

Relationship Between Trade Openness and GDP Growth a Panel Data Analysis

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Abstract: The present study examines the relationship between openness (trade-GDP ratio) and growth. We categorized the selected countries (Middle-East and North Africa countries), MENA, in two different groups: Rich or poor countries and open or closed economies. Our cross-country panel data analysis of a sample of 19 MENA countries is shown that for 11 rich and open countries a real higher growth is associated with a higher trade share. Time series study for individual country experiences showed that 5 countries among sample countries (Algeria, Jordan, Kuwait, Lebanon and Syria) had significant long-term relationship between their openness and growth during the 1980-2005. All these countries are found as open economies in our study, but not all of them as rich countries.

Key words: Growth • Openness • Liberalization • Trade share • Panel data • MENA countries

INTRODUCTION

Do open economies grow faster than closed economies? Almost all empirical growth studies have provided an affirmative answer to this question. The reason for this strong bias in favor of trade liberalization is partly based on the conclusions of a wide range of empirical studies, which claimed that outward-oriented economies consistently have higher growth rates than inward-oriented countries. It is also partly due to the tragic failures of import-substitution strategies, especially in the 1980s and overstated expectations from trade liberalization. This is probably best described that “just as the advantages of import-substitution policies were overstated in an earlier era, today the benefits of openness are oversold routinely in the policy-relevant literature and in the publications of the World Bank and the IMF.” [1]. It is, however, very difficult to understand this unconditional optimism in favor of trade liberalization among the economics profession and in policy circles. Although there is a near consensus about the positive association between trade flows and growth, the theoretical growth literature, which studied the growth effects of trade restrictions reported that these effects are very complicated in the most general case and the results are mixed as to how trade policies play a special role in

economic growth. Furthermore, the fact that empirical studies describe openness very differently makes the classification of countries according to their level of openness a formidable task. Hence, it is not a surprise that use of different measures obtains very diverse openness rankings among countries.

The major developments and structural changes in MENA countries have been highlighted and a noticeable growth during 1990 decade has been remarked. These conclusions are reached starting from the record growth rates in market capitalization, the number of listed companies, the value traded and the shares traded in most of the MENA capital markets. It is concluded that to support the growth in capital market and attract more local and foreign investors, MENA markets would need to continue to incorporate changes in the procedures, laws as well as the professional infrastructure in the financial market [2].

This study seeks to answer the question if there is any link between trade openness and growth? First we present some previous empirical and theoretical works in this field. Then we will review the methodology of analyzing the panel data. Finally we present our empirical findings based on panel data. Concluding observations and founding tables are presented in the last section.

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The relationship between trade openness and growth is a highly debated topic in the growth and development literature. Yet, this issue is far from being resolved. Theoretical growth studies suggest at best a very complex and ambiguous relationship between trade restrictions and growth. The endogenous growth literature has been diverse enough to provide a different array of models in which trade restrictions can decrease or increase the worldwide rate of growth [3-7]. Note that if trading partners are asymmetric countries in the sense that they have considerably different technologies and endowments, even if economic integration raises the worldwide growth rate, it may adversely affect individual [8-12].

It is worthwhile to note that the theoretical growth literature has given more attention to the relationship between trade policies and growth rather than the relationship between trade volumes and growth. Therefore, the conclusion about the relationship between trade barriers and growth cannot be directly applied to the effects of changes in trade volumes on growth. Even though these two concepts, trade volumes and trade restrictions, are very closely related, their relationship with growth may differ considerably. This is because there are several other very important factors that affect a country's external sector, such as geographical factors, country size and income. In other words, one should be as clear as possible about which openness measure he uses and what are the exact mechanisms which it affect the growth. We shall discuss each openness measure used in this study later in the section.

In the theory of international trade, the static gains from trade and losses from trade restrictions have been examined thoroughly. Yet, trade theory provides little guideline as to the effects of international trade on growth and technical progress. On the contrary, the new trade theory makes it clear that the gains from trade can arise from several fundamental sources: differences in comparative advantage and economy-wide increasing returns.

Some of the new endogenous growth theories suggest that trade policy effects long-run growth through its impacts on technological change. In the model of this tradition openness to trade provides access to imported inputs.

It has been pointed out that intervention in trade could facilitate long-run growth if protection encourages investment in research-intensive sectors [13]. It is shown that even if the trading partners have considerably different technologies and endowments, economic

integration may adversely affect individual countries even if it raises the worldwide growth rate [5,6,10,11,12,14]. In a recent study, a large number of openness measures for a cross-section of countries over the last three decades is used. A significant positive correlation is found between trade shares and growth. [14].

In another study, the relationship between openness and growth is examined. It shows that for only 11 rich and highly trade-dependent countries a higher real growth is associated with a higher trade share. Time series study of individual country experiences shows that the majority of countries have no positive long-term relationship between openness and growth during the selected time period. The study shows that only middle income group exhibited a positive long run relationship. [15].

Methodology and Data: Increased trade openness is often considered in the sense of an increase in the size of the country's traded sector in relation to total production. It is an acceptable proxy for trade liberalization. In fact increasing trade openness often reflects the success of trade liberalization policies. So we shall use trade (export plus import) as a percentage of GDP (TRDGDP) as the measure of trade openness. The relevant data are collected from HDI annual magazines. We have chosen MENA (middle-east and North Africa countries). The list of countries and the relevant data averages over the period 19970-2005 are presented in Table 1. two countries (Iraq and Gaza) are omitted because of the lack of the data. The sample of 19 countries is divided into different groups on the basis of two rules of thumb. One is the average share of trade in GDP (TRADGDP) and the other is the average of GDP per capita (measured in purchasing power parity in 2000 dollars, 2000\$ USA), PCGDP (over the period 1997-2005). On the basis of TRDGDP countries are categorized as being a closed economy (with average TRDGDP <50 per cent). And countries as highly trade-dependent open Economy (with average TRDGDP >50 per cent). On the basis of PCGDPP the countries are further classified as Rich (PCGDPP > \$5000)-countries belong to this group (countries belonging to this group are marked by an asterisk "**") and poor.

We have considered three alternative models between the rates of growth of the real GDP per capita PCGDPP and trade openness index (TRDGDP): between effects (BE) models, the country fixed-effects (FE) model and the random-effects (RE) models. In the BE model, we take the average of each variable for each country cross time and running a regression on the data set of averages (for a sample of 19 countries, 19 observation of TREGDP

Table1: Trade Openness, GDP Per Capita and Its Growth Rate, 1997-2005 Selected Middle East and North Africa

Groups/countries	PCGDPP (1997-2005) Averages	PCGDGP (1997-2005) Averages	TRDGDP (1997-2005) Averages
Closed Economies			
Egypt	3664	4.60	46
Iran*	6392	4.24	49
Open Economies			
Algeria*	5404	1.12	59
Bahrain*	16818	3.92	143
Djibouti	1989	10.13	96
Emirates*	20875	3.87	144
Israel*	20402	4.80	82
Jordan	4150	6.37	118
Kuwait*	20268	2.40	91
Lebanon	4923	6.20	57
Libya*	7683	6.20	63
Malta*	16513	6.22	174
Morocco	3762	4.10	67
Oman*	12940	6.43	93
Qatar*	20732	4.32	91
Saudi Arabia*	12356	5.85	70
Syria	3561	3.83	69
Tunisia*	6608	5.92	93
Yemen	853	2.30	77

Source: Research findings

*: Rich countries with 1997-2005 average per capita GDP > \$5000 (internationally comparable purchasing power parity 2000 dollar)

PCGDPP = per capita gdp in purchasing power parity constant(2000) international US \$

PCGDGP = growth in real GDP per capita

TRDGDP= Trade (exports plus imports) as percentage of GDP, trade openness index

Countries are categorized as " closed economy " if their TRDGDP < 50 percent. All others considered as open economy countries.

and PCGDGP). This averaging procedure results in loss of information (one observation per country rather than 9 observations per country over the period 1997-2005. we have estimated the BE model and found that across the countries if we use different dummies for different groups as defined above, rich and poor or closed or open, The FE model is designed to control for omitted variables that differ across countries but are constant over time. This is equivalent to generate dummy variables for each country's case and include them in a standard linear regression to control for these fixed-country effects.

The RE model is used if there is a reason to believe that some omitted variables may be constant over time but vary between cases and others may be fixed between cases but vary over time. The Hausman test has been done to choose the appropriate model. It strongly supports the RE model in the most of the cases. That means the standard regression analysis with country dummies (the FE model) is not appropriate (the residual variance across the countries is not zero in the panel regression.

The estimates show that the positive relationship between trade openness and growth at the cross-country average model (the BE model) also holds good in our panel data analysis over the period 1997-2005 across the same sample 19 countries.

Long-term Relationship Between Trade Openness and Growth:

The utility of cross section studies lies on the fact that the lack of enough observation per country can be overtime by increasing the number of the countries in the study. Even one observation of a country can be utilized. But it is always doubtful how far it gives a casual relationship among the variables under study. A cross section panel regression analysis often tries to include as many countries possible some studies cover(say) 60 countries, some covers 80 countries and all the countries covered in the study are implicitly given the same weight (it is also difficult to devise weighting system).

When there are enough data for each country, we can provide a policy prescription for particular cases. We can also conduct the above panel regression

analysis for each group of countries as presented in previous sections. (Rich or poor and open or closed countries).

For examining long-run relationship between two time-series variables requires a test of unit root (how many times the series are to be differenced to attain stationary property. But the problem is that different tests of unit root often give different results. Here we use the Autoregressive Distributive Lag (ARDL) approach to co-integration developed that does not require such pre-testing and "data-mining"[16]. This technique can be used to test for the existence of a long run relationship between two variables irrespective of whether they are stationary or not (having unit root or not). We shall use this ARDL technique to ascertain the existence of a long run equilibrium relationship between trade openness and growth.

In the ARDL approach the following equation is fitted:

$$Y_t = a + \sum_{i=1}^a b_i Y_{t-i} + \sum_{j=0}^p c_j X_{t-j} \quad (1)$$

Where Y_t is the growth rate of real GDP per capita (PCGDP) in period t , X_t is the trade openness index-share of total trade in GDP (TRDGDP) in period t and p and q are unknown lags to be determined by various criteria.

We have used four alternative criteria for choosing the values of the lags (p and q) of the ARDL (p,q) model: R-Bar Square Criteria (RBSQ), Akaike Information Criteria (AIC), Schwarz Bayesian Criteria (SBC) and Hannan-Quinn (H-Q) criterion. The results of these long-term coefficients for different countries are presented in Table 3.

We consider the long-term relationship between openness and growth for each country during the period 1980-2005 by using ARDL models. The four alternative criteria have almost the same result in choosing the value of the lags (p and q).

If we rely on the R-BAR, AIC and SBC only three countries (Algeria, Kuwait and Lebanon) show significant relationship between openness and growth. This relationship appears in positive. Other sample countries have no significant relationship in the 1980-2005 periods.

If we rely on H-Q criteria for choosing value of lags, only one country (Syria) adds to the list of the positive relationships.

RESULTS AND DISSCUSION

The present study examines the relationship between trade liberalization / trade openness and real growth rates. The share of total trade (exports plus imports) in GDP (trade-share) is taken as the measure of trade openness. The relevant data are collected from HDI annual magazines. We have chosen MENA (middle-east and north Africa countries). Two countries (Iraq and Gaza) are omitted because of the lack of the data.

In Table 1 the sample of 19 countries is divided into different groups on the basis of two rules of thumb. One is the average share of trade in GDP (TRADGDP) and the other is the average of GDP per capita (measured in purchasing power parity in 2000 dollars, 2000\$ USA), PCGDP (over the period 1997-2005). On the basis of TRDGDP countries are categorized as being a closed economy (with average TRDGDP <50 per cent).And countries as highly trade-dependent open Economy

Table2: Trade openness and growth of the Middle East and North Africa 1997-2005 panel data analysis

I. Cross-country BE model						
Regressors	I	II	III	VI	V	VI
Whole samples (19 countries)						
A (intercept)	2.91*	3.74*	3.38*	2.99*	-1.39	9.39
TRDGDP	0.02*	0.02*	0.02*	0.02*	0.08*	-0.10
Intercept Dummy Rich (D _i)		-0.32		-0.30	5.30*	
Slope Dummy Rich (SD _i)					-0.07*	
Intercept Dummy Openness (D _i)		-0.85	-0.84			-6.85
Slope Dummy Openness (SD _i)						0.13
R Sq.	0.08	0.1	0.1	0.09	0.25	0.1
F-test	15.6	6.23	8.39	8.17	18.65	5.99

Source: Research findings

* Means statistically significant in 95% level

II. Panel data RE model

Regressors	I	II	III	VI	V	VI
Whole samples (19 countries)						
A (intercept)	1.43	2.63	2.42	1.63	0.41	-5.62
TRDGDP	0.03	0.04	0.04	0.04	0.05	0.21
Intercept Dummy Rich (D _i)		-1.71		-0.68	0.91	
Slope Dummy Rich (SD _i)					-0.02	
Intercept Dummy Openness (D _i)		-0.70	-1.68			6.55
Slope Dummy Openness (SD _i)						-0.17
R Sq.	0.01	0.01	0.01	0.01	0.01	0.01
F-test	2.30	2.08	2.16	2.23	5.70	1.89

Source: Research findings

* Means statistically significant in 95% level

Rich, Poor, Open and Closed countries

Regressors	Rich Countries	Poor countries	Open Economies	Closed Economies
Whole samples (19 countries)				
A (Intercept)	-25.04	-1.50	1.15	-32.76
TRDGDP	0.31 *	0.07	0.04	0.36
R Sq	0.1	0.02	0.01	0.13
Husman-test	-	0.70	2.70	-

Source: Research findings

* Means statistically significant in 95% level

Open and Rich and other countries

Regressors	Open and Rich countries	Other countries
Whole Sample (19 countries)		
A (intercept)	1.15	1.09
TRDGDP	0.3 *	0.03
R Sq	0.01	0.01
Husman-test	-	1.52

Source: Research findings

* Means statistically significant in 95% level

Table 3: Long-term relationship between Trade Openness and real Growth Rate, 1980-2005: Selected Middle East and North Africa (Microfit results)

Groups/countries	R-BAR	AIC	SBC	H-Q
Closed Economies				
Egypt	-0.30(3,5)	-0.26(5,5)	-0.26(5,5)	-0.26(5,5)
Iran	0.20(5,4)	0.03(5,5)	0.03(5,5)	0.03(5,5)
open economies				
Algeria	0.22*(0,0)	0.22*(0,0)	0.22*(0,0)	0.22*(0,0)
Bahrain	0.21*(7,3)	1.68(7,7)	1.68(7,7)	1.68(7,7)
Djibouti	-0.26(1,2)	-0.26(1,2)	-0.26(1,2)	-0.26(1,2)
Emirates	-0.34(5,5)	-0.34(5,5)	-0.34(5,5)	-0.34(5,5)
Israel	0.02(4,4)	0.01(4,5)	0.01(4,5)	0.01(4,5)
Jordan	0.04(5,3)	0.04(5,3)	0.04(5,3)	0.04(5,3)
Kuwait	0.79*(5,5)	0.79*(5,5)	0.79*(5,5)	0.79*(5,5)
Lebanon	0.42*(3,0)	0.42*(3,0)	0.42*(3,0)	0.42*(3,0)
Libya	-0.21(0,2)	-0.34(3,3)	0.00(0,0)	-0.34(3,3)
Malta	0.05(0,2)	0.05(0,2)	0.05(0,2)	0.05(0,2)
Morocco	-0.04(3,3)	-0.04(3,3)	-0.04(3,3)	-0.04(3,3)
Oman	-0.66(0,1)	-0.66(0,1)	-0.66(0,1)	-0.66(0,1)
Qatar	1.85(0,0)	1.85(0,0)	1.85(0,0)	1.85(0,0)
Saudi Arabia	-0.03(1,2)	-0.03(1,2)	-0.03(1,2)	-0.03(1,2)
Syria	0.77(1,1)	0.77(1,1)	0.77(1,1)	0.73*(2,1)
Tunisia	-0.20(0,0)	-0.20(0,0)	-0.20(0,0)	-0.20(0,0)
Yemen	-0.02(2,2)	-0.02(2,2)	-0.02(2,2)	-0.07(1,2)

Source: Research finding

* Means statistically significant in 95% level

(with average TRDGDP>50 per cent). On the basis of PCGDPP the countries are further classified as Rich (PCGDPP>\$5000)-countries belong to this group (countries belonging to this group are marked by an asterisk "**") and poor.

Running regressions for these groups in Table 2 show that for 11 rich and open countries a real higher growth is associated with a higher trade share. In the other hand in these countries GDP growth follows the average share of trade in GDP. But for other 8 countries there was no significant relationship between GDP growth and TRDGDP.

We resort to time series study for individual country experiences in Table 3. It shows that the majority of the sample countries have no significant long-term relationship between their openness and growth during the 1980-2005. Only four countries (Algeria, Kuwait, Lebanon and Syria) show significant relationship between openness and growth. This relationship appears in positive. It means GDP growth follow TRDGDP in long run period. Other sample countries have no significant relationship between GDP growth and TRDGDP in the 1980-2005 periods.

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