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DOES TRADE OPENNESS FACILITATE ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM AZERBAIJAN

Ping Guo
College of Economics and Trade, Hunan University, Changsha, People's Republic of China
gping1963@163.com

Oruj Gasimli
College of Economics and Trade, Hunan University, Changsha, People's Republic of China
orucqasimli@yahoo.com

Guoqin Pan
College of Economics and Trade, Hunan University, Changsha, People's Republic of China
guoqinpan@126.com

Abstract

This study explores the effect of trade openness on economic growth in Azerbaijan. However, to trace the individual effect of trade openness with respect to exports and imports, this study decomposes trade openness into exports openness and imports openness so that it will be cleared whether trade openness with respect to exports or imports played an important role in the economic growth or both are equally important for economic growth in Azerbaijan. For this purpose, exports and imports openness are incorporated in the Cobb-Douglas production function. The variables of the study are cointegrated in the long run. This study finds that labor force, capital, and exports openness positively contributed to economic growth whereas imports openness deteriorated the economic growth during the study period. These results are not just valid in long run but in the short run as well.

Keywords: Economic growth, exports openness, imports openness, cointegration, Azerbaijan

INTRODUCTION

Trade is a vital factor of economic growth as it integrates an economy with rest of world. It helps in efficient distribution of resources in the economy and thus leads to economic growth. Trade also helps technological progress of the economy through the diffusion of knowledge and brings optimization of production process as it promotes competition not just in the domestic market but in the international market as well (Grossman and Helpman, 1991; Bernard and Jensen, 2004; Rodríguez and Rodrik, 2001).

Exports are important component of gross domestic product (GDP) so expansion in exports directly contributes to economic growth. It brings foreign exchange earnings to the economy thus; allowing importing more and more capital and intermediate goods that could lead to economic growth. On the hand, if an economy exports are low it will have low purchasing capacity in foreign market and that economy will not be able to import enough capital goods to boost its economic growth (Han&Haq, 2017). Similarly, fluctuations in the exports earning creates uncertainties which in return affect the level and efficiency of investment domestically and would have adverse effect on the economic growth. Besides, more exports allow developing and small economies to get benefit from the economies of scale (Helpman&Krugman, 1985).

One way to measure openness index of the economy is the ratio of total exports to GDP so; a greater value of this index would indicate that the economy is more open to the rest of world. However, this ratio alone is not a good sign of the openness as large economies (size and population) may have lower value of exports to GDP ratio as it would absorb more of its domestic production instead of exports. But, still one can gauge the openness through this index as lower value of the index would indicate a trade restricted economy (Pereira and Xu 2000).

Four prominent views are established in empirical literature about the nexus between exports and economic growth. First, increase in exports leads to economic growth (Awkose, 2003; Tang & Lai, 2011; Saaed&Hussain; 2015). Second, economic growth is responsible for expansion of exports in the economy (Kaldor 1967; Shan &Tian, 1998). Third, a feedback relationship exists between exports and economic growth (Wernerheim, 2000; Hatemi-J., 2002; Liu et al., 2002). Fourth, exports and economic growth does not cause each other both are results of development and technological advancement (Yaghmaian, 1994). Aicha (2015) and Han and Haq (2017) did not find causality in any direction between exports and economic growth in the long run.

Endogenous growth models provide theoretical background for the role of imports in economic growth. Imports enable the economy to get access to advance and modern technology and knowledge from advanced economies to less advanced economies. Foreign

technology can play an important role in the development of an economy as it could increase labor productivity (Grossman &Helpman, 1991; Lee, 1993; Baharumshch& Rashid, 1999; Mazumdar, 2001). The new technology maybe embodied in imports in the form of capital and intermediate goods such as machine and equipment thus; focusing on only exports role in the economic growth and leaving aside the importance of imports maybe misleading to determine the role of foreign trade in economic growth (Awkuse, 2007). Imports and economic growth causing each other (Kogid et al., 2011; Aicha, 2015) while Saaed and Hussain (2015) concluded that economic growth leads to more imports, imports causing exports and exports causing economic growth thus proves that imports stimulate economic growth indirectly. Similarly, Han and Haq (2017) confirmed that a unidirectional causality exits from economic growth to imports.

This research study is designed to explore the role of trade openness in economic growth of Azerbaijan. So for this purpose, this study decomposed the trade openness into export openness and import openness so that it will be cleared whether trade openness with respect to exports or imports played an important role in the economic growth or both are equally important for economic growth in Azerbaijan. In order to achieve this main objective of this current study, an empirical model is developed that is based on Cobb-Douglas production function. This study adds to trade openness-economic growth nexus literature the case of a transitional economy, Azerbaijan. There are two reasons that make this study a novel study in the literature regarding trade openness-economic growth nexus. First, this study is of unique in the sense that nobody analyzed the effect of trade openness on economic growth for such an extended time period. Second, empirical studies are limited that examined the effect of exports and imports openness individually. Thus, the empirical model in case of this study is as follows:

$$GDP = f(LF, K, XO, MO)$$

Taking into account the time series nature of the data and taking the natural log the Eq. 1 turns out to be as in Eq. 2:

$$logGDP_t = b_0 + b_1 logLF + b_2 logK + b_3 logXO + b_4 logMO + u_t$$

Whereas; GDP, LF, K, XO, and MO stands for gross domestic product, labor force, capital formation, exports openness, and imports openness respectively. The coefficient of the respective variables is represented by b_i , log represents natural log, t represents time period and u is error term.

The rest of paper is organized in the following structure. Second section of the paper explores about the research methodology and third section explains the empirical results. The last section concludes the paper.

RESEARCH METHODOLOGY

Time series data will be analyzed in this study. The data on exports openness (ratio of exports to GDP), imports openness (ratio of imports to GDP), real GDP, labor force, and capital is being collected from World developing indicators, World Bank online database. Azerbaijan joined Economic Cooperation Organization in 1992, became member of IMF and World Bank in 1992, and joined World Trade Organization (WTO) in 1993 as observer. These steps from the government ensured that Azerbaijan wants to enhance trade relations with rest of world to reap the fruits of foreign trade thus; quarterly data from 1993 to 2016 will be analyzed to analyze the effect of trade openness on economic growth in Azerbaijan. Time maybe also a factor of time series data and maybe time series data is trended so this study will apply Dickey-Fuller GLS test (1996) test for this purpose. If data is influenced by time factor it means that time series has a unit root so we cannot go for ordinary regression analysis (OLS). The problem of unit root can be solved through differencing. Then, it is necessary to have a technique that could the data at first difference without losing the long run information if exists. The cointegration technique of Johansen and Juselius (1990) is one the cointegration techniques that can handle the data at first difference and it will not lose any long run information if exists in the time series data. Besides, we also can get the long run estimates from this cointegration technique.

This test can be expressed in equation form as written in Eq. 3 below:

$$\Delta X_t = \mu + \phi D_t + \Pi X_{t-p} + \Gamma_{p-1}\Delta X_{t-p+1} + \cdots + \Gamma_1 \Delta X_{t-1} + \varepsilon_t, \;\; t = 1, \ldots., T$$

Where;

$\Gamma_i = (\Pi_1 + \cdots + \Pi_i - I), i = 1, \ldots, p-1$, and Γ describes cointegration vector.

EMPIRICAL RESULTS

Descriptive statistics of the data analyzed is presented in Part A of Table 1 while correlation of the variables are depicted in Part B of Table 1. The correlation shows that GDP, labor force, capital, and export openness are correlated positively with each other whereas import openness is negatively correlated with all variables of the study. Correlation coefficient between GDP and labor force is high compare to other variables correlation coefficients with GDP. The magnitude of correlation between GDP and exports is almost same with magnitude of correlation between GDP and import openness but in opposite direction.

Table 2 shows the results of unit root tests. Results of ADF and PP tests confirm that study variables are having unit root at their level and become free from unit root problem by taking the variables at first difference. This applies that we cannot apply OLS and we have to go for cointegration test.

Table 1. Descriptive Statistics and Correlation

Part A					
	logGDP	*logLF*	*logK*	*logXO*	*logMO*
Mean	23.92452	15.18399	22.05103	-0.840333	-0.961938
Median	23.81500	15.17039	22.38388	-0.802336	-0.952740
Maximum	24.80123	15.40275	23.68703	-0.383739	-0.274590
Minimum	22.95817	14.96134	20.04494	-1.482703	-1.575942
Std. Dev.	0.709808	0.142795	1.158141	0.322049	0.380059
Observations	96	96	96	96	96
Part B					
Variable	*logGDP*	*logLF*	*logK*	*logXO*	*logMO*
logGDP	1.000000				
logLF	0.971059	1.000000			
logK	0.958603	0.960059	1.000000		
logXO	0.680607	0.552207	0.648655	1.000000	
logMO	-0.674119	-0.633134	-0.548819	-0.297004	1.000000

Table 2. Unit Root test Results

Variable	t-statistics	Variable	t-statistics
logGDP	1.09	Δ*logGDP*	-5.90***
logLF	3.12	Δ*logLF*	-7.49***
logK	0.19	Δ*logK*	-5.64***
logXO	-1.49	Δ*logXO*	-5.44***
logMO	-1.13	Δ*logMO*	-5.46***

*** represents significance at 0.01 level of significance

The result of Johansen cointegration test is depicted in Table 3 below. The value of trace statistics shows two cointegration vectors and maximum eigen value statistics confirms upon a unique cointegration vector among the variables of the study.

The null hypothesis of no cointegration is rejected at 0.05 level of significance. Thus, we can conclude from these results that a long run relationship is present among study variables. Now, we can move forward to get long run estimates based on cointegration test and also can determine the ECM (error correction model) to get short run estimates for the study specified model.

Table 3. Long run Relationship Results

Rank r	Trace Statistics	0.05 Critical Value	Maximum Eigenvalue	0.05 Critical Value
$r_0 = 0$	95.85019*	76.97277	35.74476*	34.80587
$r_0 \leq 1$	60.10543*	54.07904	27.78098	28.58808
$r_0 \leq 2$	32.32444	35.19275	20.15405	22.29962
$r_0 \leq 3$	12.17039	20.26184	10.10638	15.89210
$r_0 \leq 4$	2.064010	9.164546	2.064010	9.164546

* denotes rejection of the hypothesis at the 0.05 level of significance

Table 4 shows the results of long run estimates. All the independent variables of the model of the study are having significant effect on economic growth. The effect of labor force, capital formation, and exports openness is positive whereas imports openness has negative impact on economic growth in Azerbaijan during the study period. The positive and significant effect of labor force and capital formation on economic growth is as per economic theory. The effect of exports openness and imports openness maybe positive or negative, depending on the economic structure of the economy and the composition of exports and imports in trade with rest of world.

Table 4. Long run estimates

Dependent variable: *logGDP*		
Regressors	Coefficients	t-statistic
logLF	3.14***	5.42
logK	0.13*	1.92
logXO	0.36***	4.78
logMO	-0.22***	-3.44

*** and * represents significance at 0.01 and 0.10 level respectively

The results estimates of ECM are presented in Table 5. Like long run results, labor force, capital, and exports openness are found to be significant and having positive effect on economic growth in the short run. Whereas imports openness is resulting in hurting economic growth as its coefficient is negative and significant. The error correction term turns out negative and significant that confirms the model is in equilibrium and taking less than three years to adjust itself from any disequilibrium due to external shocks.

Table 5. ECM estimates based on Johansen cointegration

Dependent variable: Δ*logGDP*		
Variable	Coefficient	t-Statistic
Constant	0.001	0.011
Δ*logLF*	2.67***	5.64
Δ*logK*	0.10***	3.06
Δ*logXO*	0.28***	7.15
Δ*logMO*	-0.16***	-4.57
ECT(-1)	-0.13***	-3.28
R^2	0.63	
F-statistic	29.85***	
Durbin-Watson stat.	1.97	

*** represents significance at 0.01 level

CONCLUSION

This study has attempted to explore the role of trade openness on the Azerbaijan's economic growth. However, in this study the trade openness is being decomposed into exports and imports openness in order to distinguish the effect of exports and imports openness on economic growth. This study identifies an empirical model for the said purpose and labor force and capital formation are used as control variables in the empirical model. Further, this study analyzes time series data for Azerbaijan's economy. However, time series properties are checked before analyzing the time series data. This study finds that all series of the study are integrated of order one. Thus, to find out long run relationship among variables this study applies cointegration test. The results of the cointegration test show that variables are in the long run relationship. Results of the study confirms that labor force, capital, and exports openness has positive and significant effect on economic growth in the long run whereas imports openness has negative effect on economic growth. Similarly, the error correction model results confirms the same scenario that exports openness along with labor and capital has positive effect on economic growth whereas imports openness has negative impact on economic growth of Azerbaijan in the short run. The error correction model also confirms that the model is in equilibrium but it will take more than seven years to adjust to equilibrium from any external shock. This study recommends that Azerbaijan has to take steps to improve the human and physical capital to promote and to sustain the economic growth of the country. The authorities have to make sure to increase the skill labor force in order to extract the fruit in form of persistent economic growth. Policies measures are required to facilitate both local and foreign

investment for the development of the country. The results of this study suggest that trade facilitation will encourage economic growth of the country however; government needs to facilitate imports of technology and intermediate goods in order to reap the fruits of trade openness. In order to not just stick and rely on oil exports the Azerbaijan government should diversify its exports basket through reforms in and investing in manufacturing sector. However, for sustainable trade openness the government has to initiate legal framework to hasten trade licensing, restructure import authorization and to harmonize trade facilitation by enhancing the services and monitoring of the trade institutions. Similarly, the authority has to ensure to reduce clearance delays at borders. Azerbaijan should blossoms regional integration with trade blocs and should negotiate new trade agreements at regional level and with rest of world as well.

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