterion		-4.856689
Sum squared resid	0.004358	Schwarz criterion		-4.184774
Log likelihood	79.56530	F-statistic		22.32311
Durbin-Watson stat	1.425233	Prob(F-statistic)		0.000001

$\Delta$  denotes first difference

Note : \*\*\*,\*\* and \* denote significant at 1%, 5% and 10% levels

**Discussion of Empirical Results:** A unit root test was done for the dependent variable using the Augmented Dickey-Fuller (ADF) test to satisfy the pre-requisite condition of the dependent variable being non stationary or contains a unit root in I(1) and stationary at I(0) as prescribed by Pesaran.

4.2 :Bounds Test for Cointegration Analysis Based on the Equation (1)

Critical value	Lower Bound Value	Upper Bound Value
1%	2.74	5.06
5%	2.86	4.01
10%	2.45	3.52

Computed F-statistics : 4.432152 (significant at 0.05 marginal level)

For the examination of long- run relationship the Wald test (F-statistic) was calculated by imposing restrictions on the estimated long-run coefficients as explained previously in this paper F-statistic is 4.432152 which is greater than the upper bound value, thus we can easily reject H0 and conclude that there is a long run relationship between the dependent variables and the economic growth.

Table 3: Long run Estimated Coefficient

Variable	Coefficient
OPEN	0.63568***
FDI	-0.07200**
RER	0.82127***

Note :\*\*\* and \*\* denote significant at 1 % level and 5% respectively

Table 4: Short run estimated coefficients - Wald Test

Variable	Coefficient
OPEN	0.39231***
FDI	0.09985***
RER	0.51448 ***

Note :\*\*\* denote significant at 1 % level

**The Long Run Relationship Thus Can Be Written as Below:**

$$GDP_t = -2.374982 + 0.63568 OPEN_t + 0.82127 RER_t - 0.07200 FDI_t$$

The equation indicates that variables such as OPEN, RER are positively related while FDI has an inverse relation. OPEN’s sign is concurrent with economic theories and past findings, same goes to RER sign. FDI has a negative sign in the long run as opposed in the short run, which means that Iran as a host country benefits from the capital injection in the short run but profit withdrawal might contribute to the long run negative sign .

**DISCUSSION AND CONCLUSION**

The result of this research shows that all the independence variables chosen, FDI, OPEN, RER, significantly determine the economic growth in Iran for the chosen period 1970 to 2008, all the independent variables are significant both in the short run and long run. The results are concurrent with most of the literature reviewed and theoretical framework. OPEN is significantly positive related to economic growth and proves that to the most widely held beliefs in the economic profession,.

Indeed, opposing the neoclassical growth models, whereby trade openness have no impact on the long-run growth rate of an economy the results proves otherwise, that is, impact of level of trade openness on economic growth proves to be a important and significant variable in determining economic growth both in the short run as well as in the long run, positively. All the independence variables are found to be significantly stimulating growth for both the short as well as the long run except for the FDI as mentioned, stimulates growth in short run but works the opposite direction in the long run. The situation of the determinants of growth for Iran is found to be generally similar to most of the other nations in the world.

The positively significant sign of trade openness, both in the short run and long run may also signal its impact on increasing a nation’s income and, as the export-led growth hypothesis explains, that export contributes positively to economic growth by facilitating the exploitation of economics of scale, relieving the binding constraint to allow increases in the import of capital and intermediate goods enhancing efficiency through increased competition and promoting the diffusion of knowledge through learning by doing.

The results of this study will strengthened the view that openness to trade will continue to be viewed as a key determinant of economic growth. Siding with Sjöholm [25] who found that trade does not only increase a nation’s productivity, it also increases the nation’s technology standard through increased competitive pressure, embodiment in imports and knowledge transfer through commercial contacts. The result is echo’s Baharumshah and Rashid [26] who outlined that degree of openness of a country will affect the speed of economic growth of that nation. They also quoted Bhagwati [27] who brought up the third hypothesis of many studies in trade and economic growth where increased trade produce more income and more income will facilitate trade which is known to be “virtuous cycle\_h .

As further supported by Dollar and Kraay [28] who outlined that trade openness is a reasonable reason in accelerating growth as the more rapid growth may be a transitional effect rather than a shift to a different state growth rate. They also single out the OPEN one-third of developing countries in terms of trade to GDP over the past 20 years. They further mentioned that expectation for greater openness would improve the material live of the poor, which in turn will to GDP growth as a whole.

The results of this study is also like to Wong and Chong [29] who outlined that Asian countries experiencing rapid growth had great influences on the trade policies of many developing countries.

As for the FDI, which is found to be significant positively in the short run, this is not an isolated finding. Similar results were obtained by Hermes and Lensink [30], who found that FDI only enhance growth once a country has reached a given threshold of human capital and financial market development and for most developing this threshold has yet to be attained. Carkovic and Levine [31] also share the same finding whereby the impact of the exogenous component of FDI on GDP growth is not significantly different from zero.

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