

# Trade liberalization, openness and economic growth: A panel time series analysis for the global economy\*

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## Abstract

As countries join international economic system through trade, it is expected to be beneficial to developments of economies all over the world. Accordingly, the conventional opinions assert that the globalization process accelerates the economic development of countries as they liberalize their external trades and integrate their markets to global market. Yet, there have been important objections to this argument coming from theory and empirical analyses. Therefore, it becomes important to evaluate the relation between trade openness and GDP per capita. This paper analyzes the relationship between GDP per capita and trade openness for 83 countries exposed to the globalization process by imposing panel time series methods for the 1960–2018 period. The main conclusion of the paper is that the globalization experience for the developing countries is not as beneficial as for the developed countries. The positive effect of trade openness on economic growth for the developing countries weakens seriously when they aggressively impose trade liberalization policies. Furthermore, this relation disappears for the less developed countries during the liberal times.

*Key words:* Globalization, trade liberalization, trade openness, development, panel cointegration.

## 1. Introduction

Globalization is known as the process that brings countries closer in many respects. It is obvious that the driving force of globalization has been mostly related

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\* Submitted/Geliş: 16.10.2020, Accepted/Kabul: 14.06.2021

to close economic relations among countries. The integration of economies in general and an increasing international trade volume have specifically supportive effect on transforming the sphere so that the importance of global economic structure increases over time. As more countries join international economic system through trade, it is expected to be beneficial to developments of economies all over the world. Increasing trade will generate more exchanges of goods and services, skills and knowledge among countries. In this way, trade is said to have substantial positive effect on a country's economic development. Siddiqui (2015) argues that there has been a common view suggesting the more globalized world, i.e. the increased degree of economic integration of the countries, will generate an economic framework creating better circumstances for economic growth and wealth for developing countries. In other words, Pugel (2007) points out that developing countries will have the chances of increasing their exports and thus they will be able to raise their income and wealth, as their openness to external trade increase by the help of more liberalized trade policies.

Free trade policies seem to be better than protectionist policies. By free trade, it is meant that countries prefer to open their economies to international trade. The appropriate movement in favor of free trade argument has been trade liberalization. Basically, trade liberalization policy includes removing the restrictions on external trade. In other words, through trade liberalization, barriers to the movements of goods and services would be reduced; it implies removing or lessening tariff and nontariff barriers. In economics literature, there has been an extensive debate about the impact of free trade on economic development. Starting from the argument of comparative advantage, it is believed that free trade improves the efficiency of allocation of resources, it promotes the diffusion of technology and it accelerates competition in all markets.

In addition, Gnanon (2017) tells that endogenous growth models indicate the favorable effect of the openness on the long -run economic growth through increasing returns to scale generated and knowledge accumulation promoted by trade liberalization. On the other hand, trade liberalization policy deprives governments from their tariff revenues. This would create some budgetary problems in developing countries since tariff revenue has the important part of government revenue in these countries. Besides, if import restrictions for agricultural products are removed too fast, it may cause substantial unemployment and social and economic instability (Yasmin et al., 2006). Last but not the least, Chang et al. (2009) points out that free trade policy within the framework of market imperfections may generate inadequate and underproductive use of human and capital resources and it may cause shifting away from the specialization in technologically advanced sectors and sectors of featuring increasing to scale. Thus,

liberalization policies have been a controversial issue in international economics especially when it comes to the transformation of developing economies.

Supporters of “free trade” argument claim that a trade liberalization policy leads an escalation in a country’s external trade; hence it leads to economic growth and a higher degree of economic development. Trade liberalization has beneficial results for developing countries. Therefore, they should accept whatever offered by developed countries. The proponents of this approach advocate “free trade” theoretically based on Heckscher–Ohlin–Samuelson (H-O-S) model. The model is about the comparative advantage and its assumptions are not realistic according to Chang (2008). Gilpin (2001) explains the weaknesses of the model by expressing the omission of the concept of human capital in the original model, the rise of intra-industry trades between countries, huge intra-firms transfers coming out from the integration of international trade and foreign investment, the shift from comparative to competitive advantage at the international trade perspective. Governments can have a long-run view and they can pave the way for the environment that is favorable for the sectors having potentials to be competitive in global markets. Gilpin (2001) finalizes this argument saying “*Comparative or competitive advantage results from deliberate corporate decisions and government policy choices rather than appearing as a gift from Mother Nature. If international competitiveness is indeed increasingly based on technological developments, learning by doing, and economies of scale, then individual firms are ultimately responsible for creating or failing to create competitive advantage, but governments can and do have an important and even decisive role in promoting their own national firms in international markets.*”

## 2. Literature review on trade liberalization and economic development

Hastily liberalization policies in developing countries does not seem to be very beneficial. Instead, particular conditions of developing countries should be considered when trade liberalization policy is planned to be impose. According to Prebisch (1950), the benefits derived from technological improvements did not symmetrically allocate among countries and the terms of trade for the less developed producers were undermined by the open trade policies. Furthermore, inadequate level of skills in the industrial sector and negative international trade market conditions call for industrialization policy and import substitution model. Accordingly, developing countries are supposed to establish their industrial infrastructures by adopting the attitude of government interference in domestic economy and protective industrial policies.

It is noted that developing countries suffer the inadequate infrastructure and scant external markets for their manufactured outputs at their initial levels of industrialization process. Therefore, industrialization and import substitution policies seem to be essential for economic growth even if they involve some further costs. Therefore, embracing protective policies for domestic industrial sectors becomes rather important for developing countries. Export and export revenue are still important; developing countries would be able to take the advantage of industrialization through the improvements of their industrial exports. (Prebisch, 1984; 181) Prebisch supports import restrictions and domestic production of foreign goods to decrease the level of import and to develop domestic manufacturing sectors. Neoliberal trade reforms are expected to increase foreign investment needed for manufacturing industry and to enlarge capital accumulation and to improve balance of payment in a developing country; but the historical cases indicate that these were not realized for the most of developing countries. The experiences suggest that rent seeking activities come forward if investors perceive the lower margins of profit in manufacturing sector (Siddiqui, 2015; 239).

According to the trade liberalization theory, for developing countries to increase income of their people, they are supposed to integrate their markets to global markets by adopting free trade policies. The theoretical approach of comparative advantage provides the necessary assumptions supporting this view and these are mainly embraced by the classical and neoclassical economists. World Trade Organization claims that all countries would be able to take the advantages of free international trade since welfare would be enhanced through the augmented general output and consumption (WTO, 2013). Yet, the controversial part of the story is the hardship for defining the appropriate strategic policies that industrialize developing countries and make them the exporters of high value-added outputs; there is not satisfactory and complete explanation for this issue. The experiences of developing countries have given the counter evidences against the arguments of the comparative advantage theory (Siddiqui, 2015; 241). As a supporting argument, Maddison (1991) proclaims that there is no universal proposal for trading and economic development. Every single country has own particular economic conditions that are supposed to be taken into account when setting up trading and industrial policies. Moreover, the industrialization experiences of developed countries display that each of them succeeded in their adventure of industrialization through protective policies for their domestic industrial sectors. Bairoch (1993) states that free trade is an exception and protectionism is the rule from the point of historical view.

Developing countries have been advised that they should pursue trade liberalization policies and they are suggested to adopt the model of export-led growth as a development scheme. However, there are not strong and clear empirical

evidences supporting this view. During the past decades, the export-led growth model has been popular as a development plan among the developing countries. This approach should be reconsidered on the grounds that most of the countries may not have the potentials and capabilities of creating the appropriate export structure or the expected technological standards for the global trade. The current liberalization policies imposed by the developing countries may harm their economic development phase and/or their national economic sovereignty might be weakened (Siddiqui, 2015; 229).

Neoliberal economists assert that there is an important correlation between trade liberalization and economic growth. Di Maio (2008) and Rodrik (2004) argue that there is inadequate empirical evidence supporting this view and even within the empirical studies is there a number of methodical problems. Furthermore, Stiglitz (2005) notes that the reform policies on the way of “free trade” did not warrant neither growth nor stability. Neoliberal reforms on trade are expected to cause an acceleration in economic growth and were expected to bring a rapid increase in economic growth and there would be specifically an advance in exports of the manufacturing production. However, as Siddiqui (2015) points out, the average economic performances of the developing countries in terms of income growth during the trade reform period of 1980s and so on were worse than in the previous period of 1950-1980.

Chang (2007) argues that industrialized countries used some nationalistic policies such as R&D expenditures, state-owned initiatives, governmental interference to banking credits, capital controls. When they impose neo-liberal policies, their growth rate decreased. While the average growth rate of income per capita is 3.2% during the period of 1960-1980, the same rate is 2.2% for the period of 1980-1989 (Chang, 2002). Even though the neoliberal economists label the 1960's and 1970's as “bad old days” since developing countries adopt “wrong” policies such as government intervention and protective policies, those years were not as bad as they thought according to Chang (2007).

Comparing the tables that contain the related data in the study of Chang (2002) provides significant numbers that prove this. The average growth rate of income per capita in developing countries during the “old bad days” of 1960-1980 and “good days” of 1980-1999 are respectively 3% and 1.5%. The decrease in the growth rate of the group of Latin America and Caribbean countries is more dramatic; it went down from 3.1% to 0.6%. The numbers in the group of Middle East and North Africa show that there is a downturn in economic performance from 2.5% to -0.2%. Sub-Saharan Africa experienced the similar fall in growth; it is 2% in 1960-1980 and -0.7% in 1980-1999. Siddiqui (2015) claims that developing countries had much more freedom on their external trade policies during the postcolonial period of 1950-1975. These figures indicate that before the imposition of trade

liberalization policies developing countries produce better economic performances than the ones after opening their economies to international market.

According to the model of free trade policy, opening national economy to global trade develops people's living conditions in a developing country. However, Lee and Cole (1994) and Shafaeddin (2005) argue that most of the developing countries pursuing to reduce import restrictions encountered a vast of cheaper imports and they could not experience an increase in capability of producing high value-added product. Accordingly, Rodrik (2011) proclaims that building up a base for high-value added production and expanding the scales of production require an efficient state support and favorable global environment. In this manner, developing countries would be able to improve their industrial sectors and there would be an increase in the efficiency of the manufacturing production process.

Trade liberalization generates export-led development and it causes an increase in competition. Embracing export-oriented development schemes by countries leads a fairly liberal and thus efficient international trade framework (Krueger, 1980; Balassa, 1980). The theory of "free trade" has been so much popular among the economic theorists and policymakers starting from the 1980s. Being among these, Krueger (1980) and Bhagwati (2005) point out that import-substitution policies along with the industrialization strategy imposed by governments could give some undesired results with losses like rent seeking behaviors within the supported sectors. Once the rent seeking attitude become prevalent in an economy, the allocation of resources would be inefficient so as to they are directed to unproductive activities. Proponents of the "free trade" claim that developing countries should open their economies to international trade as fast as possible. In this case, they would encounter international competition which forces them to pursue productive activities to survive. However, Stiglitz (2005) claims that rent seeking behavior is not only a governmental issue, private sector involves the same problem to the large extent. Moreover, as Chang (2007) suggests, if developing countries expose their industrial sectors to global competition too early, these sectors will not find to opportunity to survive. It is necessary to give time to the sectors for developing their competing abilities since endowing economies with the skills in high technologies and establishing efficient organizational network will take time. This is known as the infant industry view and it is now obvious that even rich countries industrialized their economies through the applications of the principle of this view in their early phases of economic developments.

Siddiqui (2015) poses the question whether free-trade policies in developing countries pave the way for technological progress and increase level of productivity in industrial sector. Except the East Asian countries, most of the developing countries could not manage to upgrade their manufacturing industries and to

implement technological transformation in these sectors. They could not compete with the rivals in quality or cost of production. Path dependence and economies of scale imply early producers have the advantage of experience and capital accumulation that give them superiority of market power. They are not only better on producing with the least cost and higher quality; they have also bigger bargaining power. According to Ruttan (1998), trade and industrialization strategy of a country should be considered in the context of three factors: developmental stage of the country, its available industrial structure and the level of intellectual know-how. An increase in export of a country may not imply the growth of the capacity to product; it may only indicate an increase in the ability to export without effecting on industrialization and general economic performance.

When it comes to East Asian countries, there are adequate number of studies indicating that government supports and a method of sustainable performance checking on the sectors vastly helped the countries to build up their strong industries (Amsden, 2001). East Asian governmental intervention aiming industrialization have some specific ways of implementation. Firstly, they did not support all sectors, rather they select some of them, called strategic sectors, and these sectors are supported by public funds. They deliberately allocate public resources to investment in education, improving job skills, establishing infrastructure. Foreign direct investment (FDI) are motivated and organized as a raising the productive capabilities of countries. Last but not the least, the East Asian countries had the experiences of the gradual and selective trade liberalization approach (Lall, 2005).

At this point, it is important to mention strategic trade theory as an alternative to conventional theory of international trade. According to Gilpin (2001), strategic trade theory comprehends the growing realities of imperfect markets, economies of scale, research and development, learning by doing and technological spillovers. High-tech industries such as computers, semiconductors and biotechnology have the features of the economies of scale and learning by doing and thus there are imperfect competition and oligopolistic competition in these sectors. As a part of strategic trade policy, these types of sectors are considered as more important sectors than other sectors for the whole economy so that they deserve to be supported by government. These sectors create technological spillovers and positive externalities causing an increase in skill level for labor and in human capital. Strategic trade theory takes the market failures in these sectors into account. Therefore, firms in these sectors should be supported by government through imposing subsidies or import protection. From this point of view, free trade is not a preferable policy and national welfare can be increased by the help of government intervention. Gilpin (2001) adds by remarking “...government support for particular industrial sectors has frequently been very successful in creating technologies that spill over into the rest of economy. Most importantly, there is

*strong evidence that government support for broad-scale R & D produces a very high payoff for the entire economy. Certainly, governments around the world believe that providing support for high-tech industries is a highly productive investment over the long term.”*

In addition to the strategic trade policy, supporting macroeconomic policy along with trade liberalization works for promoting economic growth. East Asian countries supported the progress in the industrial sector by using government interventions and policies such as government expenditure on infrastructure, import restrictions, exchange rate policies. Therefore, macroeconomic policies imposed by governments seem to be essential to fix market (Amsden, 2001; Wade, 2005; Stiglitz, 2005). East Asian “miracle” economies were not exemplars of imposing free-trade policies. Governments of these countries used the tools of economic planning, directive policies and regulation to transform their economies on the progressive way (Chang, 2014).

In addition to these particular policies imposed by the East Asian countries, circumstances of international relations have also significant effects for the countries to be able to manage industrial development. Stiglitz (2005) claims that the East Asian countries have the chances to take advantage of the Cold War between the United States and the Soviet Union. There was no pressure on these countries to open their economies to international trade, and they were not questioned about patent rights. In other words, East Asian countries have made use of freedom of imposing different policies and thus there was a favorable atmosphere for industrial development.

All industrialization stories imply that comparative advantage has not been taken as given. In some countries there have been transformation of the economies from low-value products to high-value product and they have managed to industrialize their economies. Neoliberal economic ideas are not able to explain this past industrialization experiences. These experiences indicated that industrialized countries developed advanced and skilled industries that required high initial-costs through government interventions. There is enough evidence supporting the central role of government intervention on industrial development. United States and Germany and more recently East Asian countries used government intervention policies to carry out industrialization. The distant past experiences of industrialization and the recent past developments of East Asian economies indicate that government intervention generated the required climate in which investors could be able to take risks and invest to contribute industrial development (Siddiqui, 2015). According to the Human Development Report issued by UNPD (2003), China and East Asian countries gradually eradicate tariff barrier, the capital account of China has not been fully liberalized; these countries have not adopted the neoliberal policies known as Washington Consensus. In contrast to the suggestions



of the global economic institutions, industrialization and trade policies were used effectively in these countries.

Shafaeddin (1998) notes that even if different countries did not use precisely the same track, they all learned from the experience of others; the United States learned from United Kingdom, Germany from the United States, Japan learned from Germany and the South Korea from Japan. In all these countries, government intervention was fairly comprehensive. They used functional and selective public policies to support saving and investment. These policies helped for countries to develop essential infrastructure and institutions. The historical cases point out that the countries in their early stage of industrialization used selective protective policies through defining strategic sectors. Trade liberalization was put into agenda selectively and step by step after the protected industries had been fully-fledged industries (Shafaeddin, 2010; 17). Degree of trade openness should be adjusted with respect to the level and size of economic development, the structure of existing institutions. Governments can use industrial policy as an effective tool to support favorable structural change and economic growth. The sophistication level of export structure seems to be affected positively by education level. The relation between level of export structure and education level suggests that a country's competitiveness depends on skills and education of its labor force. In the first steps of industrialization, public support for education and occupational training appears to be essential. In the later steps, public funding R&D expenditures will provide more advanced skilled labor for the more sophisticated industrial sector (Siddiqui, 2015; 244)

The industrialization experience of China looks like to exemplify how industrial policy can be used for development of economies. Chang (2007) claims that, high tariffs were used in China for setting up industrial base like the US, Japan and Korea did. The average tariff rate imposed by China was 30% up to the 1990s. Whereas China's attitude to foreign investment has the encouraging feature, the country implemented some conditions and requirements for foreign firms such as upper limit to foreign ownership, using domestic inputs at the specified proportion. Recently, trade liberalization appears to be beneficial to these countries after all the governmental efforts for adjusting and preparing their economies to international competition. Yet, there are still many countries that are not benefited from trade liberalization. Curtis (2006) points out that African, Latin American and South Asian countries being primary producers have been marginalized while developed and fast growing countries in North America, Europe, and East Asia have done well.

The empirical literature on the relationship between trade liberalization and economic growth gives ambiguous results. On the one hand, the studies of Clemens and Williamson (2001), Harrison (1996), Irwin (2002) and Rodríguez and Rodrik

(2001) and O'Rourke (2000) do not give supportive results for the benefits of trade openness on economic growth. On the other hand, Dollar (1992), Barro (1991), Sachs and Warner (1995), Frankel and Romer (1999), Edwards (1998) and Wacziarg (2001) indicate that there is a positive effect of openness on growth. Besides, using case studies, Greenaway (1998) finds out that the effect of trade liberalization on growth can be either positive or negative. Papageorgiou et al. (1991) had the results of saying that trade liberalization positively affects economic growth. Wacziarg and Welch (2008), based on the panel data, reached the results showing that there is a significance difference between the growths of liberalized and non-liberalized countries. Irwin et al. (2002) discovered that being more open economies has the effect of higher level of GDP per capita. Greenaway et al. (2002) estimated dynamic panel model and they got the findings of a J-curve model; after liberalization growth firstly declines then it increases. The findings of Salinas and Aksoy (2006) support that the argument of promoting effect of liberalization on growth. By using GMM modelling, Christiansen et al. (2013) and Chang et al. (2009) resulted that liberalization generates benefits for economic growth. Finally, Naito (2017) used Melitz model and unilateral liberalization has the positive effect on growth for all countries.

### 3. Methodology and data

The paper examines the relationship between GDP per capita and trade openness of countries through the estimated panel time series models. There are 83 countries including developed countries and developing countries. Dependent variable is GDP per capita of countries; trade openness (%GDP) involved as an independent variable in the research models. The data for the variables belong to the period of 1960 - 2018. Data on countries' GDP per capita and trade openness were derived from the database of the World Bank. The notations for the variables used in the paper are as follows;

$GDPpc$  : GDP per capita of countries

$OPENNESS$  : Trade Openness of countries (%GDP)

In line with these information, the functional model below was used to estimate the panel time series model in order to study the relation between the economic development and trade openness;

$$\ln(GDPpc)_{it} = \beta_0 + \beta_1 OPENNESS_{it} + \varepsilon_{it} \quad (1)$$

We use the log-t convergence test and panel time series methods to analyze the effects of trade liberalization on economic development in 83 countries between 1960 and 2018 in this paper. Convergence in economics theory remarks the hypothesis saying that all economies would converge in terms of per capita output in the long run (Baumol, 1986; Bernard and Durlauf, 1995; Barro and Sala-i-Martin, 1997). Accordingly, convergence analysis is performed primarily for the covered countries in terms of per capita income.

Phillips and Sul (2007) assert that in order to examine the convergence as part of heterogeneity among individuals and to analyze the development of heterogeneity in time and between groups, it is essential to use additional econometric technics. We employ GDP per capita to test for convergence in incomes across countries.

Within the scope of the paper, Lee and Strazicich LM unit root test is applied to determine the dates of structural break that occurred in the trade openness of world as representation of globalization. In the analysis, LM test of Lee and Strazicich (2003) which permits for two breaks in both level and trend is employed. Following Lee and Strazicich (2003), the LM unit root test can be gained from the regression (2);

$$\Delta y_t = d'\Delta z_t + \phi \tilde{S}_{t-i} + \sum_{i=1}^p \gamma_i \Delta \tilde{S}_{t-i} + \eta_t \quad t = 1, \dots, T \quad (2)$$

Furthermore, it is necessary to perform unit root test of the series. While the first generation panel unit root tests do not take into account the cross-sectional dependency, the second-generation unit root tests perform analysis considering the cross-sectional dependency. It is preferred Breusch-Pagan (1980) LM Test (3,4), Pesaran LM Test and Pesaran's CD (2004) cross sectional dependence test (5) in order to take more consistent results in the analyzes. Test statistics of cross-sectional dependence are as below;

$$LM = T \sum_{i=1}^{N-1} \sum_{j=i+1}^N \rho_{ij}^2 \sim \chi_{N(N-1)/2} \quad (3)$$

$$\rho_{ij}^2 = \frac{\sum_{t=1}^T e_{it} e_{jt}}{(\sum_{t=1}^T e_{it}^2)^{1/2} (\sum_{t=1}^T e_{jt}^2)^{1/2}} \quad (4)$$

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left( \sum_{i=1}^{N-1} \sum_{j=i+1}^N \rho_{ij} \right) \quad (5)$$

To determine a unit root in the panel data, the Pesaran (2003) cross-section augmented Dickey-Fuller (CADF) test were used. Accordingly, the simple CADF regression for the series on the i<sup>th</sup> cross-section unit at time t (y<sub>it</sub>) is below (6);

$$\Delta y_{it} = a_i + b_i y_{it-1} + c_i y'_{t-1} + d_i y'_t + \varepsilon_{it} \quad (6)$$

where  $y'_t$  is the average at time  $t$  of all  $N$  observations,  $a$ ,  $b$ ,  $c$ , and  $d$  are parameters and  $\varepsilon_{it}$  is the error term. The cross-sectional averages  $y'_t$  and  $\Delta y'_t$  serve as proxies for the effects of an unobserved common factor.

After the determining the stationarity of the panel data, Westerlund (2005) panel cointegration test is performed in order to prove long-term relationships between the variables. Westerlund panel cointegration test supposes panel-specific cointegrating vectors, where all panels have individual slope coefficients. It is created a pair of VR test statistics for the null hypothesis of no cointegration by Westerlund (2005). The panel-specific-AR and same-AR test statistic is calculated by (7,8,9);

$$VR = \sum_{i=1}^N \sum_{t=1}^T \hat{E}_{it}^2 R_i^{-1} \quad (7)$$

$$VR = \sum_{i=1}^N \sum_{t=1}^T \hat{E}_{it}^2 (\sum_{i=1}^N R_i)^{-1} \quad (8)$$

$$\Delta y_{it} = \delta'_i d_t + \alpha_i y_{i,t-1} + \lambda'_i x_{i,t-1} + \sum_{j=1}^{p_i} \alpha_{ij} \Delta \tilde{Y}_{i,t-j} + \sum_{j=-q_i}^{p_j} \gamma_{ij} \Delta x_{i,t-j} + \varepsilon_{it} \quad (9)$$

Dumitrescu - Hurlin (2012) panel causality test is performed to test the causality relationship between the variables. In the Dumitrescu - Hurlin panel causality test, when  $X$  and  $Y$  represent two stationary processes observed during the  $T$  period for  $N$  units, the following linear heterogeneous model is taken into account for each unit ( $i$ ) at time  $t$  (10);

$$y_{i,t} = \alpha_i + \sum_{k=1}^K \gamma_i^{(k)} y_{i,t-k} + \sum_{k=1}^K \beta_i^{(k)} x_{i,t-k} + \varepsilon_{i,t} \quad (10)$$

Finally, the strength of the relationship between the variables is estimated for the region as a whole or for groups of countries by a Panel Dynamic Ordinary Least Square (PDOLS). The following equation states the relationship between the two variables (11);

$$y_{i,t} = \alpha_i + \delta_i X_{i,t} + \sum_{j=-p}^P \gamma_{i,t} \Delta X_{i,t-j} + \mu_{i,t} \quad (11)$$

where  $y_{i,t}$  are GDPpc,  $i = 1, 2, \dots, 83$  countries,  $t = 1, 2, \dots, T$  is the time,  $p = 1, 2, \dots, P$  is the number of lags and advances that in the DOLS regression, while  $\partial \log y_i / \partial \log X_i$ ,  $t = \delta_i$  measures the change in GDPpc when the trade openness as

explanatory variable changes. The coefficients  $\delta$  and the values  $t$  are obtained from the average values in the whole panel through the method of the group averages. The PDOLS estimator is averaged along the dimension among the groups (Neal, 2014), and the null hypothesis indicates that  $\beta_i = \beta_0$ .

#### 4. Empirical results

The results derived by applying the method proposed by Phillips and Sul (2007) to 83 countries' GDP per capita data between 1960 and 2018 are shown in Table 1. According to the convergence test results, there four convergence clubs within 83 countries. On the other hand, Burundi is not in any group. In addition, it is determined that there is conditional convergence within four clubs.

According to GDP per capita convergence results, the number of converged clubs is four and countries in each club converge conditionally. The first club has forty-two countries, second club has twenty-eight countries, third club has eight countries and fourth club has four countries. Lastly, 82 out of 83 countries have a convergence club except Burundi.

**Table 1**  
Convergence Clubs

Clubs	Countries	Coefficient	T-Statistics
<b>Club 1</b>	Australia, Austria, Belgium, Bahamas, Brazil, Canada, Chile, China, Colombia, Costa Rica, Denmark, Dominican Republic, Spain, Finland, France, United Kingdom, Greece, Indonesia, India, Ireland, Iceland, Israel, Italy, Japan, Korea, Sri Lanka, Luxemburg, Mexico, Malaysia, Netherlands, Norway, New Zealand, Panama, Peru, Portugal, Singapore, Sweden, Thailand, Turkey, Uruguay, United States, Venezuela	0.376	9.213
<b>Club 2</b>	Belize, Bolivia, Congo Republic, Algeria, Ecuador, Egypt, Fiji, Gabon, Ghana, Guatemala, Iran, Jamaica, Kenya, Morocco, Mauritania, Nigeria, Nicaragua, Pakistan, Philippines, Saudi Arabia, Sudan, Tunisia, Paraguay, South Africa, Benin, Bangladesh, Honduras, Chad	0.205	6.109
<b>Club 3</b>	Burkina Faso, Cote d'Ivoire, Cameroon, Haiti, Rwanda, Senegal, Togo, Uganda	0.737	20.182
<b>Club 4</b>	Congo Democratic Republic, Madagascar, Niger, Central African Republic	0.303	1.812
<b>Club 5 (Not Convergence)</b>	Burundi	-	-

After determining the country groups as a result of convergence analysis, Lee and Strazicich LM unit root test is applied to reveal the structural break dates in the global trade openness.

**Tablo 2**  
**Lee and Strazicich LM Unit Root Test Results**

	<b>Break Dates</b>	<b>k</b>	<b>Test Statistic</b>
<i>OPENNESS</i>	1988, 1994	8	-4.271
<b>Critical Values</b>	%10 : -3.296 ; %5 : -3.563 ; %1 : -4.073		

Table 2 indicates the results of Lee and Strazicich LM unit root test under two structural breaks in the series. According to results of unit root test with two structural breaks, the variable *OPENNESS* does not have unit roots under two structural break at level form, meaning that variable has two breaks in *OPENNESS* can be rejected, that is, the variable is stationary at their levels. In line with the results, the global trade openness has two structural breaks in 1988 and 1994. Under the circumstances of the dominance of neoliberal policies in 1980s, quite a lot of countries have started to implement export-oriented economic growth within these years. The result suggesting that there is a structural change in openness in 1988 seems to be consistent with the broadly implemented trade liberalization policies in 1980s.

As the next step after the determination of country groups and calculating the structural break date, Breusch-Pagan (1980) LM Test (3,4), Pesaran LM Test and Pesaran's CD (2004) tests are performed in order to determine cross-sectional dependency.

**Table 3**  
Cross-Sectional Dependence Test Results

Country	Period	Variables	Breusch-Pagan LM Test	Pesaran LM Test	Pesaran CD Test
<b>Club 1</b>	1960-1987	$\ln(GDPpc)_{club1}$	22020.65***	509.91***	148.28***
		$(OPENNESS)_{club1}$	9266.43***	202.56***	83.19***
	1988-2018	$\ln(GDPpc)_{club1}$	21847.07***	505.73***	147.24***
		$(OPENNESS)_{club1}$	9565.21***	209.76***	56.39***
<b>Club 2</b>	1960-1987	$\ln(GDPpc)_{club2}$	9256.14***	322.89***	96.11***
		$(OPENNESS)_{club2}$	2045.65***	60.65***	23.15***
	1988-2018	$\ln(GDPpc)_{club2}$	9223.95***	321.72***	95.72***
		$(OPENNESS)_{club2}$	2122.92***	63.46***	20.43***
<b>Club 3</b>	1960-1987	$\ln(GDPpc)_{club3}$	631.81***	80.69***	24.94***
		$(OPENNESS)_{club3}$	382.12***	47.32***	10.41***
	1988-2018	$\ln(GDPpc)_{club3}$	697.69***	89.49***	26.35***
		$(OPENNESS)_{club3}$	166.81***	18.55***	10.93***
<b>Club 4</b>	1960-1987	$\ln(GDPpc)_{club4}$	110.93***	30.29***	10.42***
		$(OPENNESS)_{club4}$	14.74**	2.52**	0.01
	1988-2018	$\ln(GDPpc)_{club4}$	98.18***	26.61***	9.79***
		$(OPENNESS)_{club4}$	56.59***	14.61***	1.89*

Note: \*\*\*, \*\*, and \* indicate significance at 1 %, 5 % and 10 % respectively.

The results of the cross-sectional dependence tests are in Table 3. According to the results, GDP per capita and trade openness variables have cross-sectional dependence in all clubs. Therefore, second generation unit root tests that considering cross-sectional dependence will be applied to all series.

**Table 4**  
PESCADF Unit Root Test Results

Country	Period	Variables	Level		First Difference	
			C	C+T	C	C+T
Club 1	1960-1987	$\ln(GDPpc)_{club1}$	-1.452	-2.089	-2.246***	-3.357***
		$(OPENNESS)_{club1}$	-1.737	-2.027	-2.701***	-2.796***
	1988-2018	$\ln(GDPpc)_{club1}$	-1.533	-1.668	-3.392***	-3.405***
		$(OPENNESS)_{club1}$	-1.943	-2.247	-3.402***	-3.581***
Club 2	1960-1987	$\ln(GDPpc)_{club2}$	-1.299	-2.228	-2.305***	-3.596***
		$(OPENNESS)_{club2}$	-1.845	-2.138	-3.875***	-3.964***
	1988-2018	$\ln(GDPpc)_{club2}$	-1.748	-1.961	-2.464***	-2.809***
		$(OPENNESS)_{club2}$	-1.839	-2.186	-3.680***	-3.775***
Club 3	1960-1987	$\ln(GDPpc)_{club3}$	-2.114	-2.421	-3.167***	-3.400***
		$(OPENNESS)_{club3}$	-2.107	-1.890	-2.629***	-3.301***
	1988-2018	$\ln(GDPpc)_{club3}$	-2.073	-2.324	-3.701***	-3.883***
		$(OPENNESS)_{club3}$	-1.931	-2.168	-4.414***	-4.531***
Club 4	1960-1987	$\ln(GDPpc)_{club4}$	-1.218	-1.775	-3.705***	-3.925***
		$(OPENNESS)_{club4}$	-1.772	-1.785	-4.052***	-4.008***
	1988-2018	$\ln(GDPpc)_{club4}$	-1.994	-2.340	-3.122***	-3.108**
		$(OPENNESS)_{club4}$	-2.026	-2.094	-2.946***	-4.118***

Note: "C" stands for constant term, "C + T" represents constant and trend. \*\*\*, \*\*, and \* indicate significance at 1%, 5% and 10% respectively.

PESCADF second-generation unit root test results offered by Pesaran (2003) are shown in Table 4. The results indicate that all of the series are not stationary at their levels, however, they are stationary at their first differences. For the panel time-series data featuring unit root at their levels, it is appropriate to perform a panel cointegration test to determine whether the analyzed variables have a long-run relationship.



**Table 5**  
Westerlund Cointegration Test Results

Country	Period	VR Test Statistics	P-Value
<b>Club 1</b>	1960-1987	4.557	0.000
	1988-2018	3.879	0.000
<b>Club 2</b>	1960-1987	7.896	0.000
	1988-2018	7.065	0.000
<b>Club 3</b>	1960-1987	2.852	0.002
	1988-2018	1.694	0.045
<b>Club 4</b>	1960-1987	1.836	0.033
	1988-2018	-0.459	0.323

In order to reveal the presence of cointegration between GDP per capita and trade openness, the Westerlund (2005) panel cointegration test that considers cross-sectional dependence is imposed. Table 5 reports the results of Westerlund (2005) panel cointegration test. The results show that there is a cointegration relation in club 1, club 2 and club 3 for the years 1960-1987 and 1988-2018. On the other hand, it is revealed that there is a cointegration relationship in club 4 for the years 1960-1987, whereas there is no cointegration relationship between 1988 and 2018. This means that there are long-run relationships between trade openness and GDP per capita for the countries which are more developed than others such as club 1, club 2 and club 3. The long-run relation between trade openness and GDP per capita has disappeared after 1987 for countries in club 4.

**Table 6**  
Dumitrescu-Hurlin Panel Causality Test Results

Country	Period	Causal Direction	Lag	Z-Stats	P-Value
Club 1	1960-1987	$\ln(GDPpc)_{club1} \Rightarrow (OPENNESS)_{club1}$	3	8.785	0.000
		$(OPENNESS)_{club1} \Rightarrow \ln(GDPpc)_{club1}$	3	7.008	0.000
	1988-2018	$\ln(GDPpc)_{club1} \Rightarrow (OPENNESS)_{club1}$	3	5.525	0.000
		$(OPENNESS)_{club1} \Rightarrow \ln(GDPpc)_{club1}$	3	4.048	0.000
Club 2	1960-1987	$\ln(GDPpc)_{club2} \Rightarrow (OPENNESS)_{club2}$	2	10.389	0.000
		$(OPENNESS)_{club2} \Rightarrow \ln(GDPpc)_{club2}$	2	12.974	0.000
	1988-2018	$\ln(GDPpc)_{club2} \Rightarrow (OPENNESS)_{club2}$	2	2.932	0.000
		$(OPENNESS)_{club2} \Rightarrow \ln(GDPpc)_{club2}$	2	6.651	0.000
Club 3	1960-1987	$\ln(GDPpc)_{club3} \Rightarrow (OPENNESS)_{club3}$	2	2.519	0.012
		$(OPENNESS)_{club3} \Rightarrow \ln(GDPpc)_{club3}$	2	4.376	0.000
	1988-2018	$\ln(GDPpc)_{club3} \Rightarrow (OPENNESS)_{club3}$	2	2.209	0.027
		$(OPENNESS)_{club3} \Rightarrow \ln(GDPpc)_{club3}$	2	5.812	0.000
Club 4	1960-1987	$\ln(GDPpc)_{club4} \Rightarrow (OPENNESS)_{club4}$	1	1.715	0.086
		$(OPENNESS)_{club4} \Rightarrow \ln(GDPpc)_{club4}$	1	2.229	0.026
	1988-2018	$\ln(GDPpc)_{club4} \Rightarrow (OPENNESS)_{club4}$	1	0.834	0.404
		$(OPENNESS)_{club4} \Rightarrow \ln(GDPpc)_{club4}$	1	3.882	0.001

Note: Model lags are determined according to Akaike, Schwarz and Hannan-Quinn criteria.

The results about the causality relationships between variables are given in Table 6. According to results, there is a bidirectional causality relationship between GDP per capita and trade openness for countries in club 1, club 2 and club 3 in 1960-1987 and 1988-2018. In addition, there is a bidirectional causality relationship between GDP per capita and trade openness in 1960-1987, while there is a unidirectional causality relationship from trade openness to GDP per capita in 1988-2018 for countries in club 4.

**Table 7**  
Panel Dynamic Ordinary Least Squares Model Results (PDOLS)

Country	Period	( <i>OPENNESS</i> )	T-Statistics
<b>Club 1</b>	1960-1987	0.307	3.716***
	1988-2018	0.833	10.311***
<b>Club 2</b>	1960-1987	2.974	16.474***
	1988-2018	1.434	6.653***
<b>Club 3</b>	1960-1987	2.658	12.318***
	1988-2018	2.109	7.378***
<b>Club 4</b>	1960-1987	1.506	2.933***
	1988-2018	0.117	0.272

Note: \*\*\*, \*\*, and \* indicate significance at 1 %, 5 % and 10 % respectively. GDPpc is dependent variable.

After analysing the cointegration and causality relationships between the variables, the long-term coefficients for the relations between the variables are estimated by using the Panel Dynamic Ordinary Least Square model (PDOLS). Results of PDOLS are shown in table 7. According to the results, trade openness has positive effects on GDP per capita for the countries in club 1, club 2 and club 3 in both of the periods; 1960-1987 and 1988-2018. Moreover, it is revealed that there is a decrease in the long-term coefficient in club 2 (from 2.974 to 1.434) and club 3 (from 2.658 to 2.109), whereas there is an increase in club 1 (from 0.307 to 0.833). On the other hand, trade openness has positive effects on GDP per capita for countries in club 4 in 1960-1987, while there is no statistically significant relationship between trade openness and GDP per capita for countries in club 4 in 1988-2018.

## 5. Conclusion

The relations between GDP per capita and trade openness were analyzed for a great number of countries. For this aim, firstly, the countries were categorized by using the convergence model and the panel data estimation methods were used to avoid the estimation deviation between 1960 and 2018. Applying the convergence models on GDP per capita reveals that countries follow a different convergence path. According to the derived convergence model, it is determined that there are four clubs among the countries. Club 1 is formed mostly developed countries, whereas club 4 consist of completely less developed countries. Besides, the convergence test results demonstrate that club 2 and club 3 are formed developing countries.

Neoliberal trade reforms are expected to help the capital accumulation in developing countries. Thus, these countries would experience better growth performances. As Siddiqui (2015) points out, the rent seeking activities come forward if investors perceive the lower margins of profit in manufacturing sector. Therefore, capital would not fund industrialization; the growth rates of the countries would be at the disappointing levels. Chang (2007) argues that developing countries had much better performances before the impositions of neoliberal policies. Besides, Lee and Cole (1994) and Shafaeddin (2005) argue that most of the developing countries encountered a vast of cheaper imports after the trade liberalization and they could not experience an increase in capability of producing high value-added product. The empirical results obtained in this paper has turned out to be supportive for these arguments.

In the paper, cointegrating relations between trade openness and GDP per capita of countries are examined by using Westerlund panel co-integration method. Westerlund panel co-integration method permits analyzing long-term relationships between the variables. In addition, causality relationship between the variables via Dumitrescu-Hurlin panel causality methods is analyzed. Moreover, the long-term coefficients between the variables is determined by PDOLS model. These empirical approaches give new perspectives to analysis relationships between trade openness and GDP per capita.

Firstly, Westerlund panel co-integration tests are applied to state the long-term relationships between the variables. According to the results, there are a long-run relations between trade openness and GDP per capita for the countries which are more developed than others like club 1, club 2 and club 3. At the same time, the relationship between trade openness and GDP per capita has disappeared after 1987 for the countries in club 4. In line with the results of Dumitrescu-Hurlin panel causality test, there is a bidirectional causality relationship between GDP per capita and trade openness for countries in club 1, club 2 and club 3 in 1960-1987 and 1988-2018. Furthermore, there is a bidirectional causality relationship between GDP per capita and trade openness in 1960-1987, while there is a unidirectional causality relationship from trade openness to GDP per capita in 1988-2018 for countries in club 4. Panel causality results show that relationship between trade openness and economic development has weakened in less developed countries with the globalization process. This result appears to support the argument of Siddiqui (2015) suggesting that the average economic performances of the developing countries in terms of income growth during the trade reform period of 1980s and so on were worse than in the previous period of 1950-1980.

The results of PDOLS reveal that, trade openness has positive impacts on GDP per capita for countries in club 1, club 2 and club 3 both between 1960-1987 and 1988-2018. Moreover, it is revealed that there is a decrease in the long-term

coefficient in club 2 (from 2.974 to 1.434) and club 3 (from 2.658 to 2.109), while there is an increase in club 1 (from 0.307 to 0.833). On the other side, there is no statistically significant relationship between trade openness and GDP per capita for countries in club 4 in 1988-2018, whereas trade openness has positive effects on GDP per capita for countries in club 4 in 1960-1987. Thus, it has been reached to the conclusion that positive effects of trade openness on economic developments have decreased for the underdeveloped and developing countries with globalization. This result supports the analysis of Chang (2002) indicating that developing countries seem to deliver better economic performances before the imposition of trade liberalization policies compared to the performances they delivered after they open their economies to international market. Thereby, these results do not support the hypothesis that increasing the globalization contributes positively to enhance economic developments of underdeveloped and developing countries. It seems possible to overcome this situation by integrating underdeveloped and developing countries into the global economy by establishing appropriate industrialization policies for each group of countries and increasing their value-added exports. As Maddison (1991) argued, there is no universal proposal for trading and economic development. Every single country has own particular economic conditions that are supposed to be taken into account when setting up trading and industrial policies. Shafaeddin (1998) noted the countries did not use precisely the same track and they all learned from the experience of others. They used functional and selective public policies to support saving and investment. By the help of these policies the countries had the chance to develop essential infrastructure and institutions.

Bearing this in mind and considering the empirical results provided by this paper, it can be said that for the countries in their early stage of industrialization might be better to use selective protective policies through defining strategic sectors. Instead of complete and fast trade liberalization process, it seems that it is much better to adjust the degree of trade openness with respect to level and size of economic development, structure of existing institutions. Governments can use industrial policy as an effective tool to support favorable structural change and economic growth. In other words, in addition to strategic trade policies comprehending the growing realities of imperfect markets, economies of scale, research and development, learning by doing and technological spillovers, supporting macroeconomic economic policy along with trade liberalization works for promoting economic growth.

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## Özet

### Ticari liberalizasyon, dışa açıklık ve ekonomik büyüme: Küresel ekonomi için bir panel zaman serisi analizi

Ülkelerin uluslararası ticaret vasıtasıyla uluslararası ekonomik sistem ile bütünleşmeleri arttıkça, ekonomik olarak daha fazla kalkınmaları beklenmektedir. Bu doğrultuda geleneksel görüşler, küreselleşme sürecinin etkisiyle ülkelerin uluslararası ticaretlerini libereleştirdiği ve ülke pazarlarını küresel pazar ile bütünleştirdiği için ekonomik kalkınmalarını hızlandırdığını ileri sürmektedir. Ancak, zaman içerisinde bu görüşe karşı teorik ve uygulamalı analizlerden gelen önemli itirazlar olmuştur. Bu nedenle, ülkelerin ticari açıklığı ile kişi başına düşen gayrisafi yurtiçi hasılları arasındaki ilişkinin değerlendirilmesi önem kazanmaktadır. Bu makale, panel zaman serisi yöntemleri vasıtasıyla küreselleşme sürecindeki 83 ülke için, kişi başına gayrisafi yurtiçi hasıla ile ticari açıklık arasındaki ilişkiyi 1960-2018 dönemi çerçevesinde analiz etmektedir. Makalenin temel sonucu, küreselleşme sürecinin gelişmekte olan ülkelere gelişmiş ülkeler kadar faydalı olmadığıdır. Gelişmekte olan ülkeler için ticari açıklığın ekonomik büyüme üzerindeki olumlu etkisinin, ticareti serbestleştirme politikalarının yoğun bir şekilde uygulandığı süreçlerde ciddi şekilde zayıfladığı tespit edilmiştir. Ayrıca, az gelişmiş ülkelerde serbestleştirme politikalarının benimsendiği dönemlerde, bu ilişkinin ortadan kalktığı görülmektedir.

*Anahtar kelimeler:* Küreselleşme, Ticari Liberalleşme, Ticari Açıklık, Kalkınma, Panel Eşbütünleşme