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Does Trade Openness cause Growth?

An Empirical Investigation

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Abstract:

This dissertation investigates the casual relationship between trade openness and economic growth in a sample of 87 countries (developing & developed) during the period 1970-2013. According to the previous literature, the openness-growth relationship seems to be relatively unclear and inconclusive, although the general tendency is that openness has a positive impact on economic growth. Our empirical results confirm this ambiguous relationship and provide evidence which vary across model specification. Regarding of the per capita income regression for all countries, trade openness has a positive but not a robust impact on income, as the coefficient of openness is positive but at the same time insignificant. As far as growth regression is concerned, it seems that there is a positive relationship between openness and growth for all countries. More specific, for developing countries trade openness has a negative effect on income per capita and a positive one on income growth. On the other hand, a negative relationship between openness and income per capita and income growth presented in our results for developed countries.

Keywords: Trade openness, income per capita, economic growth

Acknowledgments

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1. Introduction

One of the most common controversial issues in economics has to do with the fact that some countries are rich while others remain poor. At the same time the pace in the growth of their economies is relatively different. The major reason of such inequalities is the different economic policies that are followed by countries. There is a wide range of policies that can be adopted, although the main aim of each economic policy should be to promote economic growth and development. But why is economic growth so important? The answer is rather simple and that lies to the fact that economic growth raises our living standards. According to Easterly (2001, p.3):

"We care because it betters the lot of the poor and reduces the proportion of people who are poor. We care because richer people can eat more and buy more medicines for their babies."

It is well known that economic growth and development can increase a country's welfare by improving the standard of living, increasing employment and tax revenues which can be used for future investments.[1] Also these can be obtained by rising the profitability of companies thus, making them bigger and more competitive in the global market.[2] There is a wide range of factors that clearly affect the economic growth; however trade openness has always been the most famous engine of economic growth. Now whether it really deserves all this credit or not is the question which we explore in this dissertation.

Whether and how trade openness influences economic growth has for long been an interesting point of research for development economists. On the one hand efficient international trade policies results in sustained economic growth, on the other hand though it is not still considered to be a sufficient condition for economic growth and development (Alfred Marshall).

Although, one cannot rely on theoretical framework because theories do not provide a decisive answer to the trade-growth relationship as mentioned by Ulasan (2012).

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[1] Berhani R. (2015) "Economic Growth and Openness in Transition: A Study of Western Balkans" *Academic Journal of Interdisciplinary Studies Vol: 4* No: 1, 2015 p. 423-434.

[2] Berhani R. (2015) "Economic Growth and Openness in Transition: A Study of Western Balkans" *Academic Journal of Interdisciplinary Studies Vol: 4* No: 1, 2015 p. 423-434.

Through the years researchers have been forced to use a variety of econometric tools in order to define the exact relationship between trade openness and economic growth. What is proven is that there is indeed a positive relationship between the two concepts. There are some issues however concerning the accuracy of the extent in which trade openness and economic growth are related. Despite the fact that their relationship is somehow fragile, there is not significant evidence that international trade is harmful for economic growth (Fiestas 2005).

The main objective of this dissertation is to analyze how trade openness can have an enormous impact on economic growth among a sample of countries, during the period 1970-2013. First, we examined how openness affects income per capita. The results provided us with evidence that there is a likely positive relationship between openness and income per capita in all countries. Continuing with openness and its influence on economic growth for the whole sample of countries, it seems that whenever openness increases, economic growth increases at the same time.

Becoming more specific and detailed, we separated the sample of countries into developing and developed in order to analyze how trade openness affects income per capita and growth into different regions. Our findings seem to confirm the common findings meaning that openness has a positive impact on economic growth in developing countries and a negative in developed ones.

The dissertation consists of four parts. The first part provides the theoretical and empirical framework relating with the topic. The second part analyzes the data and the variables that have been used in the models. The third part specifies the econometric models that will be used in the regressions and finally the fourth part contains the interpretation of the results.

2. Literature Review

The relationship between trade openness and economic growth has been an issue queried in the theoretical and empirical growth literature for a long time. First, Adam Smith (1937) and David Ricardo (1973) have confirmed the positive relationship between trade openness and growth. According to Smith and Ricardian model, openness increase income per capita when countries specialize in that good that they have comparative labor-productivity advantage.[3] Also, openness can indirectly lead to development via different channels like: technology transfer, product diversity, increasing scale economies, efficient allocation and distribution of resources.[4]

Later, Heckscher and Ohlin (1938) based on the Ricardian model, developed a two-factor model (capital and labor) which promotes that countries will export goods that use their abundant factor intensively and import products that use their scarce factor. Therefore, as the degree of openness increases, it will be observed that the resources in an economy shift to the sectors that draw upon the abundant factor.[5] Hence, an increase in production will be observed (Lopez, 2005:625).[6]

As, theoretical literature does not provide any clear picture on openness and growth relationship, we make an attempt to approach a better understanding of this relationship through the empirical review. In that way it will be possible to determine the potential relationship and direction of causality, if any, as well between trade openness and economic growth.

Dollar (1992) and Edward (1998) found that more open economies have higher possibilities of growing faster than closed economies. More specific, Dollar (1992) supported that the most developing countries promote an open economy for growth perspective. Edward (1998) used 93 countries to analyze the relationship between openness and total factor productivity growth. While, trade openness increase imports

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[3] Pigka- Balanika V. (2013) *"The impact of trade openness on economic growth Evidence in Developing Countries"* Erasmus School of Economics, p. 1-32.
[4] Pigka-Balanika V. (2013) "The impact of trade openness on economic growth Evidence in Developing Countries" Erasmus School of Economics, p. 1-32.
[5] Zeren F. & Ari A. (2013) "Trade Openness and Economic Growth: A Panel Causality Test", *International Journal of Business and Social Science*, Page: 300-318.
[6] Zeren F. & Ari A. (2013) *"Trade Openness and Economic Growth:* A Panel Causality Test", *International Journal of Business and Social Science*, Page: 300-318.

and exports of goods and services, domestic technology is developed.[7] As a result, open economies grow faster than closed ones.[8]

Harrison (1996) studied the correlation between openness and economic growth, according to different time periods. The results vary depending on the choice of the study period. Nevertheless, she concluded that there is a positive impact of openness on economic growth.

Frankel and Romer (1999) examined the relationship between trade openness and income by constructing measures of geographic component of countries in order to obtain instrumental variables estimates. According to their results, trade openness has a large, significant and robust positive effect on income. These findings suggest that the causality is running from trade openness to economic growth instead of the other way round (Willard, 2000).[9]

Bahmani and Oskoee (1999) investigated 59 countries during 1960-1992 period and they concluded that there is a positive association between openness and growth into 19 countries.[10] Ahmad and Anoruo (2000) stated that there was a two-sided causality relationship among openness and economic growth by testing 5 countries during 1960-1997, in an error correction model.[11]

Irwin and Tervio (2001) following Frankel and Romer in their attempt to overcome the endogeneity problem, they found that countries which trade more have higher incomes. As a result, they concluded that trade is measured with substantial error and that it is an imperfect proxy for other income-enhancing interactions between nations. Wacziarg (2001) argued that trade openness plays a significant positive role on economic growth by investigated 57 countries during the period 1970-1989.

Vamvakidis (2002) examined the correlation between trade openness and growth during the period 1870-1990. He found that the positive openness-growth link is

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[7] Pigka-Balanika V. (2013) "The impact of trade openness on economic growth Evidence in Developing Countries" Erasmus School of Economics, p. 1-32.

[8] Pigka-Balanika V. (2013) "The impact of trade openness on economic growth Evidence in Developing Countries" Erasmus School of Economics, p. 1-32.

[9] Tahir M. & Ali H. O. (2014) "Trade Openness and Economic Growth: A Review of the Literature" *Canadian Center of Science and Education, Asian Social Science; Vol. 10*, No. 9; 2014, p. 100-138.

[10] Mercan M. Göçer I. Sahin B. & Dam M. (2012) "The Effect of Openness on Economic Growth: Panel Data Analysis" *3rd International Symposium on Sustainable Development*, p. 100-163.

[11] Mercan M., Göçer I. Sahin B. & Dam M. (2012) "The Effect of Openness on Economic Growth: Panel Data Analysis" *3rd International Symposium on Sustainable Development*, p. 100-163.

rather a recent phenomenon, mostly driven by the unprecedented expansion in world trade, which began in the 1970s.[12]While no significant positive relationship was found for periods before 1970, the period 1970-1990 showed a significant positive effect of trade openness on economic growth.[13]

Furthermore, Krueger and Berg (2003) provided a cross country investigation of trade-growth relationship and they finally stated that trade has a great significant influence on economic growth. Brunner (2003) studied the effect of trade openness on the level of income and income growth and he found that openness has significant impact on the income level and not on income growth.

Yanikkaya (2003) summarized earlier studies on trade and growth theory and according to him there is a negative association with trade barriers and growth. He provided evidence proving that restrictions on trade can promote growth, especially in developing countries under certain conditions. He also supported that the relationship among trade restrictions and growth depends on whether it is a developed or a developing country, whether it is big or small and whether a country has a comparative advantage in those sectors that are protected. Finally, Yanikkaya concluded that countries with higher trade shares grow faster than other countries.

Dollar and Kraay (2004), using a large panel sample of countries and an openness indicator that based on trade volumes, they found that opening the economy to international trade can bring about significant growth improvements.[14] Lee (2004) investigated the relationship between trade openness and economic growth based on a sample of 100 countries during the period 1961-2000 and he concluded that openness has a positive robust effect on growth.[15] Also, Alcala and Ciccone (2004) used real

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[12] Sakyi D., Villaverde J. & Maza A. and Chittedi K. (2012) "Trade Openness, Growth and Development: Evidence from Heterogeneous Panel Cointegration Analysis for Middle-Income Countries" *Cuadernos de Economía 3Vol 1(57)* No. Especial, 2012, p.21-38.

[13] Sakyi D., Villaverde J. & Maza A. and Chittedi K. (2012) "Trade Openness, Growth and Development: Evidence from Heterogeneous Panel Cointegration Analysis for Middle-Income Countries" *Cuadernos de Economía 3Vol 1(57)* No. Especial, 2012, p.21-38.

[14] Olasode O. S., Raji O.A, Adedoyin A. O. & Ademola I. S. (2015) "Trade openness and economic growth" *International Journal of Economics, Commerce and Management*, p. 816-817.

[15] Sakyi D., Villaverde J. & Maza A. and Chittedi K. (2012) "Trade Openness, Growth and Development: Evidence from Heterogeneous Panel Cointegration Analysis for Middle-Income Countries" *Cuadernos de Economía 3Vol 1(57)* No. Especial, 2012, p.21-38.

openness measure to study the openness-growth relationship and they concluded that openness has a significant positive impact on economic growth.

The study by Villaverde and Maza (2011) conducted for a sample of 101 countries during the period 1970-2005 also shows that economic globalization (for which trade openness is one of the main indicators) leads to a higher economic growth and simultaneously, to worldwide income convergence.[16]

More recently, Busse and Königer (2012) argued that the effect of trade in dynamic panel estimations depends crucially on the specification of trade. But finally, they concluded that openness has a positive and highly significant impact on economic growth, especially for developing countries.

However, there are other research papers that criticize the positive relationship between trade openness and economic growth. Rodriguez and Rodrik (1999) disagreed with Edwards (1992) and Dollar and Kraay (2004) as they supported that the positive correlation of trade openness and economic growth happens due to lack of factors that researchers do not take under consideration. According to Rodriguez and Rodrik, free trade increases income but does not lead to sustained growth in the long run.

Also, Rodrik (2002) criticized Alcala and Ciccone (2002) and Dollar and Kraay (2004), because they used real openness measure which always results positive biased estimations, instead of conventional measures of openness.[17] Finally, the study of Rigobon and Rodrik (2004) concluded that trade openness proxy as (trade share in GDP) found that openness of trade has a significant negative effect on the economic growth.[18]

As mentioned earlier, the openness-growth relationship also depends on whether a country is large or small, whether it is developed or developing. Most of studies

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[16] Sakyi D., Villaverde J. & Maza A. and Chittedi K. (2012) "Trade Openness, Growth and Development: Evidence from Heterogeneous Panel Cointegration Analysis for Middle-Income Countries" *Cuadernos de Economía 3Vol 1(57)* No. Especial, 2012, p.21-38.

[17] Pigka-Balanika V. (2013) "The impact of trade openness on economic growth Evidence in Developing Countries*"* Erasmus School of Economics, p. 1-32.

[18] Ali W. & Abdullah A. (2015) "The Impact of Trade Openness on the Economic Growth of Pakistan: 1980-2010" *Global Business and Management Research: An International Journal Vol. 7,* No. 2 (2015), p. 70-122.

suggested that trade openness boost economic growth, especially in developing countries.

Sachs and Warner (1995) investigated the positive relationship between trade openness and economic growth between developing and developed countries. They found out that open developing economies have grown at a higher rate (4.49%) per year, instead of developed economies (2.29%). For closed developing and developed countries the growth percentage was 0.69 and 0.74 per year respectively.

Harrison (1996) examined the relationship between trade openness and growth only in developing countries during 1960-1987 and she stated that as openness increases, economic growth increases rapidly. Later, Spilimbergo (2000) showed that developing countries benefit more in terms of welfare gains, than developed ones.[19] Therefore trade openness connects developing countries, in particular, to more advanced countries not only to acquire foreign exchange through exports, but most importantly through the access to intermediate and high-tech goods through imports, which facilitate the diffusion of knowledge and technology (see Feder, 1982; Grossman and Helpman, 1990, 1991; Rodrik, 1999; Almeida and Fernandes, 2008). [20]

Rassekh (2007) after using the empirical model of Frankel and Romer for a sample of 150 countries to investigate the impact of trade openness on levels of income and the rate of income growth, he concluded that trade openness benefits the developing countries (low-income countries) more than the developed ones.[21]

Chang (2009) after his examination of the impact on trade openness to economic growth, among 82 countries (22 developed and 60 developing) during 1960-2000, he concluded that trade openness affects positively economic growth, especially in developing countries rather than developed ones.

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[19] Sakyi D., Villaverde J. & Maza A. and Chittedi K. (2012) "Trade Openness, Growth and Development: Evidence from Heterogeneous Panel Cointegration Analysis for Middle-Income Countries" *Cuadernos de Economía 3Vol 1(57)* No. Especial, 2012, p.21-38.

[20] Sakyi D., Villaverde J. & Maza A. and Chittedi K. (2012) "Trade Openness, Growth and Development: Evidence from Heterogeneous Panel Cointegration Analysis for Middle-Income Countries" *Cuadernos de Economía 3Vol 1(57)* No. Especial, 2012, p.21-38.

[21] Sakyi D., Villaverde J. & Maza A. and Chittedi K. (2012) "Trade Openness, Growth and Development: Evidence from Heterogeneous Panel Cointegration Analysis for Middle-Income Countries" *Cuadernos de Economía 3Vol 1(57)* No. Especial, 2012, p.21-38.

Trade openness has been considered as one of the main techniques used to help developing countries to alter both the pace, pattern, and structure of their participation in the international market scene.[22] It is true that balance-of-payments problems can sometime occur but they can be faced by trade openness.[23] In this way technical progress and promotion in economic growth can be achieved.[24] It is considered that openness to trade helps to improve economic performance by increasing competition and by giving domestic firms access to the best foreign technology, which is very helpful to raise domestic productivity, and to achieve better finance.[25]

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[22] Sakyi D., Villaverde J. & Maza A. and Chittedi K. (2012) "Trade Openness, Growth and Development: Evidence from Heterogeneous Panel Cointegration Analysis for Middle-Income Countries" *Cuadernos de Economía 3Vol 1(57)* No. Especial, 2012, p.21-38.

[23] Sakyi D., Villaverde J. & Maza A. and Chittedi K. (2012) "Trade Openness, Growth and Development: Evidence from Heterogeneous Panel Cointegration Analysis for Middle-Income Countries" *Cuadernos de Economía 3Vol 1(57)* No. Especial, 2012, p.21-38.

[24] Sakyi D., Villaverde J. & Maza A. and Chittedi K. (2012) "Trade Openness, Growth and Development: Evidence from Heterogeneous Panel Cointegration Analysis for Middle-Income Countries" *Cuadernos de Economía 3Vol 1(57)* No. Especial, 2012, p.21-38.

[25] Sakyi D., Villaverde J. & Maza A. and Chittedi K. (2012) "Trade Openness, Growth and Development: Evidence from Heterogeneous Panel Cointegration Analysis for Middle-Income Countries" *Cuadernos de Economía 3Vol 1(57)* No. Especial, 2012, p.21-38.

3. Data

The panel data set used in this study consists of 87 developing and developed countries (see Appendix A) during the period 1970-2013. Data are not available for all countries, especially when we refer to the early 70's periods. The data are: GDP per capita (constant 2005 US $), GDP (constant 2005 US $), exports of goods and services (constant 2005 US $), imports of goods and services (constant 2005 US$), gross capital formation (constant 2005 US $), population (total), school enrollment, tertiary (% gross), government effectiveness: estimate, rule of law: estimate and openness which is defined as the volume of exports and imports divided by GDP. Variables have been transformed in natural logarithms.

All the data are taken from World Development Indicators of the World Bank, except the government effectiveness and rule of law, which are taken from Worldwide Governance Indicators of the World Bank. Government effectiveness and rule of law applied in our model as instruments to overcome the endogeneity problem. Also, measures of investment and education (human capital) are indicated from gross capital formation and school enrollment tertiary data. While an increasing in GDP per capita defines economic growth.

Figure 1 presents the possibly relationship between GDP per capita and its covariates: openness and gross capital formation. According to figure 1, we observe that there is a clearly positive relationship among GDP per capita and gross capital formation. However, the relationship between GDP per capita and openness seems to be positive but indecisive, according to the first graph.

Figure 1: GDP per capita and it's covariates
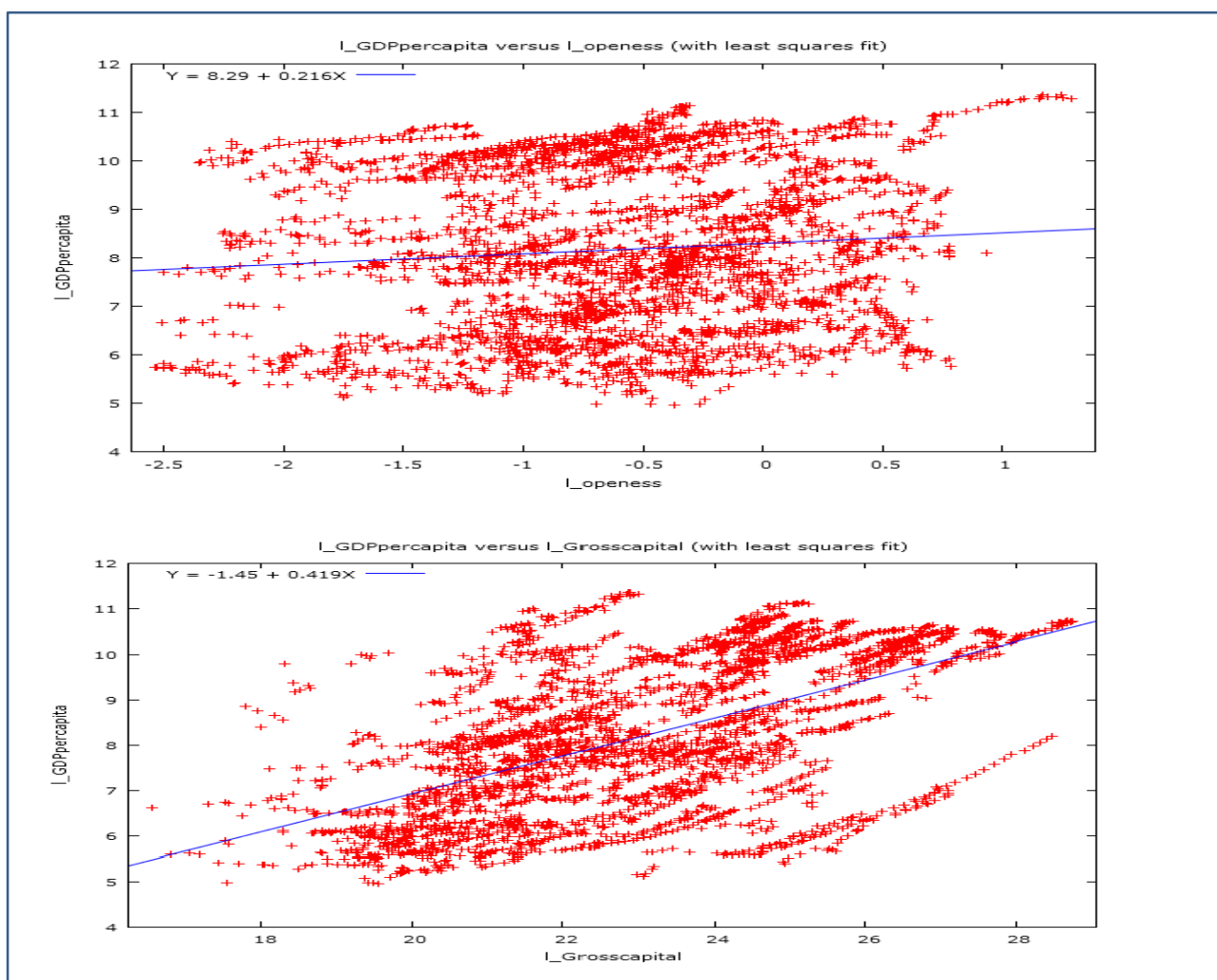
A brief discussion of the above variables:

➢ GDP per capita

"GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products."(World Bank) The variable is measured in US dollars at constant 2005 prices.

➢ Openness

Openness is defined as the sum tof exports and imports divided by GDP. "Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. Moreover, imports of goods and services represent

the value of all goods and other market services received from the rest of the world. Both of them include the value of merchandise, freight, insurance, transport, travel, royalties, and license fees and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income."(World Bank) The variable is measured in US dollars at constant 2005 prices.

➢ Gross capital formation

"Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements, machinery and equipment purchases, constructions of roads, school, offices, hospitals and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales."(World Bank) The variable is measured in US dollars at constant 2005 prices.

➢ School enrollment tertiary

"Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Tertiary education, whether or not to an advanced research qualification, normally requires, as a minimum condition of admission, the successful completion of education at the secondary level."(World Bank)

➢ Population (total)

"Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. The values shown are midyear estimates."(World Bank)

➢ Government Effectiveness: estimate

"Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the

government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5."(World Bank)

➢ Rule of law: estimate

"Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5."(World Bank)

Descriptive statistics describe main features of a data collection and give a first view of the dataset. The descriptive statistics of our variables are showed on table 3.1, including mean, median and standard deviation. According to table 3.1, investment has the higher mean, median and standard deviation, followed by education and population leaving in that way openness in the last places of the hierarchy.

Table 3.2 presents the correlation matrix among variables. GDP per capital is positive correlated with all variables except the population. Also, openness seems to be having a positive correlation with all the variables, but at the same time a negative one with investment and population.

Table 3.1: Descriptive Statistics

Variable	Mean	Median	Std. Dev.
GDPpc	8.13	7.99	1.65
Openess	-0.60	-0.57	0.68
Investment	23.0	22.92	2.25
Education	2.73	2.98	2.08
Population	16.29	16.14	1.68
Government	-0.20	0.14	1.07
Rule of law	-0.11	0.21	0.93

Table 3.2: Correlation Matrix

	GDPpc	Openness	Investment	Education	Population	Government	Rule of law
GDPpc	1	0.08	0.57	0.51	-0.15	0.73	0.82
Openess		1	-0.30	0.09	-0.55	0.02	0.08
Investment			1	0.48	0.63	0.20	0.19
Education				1	-0.03	0.26	0.54
Population					1	-0.19	-0.25
Government						1	0.79
Rule of law							1

4. Model Specification

The objective of this study is to investigate the effect of trade openness to economic growth in a sample of 87 countries, using cross-sectional data for the period 1970-2013.

Starting with the Cobb-Douglas production function which is given by:

- $Y (L, K) = AL^{\beta}K^{\alpha}$ $0<\alpha<1$, $0<\beta<1$ (1)

Where: Y is the output, L is labor, K is capital, A is a positive constant and α, β are the output elasticities of capital and labor respectively. These values are constants determined by available technology.

Starting our analysis with the level income equation, we have:

- $\ln(Y_{it}/N_{it}) = \alpha_0 + \beta_1\ln(OP_{it}) + \beta_2\ln(GCF_{it}) + \beta_3\ln(ED_{it}) + \beta_4\ln(POP_{it}) + u_{it}$ (2)

where, (Y_{it}/N_{it}) stands for GDP per capita for country i at time t, OP_{it} is openness, which defined as exports plus imports divided by GDP, GCF_{it} is gross capital formation, ED_{it} is the school enrollment (tertiary) and POP_{it} is the total population.

Equation 2 cannot be estimated consistently by using ordinary least square method (OLS) due to the endogeneity problem between GDP per capita and openness. As a result, OLS regression produces biased and inconsistent estimates, different from the reality.

So, we will estimate our model with different techniques, but first we should choose which technique is the most suitable for our model: fixed effect or random effect estimation. "The rationale behind random effects model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. Instead of fixed effect which estimator treats the quantities of explanatory variables as non-random." [26] According to the Hausman test[27], the best estimation for our model is fixed effect.

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[26] http://www.princeton.edu/~otorres/Panel101.pdf.

Due to endogeneity problem in the level income equation, it is necessary to find instruments which are more related to openness instead of income, in order to calculate an instrumental variable regression. Inspired by Hall and Jones (1999), we concluded to use instruments that are related to institutional quality. So, government effectiveness and rule of law were treated as instruments to overcome the endogeneity problem in our model.

While in this study we examine the relationship between trade openness and economic growth, let's continue with the growth regression. Following Caselli, Esquivel and Lefort (1996), we have:

- $\ln(y_{i,t}) - \ln(y_{i,t-\tau}) = \beta \ln(y_{i,t-\tau}) + W_{i,t-\tau}\,\delta + \eta_i + \xi_t + \varepsilon_{i,t}$ (3)

where $y_{i,t}$ is per-capita GDP in country i in period t, $W_{i,t}$ is a row vector of determinants of economic growth, η_i is a country specific effect, ξ_t is a period-specific constant, and $\varepsilon_{i,t}$ is an error term.

We have the following equation for our growth regression model:

- $\ln y_{it} - \ln y_{it-1} = \alpha + \beta_1(\ln y_{it-1}) + \beta_2(\ln OP_{it}) + \beta_3(\ln GCF_{it}) + \beta_4(\ln ED_{it}) + \beta_5(\ln POP_{it}) + \varepsilon_{it}$ (4)

or equivalently:

- $\ln y_{it} = \alpha + (\beta + 1)\ln y_{it-1} + \beta_2(\ln OP_{it}) + \beta_3(\ln GCF_{it}) + \beta_4(\ln ED_{it}) + \beta_5(\ln POP_{it}) + \varepsilon_{it}$ (5)

where y_{it} is the GDP per capita for country i at t time period, y_{it-1} is the GDP per capita for country i in t-1 time period, OP_{it} is openness, which defined as exports plus imports divided by GDP, GCF_{it} is gross capital formation, ED_{it} is the school enrollment (tertiary) and POP_{it} is the total population.

The above dynamic panel data model has some known difficulties. Estimating the particular model by ordinary least squares (OLS) method, we will lead again to biased

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[27] H = 270.557 with p-value = prob(chi-square(4) > 270.557) = **2.41968e-057**. A low p-value counts against the null hypothesis that the random effects model is consistent, in favor of the fixed effects model.

and inconsistent results, because of the endogeneity problem. In order to solve this problem we have to construct instruments that are correlated with the endogenous variable, but not with the dependent variable. While, it is difficult to find instruments, Arellano and Bover (1995), Blundell and Bond (1998) suggested the Generalized Method of Moments system. The system GMM estimator uses lagged levels and differences between two periods as instruments for current values of the endogenous variables.

5. Results

Following the model specification and the introduction of the variables, we now turn to the empirical results. Table 5.1 shows the estimation results of income per capita equation for the whole sample of countries during the period 1970-2013.

Starting with fixed effect estimation in column (1), we can observe that there is a positive correlation between income per capita and openness, as when openness increases by 1%, income per capital will be increased by 0.31%. All the other variables have the expected sign, with the coefficient of investment and education being positive and high significant, and with population being negative and high significant too.

Developing our regression model, we now re-estimate fixed effect including time dummies (column 2), which allow controlling time-specific effects that may not be controlled by other explanatory variables in the model. The coefficient of openness has rapidly decreased (-0.025) in magnitude, which indicates a negative relationship between income per capita and openness. For the other variables the results remain approximately at the same levels.

Column (3) shows the fixed effect estimation results of income per capita regression using the lag of openness at one period in order to avoid partially endogeneity problems and see how the coefficient of openness changes over time. The results have not changed a lot comparing with column (2), as the lag of openness slightly decreased, and still remaining negative and insignificant.

Solving the endogeneity problem in column (4), we applied the instrumental variable estimation for our model, using the lags of: government effectiveness and rule of law as instruments, thereby the results become now more reliable and accurate. So, according to the results, the coefficient of openness is positive but at the same time insignificant, which indicates a non-robust positive relationship of openness and income per capita. As far as the other variables are concerned, investment and education still influence positively income per capita.

Reported Sargan test results also fail to detect any problems in the validity of the instruments that have been used in our estimation, as the p-value is higher than five

percent level. At the same time, Hausman test rejects any suspicion of endogeneity problem in our model with p-value higher enough than the conventional level (5%).

Table 5.1: Results of income regression for all countries during 1970-2013

Independent Variable	(1) FE	(2) FE TD	(3) FE TD Lag	(4) IV
Dependent Variable: GDPpc				
Openness	0.314**	−0.025		0.0615
	(0.126)	(0.148)		(0.124)
Openness(t-1)			−0.078	
			(0.143)	
Investment	0.303***	0.309***	0.318***	0.973***
	(0.079)	(0.089)	(0.092)	(0.104)
Education	0.374***	0.145*	0.146*	0.212
	(0.074)	(0.083)	(0.084)	(0.290)
Population	−1.284***	−2.210***	−2.307***	−0.955***
	(0.243)	(0.352)	(0.370)	(0.112)
Observations	2543	2543	2513	250
Number of Countries	87	87	87	87
Specification Tests (p-values):				
Hausman Test				0.815
Sargan Test				0.157

Notes: * significant at 10% level, ** significant at 5% level, ***significant at 1% level; standard errors reported in parentheses.

Repeating the same exercise but now for the growth regression model, table 5.2 appears the growth estimation results for all countries during the period 1970-2013.

According to the results, the p-value of the Arellano-Bond test for second-order correlation in differences (Ar(2) test) rejects first-order serial correlation in all levels. However, as far as Sargan test is concerned, the instruments in our model are not valid for any estimation.

Column (1) shows the results of the dynamic panel model with the coefficient of openness being negative and significant, which indicates a negative association of openness and economic growth. Including time dummies (column 2) did not affect significant the results as the coefficient of openness decreased slightly. Column (3)

shows the results of dynamic panel model with the lag of openness be higher but not far from the coefficient of openness in column 2.

Although due to the endogeneity problem the most accurate results are shown on column (4). In the system GMM regression all the potentially explanatory variables lagged by two periods and more have been included as instruments. While the number of instruments is quite large, the model can be over fitted and weaken the power of the Sargan test. Regarding of the results in column 4, the most common view that openness play significant positive role on economic growth seems to be confirmed. In this particular specification, when openness increases by one percent economic growth will be increased by 0.143%. Also, coefficients of investment and education are positively high significant correlated with economic growth.

Table 5.2: Results of growth regression for all countries during 1970-2013

Dependent Variable: GDPpc				
Independent Variable	**(1)** **DPM**	**(2)** **DPM TD**	**(3)** **DPM TD Lag**	**(4)** **DPM -- GMM**
Openness	−0.129* (0.071)	−0.180** (0.072)		0.143** (0.06)
Openness(t-1)			−0.089 (0.086)	
Investment	0.179*** (0.038)	0.183*** (0.043)	0.164*** (0.046)	0.112*** (0.042)
Education	−0.010 (0.059)	0.008 (0.058)	−0.003 (0.058)	0.173*** (0.042)
Population	−0.152 (0.159)	−0.155 (0.196)	−0.102 (0.191)	−0.594*** (0.175)
GDPpc(t-1)	0.612*** (0.037)	0.593*** (0.040)	0.602*** (0.038)	0.784*** (0.018)
Observations	2419	2419	2413	2116
Number of Countries	87	87	87	87
Specification Tests (p-values):				
Hausman Test				
Sargan Test	0.045	0.001	0.003	0.000
AR(2) Test, p-value	0.727	0.649	0.737	0.524

Notes: * significant at 10% level, ** significant at 5% level, ***significant at 1% level; standard errors reported in parentheses.

5.1 Developing Countries

The estimation so far is concerned for the total sample, including both developed and developing countries. The question arise how openness affects income per capita and economic growth between developing and developed countries. Following the above estimations, we will repeat the same process for developing and developed countries independently.

Table 5.3 shows the results of income regression model only for developing countries during the period 1970-2013. The fixed effect estimation (column 1) yields a relatively high coefficient of openness while for the fixed effect estimation including time dummies (column 2) the coefficient has considerably decreased in magnitude. The coefficient of the lag of openness obtained by fixed effect estimation (column 3) is slightly decreased too.

Column (4) reports the instrumental variable estimates of income per capita regression, the coefficient of openness decreased rapidly compared with fixed effect estimation (column 2), which indicates that for all the developing countries the increasing of openness will lead to decreasing of income per capita. Although, we could not interpret this negative relationship as robust, because the coefficient of openness is negative but at the same time insignificant and also our instruments of the regression are invalid according to the Sargan test. Finally, the Hausman test indicates no endogeneity problem in our model, as p-value is relatively high.

Table 5.3: Results of income regression for developing countries during 1970-2013

Independent Variable	(1) FE	(2) FE TD	(3) FE TD Lag	(4) IV
Dependent Variable: GDPpc				
Openness	0.238***	−0.002		−0.133
	(0.067)	(0.151)		(0.099)
Openness(t-1)			−0.048	
			(0.145)	
Investment	0.219***	0.063	0.052	1.019***
	(0.047)	(0.092)	(0.090)	(0.099)
Education	0.237***	0.109	0.108	−0.173
	(0.045)	(0.074)	(0.074)	(0.131)
Population	−0.975***	−2.087***	−2.203***	−0.998***
	(0.125)	(0.441)	(0.432)	(0.113)
Observations	1403	1403	1382	46
Number of Countries	53	53	53	53
Specification Tests (p-values)				
Hausman Test				0.64
Sargan Test				0.003

Notes: * significant at 10% level, ** significant at 5% level, ***significant at 1% level; standard errors reported in parentheses.

Table 5.4 shows the empirical results of the growth regression only in developing countries during 1970-2013. Dynamic panel model (column 1) indicates a negative relationship between openness and growth. However while we developed our model by including time dummies (column 2) and the lag of openness (column 3), the coefficient of openness increased constantly until becoming positive (column 4). Results in column 4 may confirm the common view that there is a casual positive relation between openness and economic growth in developing countries. Also, the p-value of the Arellano-Bond test for second-order correlation in differences (Ar(2) test) rejects first-order serial correlation, as p-value is 0.43 and according to Sargan test, the instruments of our model are valid since p-value (0.60) is very high.

Finally, investment and education have a positive and significant impact on growth for developing countries and as expected increases in population lead to negative effects on economic growth.

Table 5.4: Results of growth regression for developing countries during 1970-2013

Dependent Variable: GDPpc				
Independent Variable	**(1)** DPM	**(2)** DPM TD	**(3)** DPM TD Lag	**(4)** DPM -- GMM
Openness	−0.176**	−0.130*		0.028
	(0.071)	(0.074)		(0.048)
Openness(t-1)			−0.133	
			(0.095)	
Investment	0.128***	0.091**	0.090**	0.092***
	(0.038)	(0.037)	(0.041)	(0.023)
Education	0.069	−0.016	−0.023	0.050*
	(0.059)	(0.063)	(0.061)	(0.028)
Population	−0.521***	−0.202	−0.163	-0.293***
	(0.164)	(0.240)	(0.229)	(0.092)
GDPpc(t-1)		0.567***	0.601***	0.870***
		(0.057)	(0.055)	(0.010)
Observations	1328	1328	1323	1288
Number of Countries	53	53	53	53
Specification Tests (p-values)				
Hausman Test				
Sargan Test	0.747	0.991	0.988	0.603
AR(2) Test, p-value	0.012	0.033	0.043	0.439

Notes: * significant at 10% level, ** significant at 5% level, ***significant at 1% level; standard errors reported in parentheses.

5.2 Developed Countries

When we estimate our specified model only for the developed countries, the results of the estimates are differentiated. Table 5.5 presents the results of income per capita regression only for developed countries during the period 1970-2013. It seems that for these countries there is a negative relationship between income per capita and openness, as for all estimations with fixed effects (column 1, column 2, column 3) all

the coefficient of openness are rapidly decreased. More specific, in fixed effect estimation with time dummies (column 2) the coefficient of openness is negative and significant, which indicates the negative association of openness with income per capita in developed countries.

In column 4, openness is treated as endogenous and the lags of: government effectiveness, rule of law, investment, education and population are used as instruments to calculate the instrumental variable regression. The estimates imply that there is a negative association of openness with income per capita. Although the coefficient of openness is negative but also insignificant and our instruments according to Sargan test, are not valid which means that we should be careful with the robust interpretation of the results.

Table 5.5: Results of income regression for developed countries during 1970-2013

Dependent Variable: GDPpc				
Independent Variable	(1) FE	(2) FE TD	(3) FE TD Lag	(4) IV
Openness	−0.081 (0.094)	−0.385** (0.189)		−0.188 (0.174)
Openness(t-1)			−0.440** (0.196)	
Investment	0.620*** (0.071)	0.651*** (0.097)	0.674*** (0.100)	1.037*** (0.056)
Education	0.445*** (0.059)	0.286** (0.112)	0.292** (0.113)	−0.173 (0.141)
Population	−0.308 (0.303)	−0.947 (0.403)	−1.034** (0.421)	−1.128*** (0.065)
Observations	1140	1140	1131	143
Number of Countries	34	34	34	34
Specification Tests (p-values):				
Hausman Test				0.399
Sargan Test				1.86673e-007

Notes: * significant at 10% level, ** significant at 5% level, ***significant at 1% level; standard errors reported in parentheses.

Table 5.6 shows the results of growth regression for developed countries during 1970-2013. The estimates, in dynamic panel model (column 1), imply a negative correlation with openness and economic growth. Adding time dummies in our model (column 2), openness rises slightly but still remaining negative and insignificant. Also, the coefficient of lag of openness (column 3) seems to confirm the negative relationship between openness and growth for developed countries.

The GMM estimation (column 4) provides information that openness has a negative impact on economic growth in developed countries. The p-value of the Arellano-Bond test for second-order correlation in differences (Ar(2) test) rejects first-order serial correlation in all levels and Sargan test provide valid instruments for the instrumental variable regression.

For the other variables, investment and education affect positively economic growth in developed countries. While, if coefficient of investment and education increase by 1%, economic growth will be increased by 0.23% and 0.096 respectively. Population remains negative for all countries, even for developed countries too.

Table 5.6: Results of growth regression for developed countries during 1970-2013

	Dependent Variable: GDPpc			
Independent Variable	(1) DPM	(2) DPM TD	(3) DPM TD Lag	(4) DPM -- GMM
Openness	−0.237* (0.134)	−0.171 (0.124)		-0.005 (0.072)
Openness(t-1)			−0.228* (0.125)	
Investment	0.325*** (0.086)	0.308*** (0.087)	0.330*** (0.087)	0.230*** (0.061)
Education	−0.070 (0.093)	0.081 (0.059)	0.102 (0.062)	0.096** (0.045)
Population	−0.573 (0.415)	−0.109 (0.259)	−0.167 (0.284)	-0.046 (0.209)
GDPpc(t-1)	0.671*** (0.021)	0.610*** (0.050)	0.589*** (0.052)	0.830*** (0.018)
Observations	1091	1091	1090	1057
Number of Countries	34	34	34	34
Specification Tests (p-values)				
Hausman Test				
Sargan Test	0.078	0.024	0.049	0.271
AR(2) Test, p-value	0.581	0.853	0.967	0.064

Notes: * significant at 10% level, ** significant at 5% level, ***significant at 1% level; standard errors reported in parentheses.

Summarizing the empirical results we have that:

1. The per capita income regression for all countries during the period 1970-2013, provides a positive and insignificant coefficient of openness, which indicates a non-robust positive relationship between openness and income per capita.

2. The growth regression for all countries during the period 1970-2013, results a positive and significant coefficient of openness, which means that there is a positive association of openness and economic growth.

3. The per capita income regression for developing countries during the period 1970-2013, shows that the coefficient of openness is negative and insignificant, which indicates that there is a non-robust negative relationship between openness and income per capita.

4. The growth regression for developing countries during the period 1970-2013, provides that the coefficient of openness is positive and insignificant, which means that openness may affect positively the economic growth.

5. The per capita income regression for developed countries during the period 1970-2013, results that the coefficient of openness is negative and insignificant, which indicates a non-robust negative relationship between openness and income per capita.

6. The growth regression for developed countries during the period 1970-2013, shows that the coefficient of openness is negative and insignificant, which means that openness may affect negatively the economic growth.

6. Conclusion

From all the above mentioned it is obvious to state that the conclusion driven from this paper demonstrates the fact that trade openness does not have a simple and straightforward relationship with growth. Through examinations made using a large number of developing and developed countries over the last decades, we have realized that trade openness is positive in some specifications associated with growth. However we cannot ignore the fact that the results provide an ambiguous relationship between trade openness and economic growth.

In addition studies enable us to better determine trade openness and long run growth dynamics. It can be true that free trade increases income but this does not lead necessary to sustained growth in the long run. As far as developing countries are concerned, our results indicate a possible positive causality from openness to growth and vice versa, but at the same time suggest that openness can be painful for an economy of a developed country.

An important factor that makes it almost impossible for us to reach to safe conclusion regarding openness-growth relationship is that the results vary across model specification and formulation. In some cases, the results become more reliable and indicate that the coefficient of openness is positive but at the same time insignificant, which provide a non-robust relationship between trade openness and income growth.

Coming to a general conclusion it goes without questioning that the economic globalization leads to a higher economic growth and to worldwide income convergence as well as it can promote economic growth, especially in developing countries. Moreover, trade may increase income and economic growth in the long run as trade openness helps to increase domestic productivity and enhance finance. What we should always keep in mind though is that we should be careful when defining the exact relationship between openness and growth, since it cannot be precisely decoded.

References

Alcala F. & Ciccone A. (2002) "Trade and productivity." *National Bureau of Economic Research Summer Institute,* p. 1-50. Available on: http://www.sepg.pap.minhap.gob.es/sitios/sepg/es-ES/Presupuestos/Documentacion/Documents/DOCUMENTOS%20DE%20TRABAJO/D200201.pdf [7/11/15]

Alcala F. & Ciccone A. (2004) "Trade, Extent of the Market, and Economic Growth 1960-1996" *Departament d'Economica i Empresa, UPF; 765.*

Ali W. & Abdullah A. (2015) "The Impact of Trade Openness on the Economic Growth of Pakistan: 1980-2010" *Global Business and Management Research*: *An International Journal Vol. 7*, No. 2 (2015), p. 120-129. Available on: http://gbmr.ioksp.com/pdf/vol.%207%20no.%202/V7N2-15.pdf [20/09/15]

Almeida R. & Fernandes A.M. (2008) "Openness and Technological Innovations in Developing Countries: Evidence from Firm-Level Surveys." *Journal of Development Studies, Vol 44*, p. 701-727. Available on: http://isites.harvard.edu/fs/docs/icb.topic741392.files/Openness.pdf [9/11/15]

Anorua E. & Ahmad Y. (2000) "Openness and Economic Growth: Evidence from Selected Asean Countries" *The Indian Economic Journal*, *Vol 47*(3), p. 110-117. Available on: https://www.econbiz.de/Record/openness-and-economic-growth-evidence-from-selected-asean-countries-anoruo-emmanuel/10001487702 [25/11/15]

Arellano M. & Bond S. (1991) "Some tests of specification for panel data: Monte carlo evidence and an application to employment equations" *Review of Economic Studies, Vol 58(2)*, p. 277–297. Available on: http://people.stern.nyu.edu/wgreene/Econometrics/Arellano-Bond.pdf [20/9/15]

Arellano M. & Bover O. (1995) "Another look at the instrumental-variable estimation of error-components models." *Journal of Econometrics, Vol 68(1)*, p. 29–51. Available on: http://www.sciencedirect.com/science/article/pii/030440769401642D [20/9/15]

Babula R. & Anderson L. (2008) "The Link between Openness and Long-Run Economic Growth" *Journal of International Commerce and Economics*, p. 1-20. Available on: https://www.usitc.gov/publications/332/journals/openness_growth_link.pdf [22/9/15]

Bahmani-Oskooee & M. Niromand F. (1999) "Openness and Economic Growth: An Empirical Investigation" *Applied Economics Letters Vol 6*, p. 557-561. Available on: http://www.tandfonline.com/doi/abs/10.1080/135048599352592 [1/10/15]

Bajwa S. & Siddiqi M. (2011) "Trade Openness and Its Effects on Economic Growth in Selected South Asian Countries: A Panel Data Study" *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering Vol:5*, No:2, 2011 p. 212-217. Available on: http://waset.org/publications/5478/trade-openness-and-its-effects-on-economic-growth-in-selected-south-asian-countries-a-panel-data-study [23/9/15]

Baldwin R. E. (2008) "*The development and Testing of Heckscher- Ohlin Trade Models*." Massachusetts Institute of Technology, p.15-56.

Ben-David D. & Loewy M. (1998) "Free Trade, Growth, and Convergence." *Journal of Economic Growth, Vol 3*, p. 143-170. Available on: http://www.nber.org/papers/w6095 [8/11/15]

Ben-David D. & Loewy M. (2000) "Knowledge Dissemination, Capital Accumulation, Trade, and Endogenous Growth." *Oxford Economic Papers, Vol 52*, p. 637-650. Available on: http://www.jstor.org/stable/3488661?seq=1#page_scan_tab_contents [17/11/15]

Berhani R. (2015) "Economic Growth and Openness in Transition: A Study of Western Balkans" *Academic Journal of Interdisciplinary Studies Vol: 4* No: 1, 2015 p.423-434. Available on: http://www.mcser.org/journal/index.php/ajis/article/viewFile/5997/5768 [4/10/15]

Blundell R. & Bond S. (1998) "Initial conditions and moment restrictions in dynamic panel data models" *Journal of Econometrics Vol 87*, p. 115-143. Available on: http://www.ucl.ac.uk/~uctp39a/Blundell-Bond-1998.pdf [2/11/15]

Brunner A. D. (2003) "The Long-Run Effects of Trade on Income and Income Growth." *IMF Working Paper WP/03/37 Washington, DC: IMF Institute,* p.3-36. Available on: https://www.imf.org/external/pubs/ft/wp/2003/wp0337.pdf [2/12/15]

Busse M. & Königer J. (2012) "Trade and Economic Growth: A re-examination of the Empirical Evidence" *Hamburg Institute of International Economics* p. 1-24. Available on: http://www.hwwi.org/uploads/tx_wilpubdb/HWWI_Research_Paper-123_Trade-and-Growth.pdf [4/11/15]

Caselli F. G. Esquivel & Lefort F. (1996) "Reopening the convergence debate: a new look at cross-country growth empirics." *Journal of Economic Growth, Vol 1*, p. 4-389. Available on: http://personal.lse.ac.uk/casellif/papers/reopeni4.pdf [6/10/15]

Chang R., Kaltani L. & Loayza N.V. (2009) "Openness can be good for growth: the role of policy complementarities" *Journal of Development Economics, Vol 90*, p. 33-49. Available on: https://ideas.repec.org/a/eee/deveco/v90y2009i1p33-49.html [26/11/15]

Didiar T. & Pinat M. (2013) "How does trade cause growth?" *World Bank,* p.1-36. Available on: https://www.gtap.agecon.purdue.edu/resources/download/6158.pdf [4/11/15]

Dollar D. & A. Kraay (2001) "Trade, Growth and Poverty" *World Bank Policy Research Department Working Paper vol 38 No. 2587*, Washington DC. Available on: https://ideas.repec.org/a/ecj/econjl/v114y2004i493pf22-f49.html [7/11/15]

Dollar D. & Kraay A. (2004) "Institutions, trade and growth." *Journal of Monetary Economics Vol 50,* p. 133–62. Available on: https://ideas.repec.org/a/eee/moneco/v50y2003i1p133-162.html [5/11/15]

Dollar, D. (1992) "Outward-oriented developing economies really do grow more rapidly: evidence from 95 LDCs, 1976-1985" *Economic Development and Cultural*

Change,   Vol.   40   (3),   p.   523-544.   Available   on:
http://www.jstor.org/stable/1154574?seq=1#page_scan_tab_contents [14/11/15]

Dowrick S. & Golley J. (2004) "Trade Openness and Growth: Who Benefits?" *Oxford Review of Economic Policy, Vol 20*, p. 38-56. Available on: http://www.jstor.org/stable/23606672?seq=1#page_scan_tab_contents [22/11/15]

Easterly W & Levine R. (2001) "What have we learned from a decade of empirical research on growth? It's Not Factor Accumulation: Stylized Facts and Growth Models" *World Bank Economic Review, Vol 15(2),* p. 177-219. Available on: http://elibrary.worldbank.org/doi/abs/10.1093/wber/15.2.177 [3/11/15]

Edwards S. (1992) "Trade orientation, distortions and growth in developing countries." *Journal of Development Economics Vol 39*, p. 31– 57. Available on: http://www.sciencedirect.com/science/article/pii/030438789290056F [15/11/15]

Edwards S. (1998) "Openness, Productivity and Growth: What Do We Really Know?" *The Economic Journal, Vol 108,* p. 383-398. Available on: http://www.jstor.org/stable/2565567?seq=1#page_scan_tab_contents [15/11/15]

Feder G. (1982) "On Exports and Economic Growth." *Journal of Development Economics, Vol 12*, p. 59-73.

Fiestas I. (2005) "The effects of trade liberalization on growth, poverty and inequality." *CILAE Nota técnica NT/04/05*. Available on: http://www.cilae.org/publicaciones/NT0405.pdf [12/11/15]

Frankel A. J. & Romer D. (1999) "Does Trade Cause Growth?" *The American Economic Review, Vol 89(3*), p. 379-399.

Grossman G. M. & Helpman E. (1990) "Comparative Advantage and Long-run Growth." *American Economic Review, Vol 80,* p. 796-815.

Grossman G. M. & Helpman E. (1991) "*Innovations and Growth in the Global Economy.*" Cambridge, MA: MIT Press.

Gujarati D. (2011) "*Econometrics by Example*" Palgrave Macmillan.

Harrison A. E. (1996) "Openness and Growth: A Time Series, Cross Country Analysis for Developing Countries." *Journal of Development Economics Vol 48*, p. 419-447. Available on: https://ideas.repec.org/a/eee/deveco/v48y1996i2p419-447.html [2/11/15]

Huchet-Bourdon M. Mouel L. C. & Vijil M. (2011) "The Relationship between Trade Openness and Economic Growth: Some New Insights on the Openness Measurement Issue." *XIIIeme Congres de I'Association Europeenne des Economistes Agricoles (EAAE),* p. 1-17. Available on: https://ideas.repec.org/p/hal/journl/hal-00729399.html [12/11/15]

Irwin D. & Tervio M. (2001) "Does Trade Raise Income? Evidence from the Twentieth Century" *Journal of International Economics, Vol 58(1),* p. 1-18. Available on: http://www.dartmouth.edu/~dirwin/docs/jie-tervio.pdf [2/10/15]

Kali R. Mendez F. & Reyes J. (2007) "Trade Structure and Economic Growth." *The Journal of International Trade & Economic Development, Vol 16*, p. 245-269.

Krueger A. & Berg A. (2003) "Trade, Growth and Poverty: A Selective Survey." *IMF Working Paper No. 03/30* p.1-41. Available on: https://www.imf.org/external/pubs/ft/wp/2003/wp0330.pdf [16/11/15]

Lee H. Y. Ricci L. A. & Rigobon R. (2004) "Once Again, is Openness Good for Growth?" *Journal of Development Economics, Vol 75*, p. 451-472.

Lopez A. (2005) "Trade and Growth: Reconciling the Macroeconomic and Microeconomic Evidence." *Journal of Economic Surveys, Vol 19(4)*, p. 623-648.

Marshall A. (1959) "*Principles of Economics."* 8th Edition, Macmillan for the Royal Economic Society.

Mercan M., Göçer I. Sahin B. & Dam M. (2012) "The Effect of Openness on Economic Growth: Panel Data Analysis" *3rd International Symposium on Sustainable Development*, p. 100-163. Available on: http://eprints.ibu.edu.ba/1322/ [28/11/15]

Olasode O. S., Raji O.A, Adedoyin A. O. & Ademola I. S. (2015) "Trade openness and economic growth" *International Journal of Economics, Commerce and*

Management, p. 816-817. Available on: http://ijecm.co.uk/wp-content/uploads/2015/05/3549.pdf [11/10/15]

Pigka-Balanika V. (2013) "The impact of trade openness on economic growth Evidence in Developing Countries" *Erasmus School of Economics*, p. 1-32.

Rassekh F. (2007) "Is International Trade More Beneficial to Lower Income Economies?" *An Empirical Inquiry Review of Development Economics, Vol 11*, p. 159-169.

Ricardo D. 1973 "*The principles of political economy and taxation.*" London: J.M. Dent and Sons.

Rigobon R. & Rodrik D. (2004) "Rule of Law, Democracy, Openness, and Income: Estimating the Interrelationships." *NBER Working Papers, Vol 13(3)*, p. 533–564.

Robert E. Hall & Charles I. Jones (1999) "Why Do Some Countries Produce So Much More Output per Worker than Others?*" Quarterly Journal of Economics,* p. 83-116. Available on: http://web.stanford.edu/~chadj/pon400.pdf [30/9/15]

Rodriguez F. & Rodrik D. (1999) "Trade policy and economic growth: a skeptic's guide to the cross-national evidence." *NBER Working Paper 7081, Cambridge MA: National Bureau of Economic Research*, p. 261-338.

Rodríguez, F. (2007) "Openness and Growth: What Have We Learned?" *DESA Working Paper No. 51.* Available on: http://www.un.org/en/development/desa/policy/wess/wess_bg_papers/bp_wess2006_rodriguez_openness_growth.pdf [4/11/15]

Rodrik D. (1999) "*The New Global Economy and Developing Countries: Making Openness Work.*" Policy Essay No. 24. Washington, D.C.: Overseas Development Council.

Rodrik, D. Subramanian A. & Trebbi F. (2002) "Institutions rule: the primacy of institutions over geography and integration in economic development." *International*

Monetary Fund Working Paper WP/02/189, p. 4-45. Available on: https://www.imf.org/external/pubs/ft/wp/2002/wp02189.pdf [8/11/15]

Sach D. J. & Warner A. (1995) "Economic Reforms and the Process of Global Integration." *Brooking Papers on Economic Activity; 1995;1; ABI/ INFORM GLOBAL,* p. 1-118. Available on: http://www.earth.columbia.edu/sitefiles/file/about/director/pubs/brookings_q195.pdf [9/11/15]

Sakyi D., Villaverde J., Maza A. & Chittedi K. (2012) "Trade Openness, Growth and Development: Evidence from Heterogeneous Panel Cointegration Analysis for Middle-Income Countries" *Cuadernos de Economía Vol 31(57)* No. Especial 2012, p.21-38. Available on: https://ideas.repec.org/a/col/000093/010241.html [23/11/15]

Shamsadini, S., Moghaddasi, R. & Kheirandish M. (2010) "Relationship between Trade Openness and GDP Growth a Panel Data Approach." *World Applied Sciences Journal, Vol 8(7),* p. 906-911.

Spilimbergo A. (2000) "Growth and Trade: The North Can Lose." *Journal of Economic Growth, Vol 5*, p. 131-146.

Tahir M. & Ali H. O. (2014) "Trade Openness and Economic Growth: A Review of the Literature" *Canadian Center of Science and Education, Asian Social Science; Vol. 10,* No. 9 2014, p. 100-138. Available on: http://www.ccsenet.org/journal/index.php/ass/article/view/36581 [5/12/15]

Tahir, M. Norulazidah D. H. & Omar Ali P. H. (2013) "The Relationship between Trade and Income: The Case of Developed Countries." *International Research Journal of Finance and Economics, (111)*, p. 138-145. Available on: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2548102 [12/11/15]

Ulaşan, B. (2012) "Openness to International Trade and Economic Growth: A Cross-Country Empirical Investigation." *Economics*, p. 2-58.

Vamvakidis A. (2002) "How Robust is the Growth-Openness Connection? Historical Evidence." *Journal of Economic Growth, Vol 7*, p. 57-80.

Villaverde J. & Maza A. (2011) "Globalisation, Growth and Convergence." *The World Economy, Vol 34(6)*, p. 952-971.

Wacziarg, R., & Welch, H. K. (2003) "Trade Liberalization and Economic Growth: New Evidence." *NBER Working Paper No. 10152, Vol 22(2),* p. 187-231.

Wacziarg R. (2001) "Measuring the dynamics gains from trade" *The World Bank Economic Review Vol 15* p. 393-429.

Willard L. (2000) "Does Openness Promote Growth?*" Agenda, Vol 7(3)*, p. 251-261. Available on: http://press.anu.edu.au/wp-content/uploads/2011/06/7-3-A-5.pdf [7/11/15]

Yanikkaya Halit (2003) "Trade Openness and Economic Growth: a cross country empirical investigation" *Journal of Development Economics Vol 72*, p. 57-89. Available on: http://down.cenet.org.cn/upfile/37/2005723214939179.pdf [11/11/15]

Young A. (1991) "Learning by doing and the dynamic effects of international trade" *Quarterly Journal of Economics, Vol 106*, p. 369–405.

Zeren F. & Ari A. (2013) "Trade Openness and Economic Growth: A Panel Causality Test" *International Journal of Business and Social Scienc*e, p. 300-318. Available on: http://ijbssnet.com/journals/Vol_4_No_9_August_2013/32.pdf [8/10/15]

Webpages:

World Bank

Data: http://data.worldbank.org/data-catalog/world-development-indicators/ [25/9/15]

Data:http://data.worldbank.org/data-catalog/worldwide-governance-indicators

[26/9/15]

International Monetary Fund

Developing and Developed Countries:

http://www.imf.org/external/pubs/ft/weo/2015/01/weodata/groups.htm [13/11/15]

Princeton University

Panel Data Analysis: http://www.princeton.edu/~otorres/Panel101.pdf [14/10/15]

Appendix

Appendix A: Country Sample

Algeria, **Argentina**, Australia, Austria, **Bangladesh**, Belgium, **Benin**, **Bolivia**, **Brazil, Burkina Faso, Cambodia, Cameroon**, Canada, **Chile, China, Colombia, Congo: Dem. Rep., Congo: Rep., Costa Rica, Croatia, Cuba**, Cyprus, **Czech Republic**, Denmark, **Dominican Republic, Ecuador, Egypt: Arab Rep., El Salvador**, Estonia, Finland, France, **Gabon**, Germany, Greece, **Guatemala, Honduras**, Hungary, Iceland, **India, Indonesia, Iran: Islamic Rep**., Ireland, Italy, Japan, **Kenya, Korea, Rep**., Latvia, **Lebanon, Lesotho**, Luxembourg, **Macedonia: FYR, Madagascar, Malaysia, Mali,** Malta**, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia**, Netherlands, New Zealand, **Nicaragua**, Norway, **Pakistan, Panama, Peru, Philippines**, Portugal, **Puerto Rico, Rwanda, Serbia, South Asia**, Spain, **Sudan**, Sweden, **Tanzania, Thailand, Togo, Uganda, Ukraine**, United Kingdom, United States, **Uruguay, Zimbabwe**

Note: Countries in bold are developing countries. Countries are separated according to IMF among developing and developed.