VILNIUS UNIVERSITY

FACULTY OF ECONOMICS

Mariam Kozashvili

TRADE LIBERALIZATION, ECONOMIC GROWTH, AND INEQUALITY IN DEVELOPING COUNTRIES

Master thesis

A Master student_ M. Kozashvili

Academic supervisor Assoc. Prof. A. Miškinis

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Introduction

Relevance of the topic

Trade liberalization - reduction of restrictions or barriers on the free exchange of goods between nations – is the subject of constant discussion by various scholars and economists from the last two centuries to the present. How beneficial this event is for developing countries with vulnerable market? How free trade will increase the country's economic growth if this country is mostly depended on import? How weak economies will be able to develop compared to developed countries with strong production and comparative advantages? Will trade liberalization only deepen inequality between countries or it contributes to the development of all countries? These are questions that that underlie the controversy surrounding trade liberalization. For now, the only thing that is clear is that trade liberalization has had a profound effect on the last few decades and over time a thorough investigation of this issue becomes more and more crucial.

The liberalization of trade policy with the results so far has led us to the following results: according to Sixty-sixth season of United Nations Conference on Trade and Development (2019), trade reforms in developing countries was followed by rapid economic growth, income gaps reduction between countries and overall income per capita gap reduction between developed and developing countries. Economic growth is particularly noticeable in countries like Brazil, China and India. According to data from 2013 Trade liberalisation declined global poverty from 35% to 10.7% and increased income of bottom 40% percent of the world's population by 50 percent (Revenga and Gonzalez, 2017). However, despite the above-mentioned growth rates and development, there is a reasonable assumption that Achieving sustainable economic growth is necessary, but not enough in a globalized world. To ensure overall social benefits, which is a necessary condition for long-term success, a certain level of social justice and equality must be achieved and maintained. Otherwise, social diversification, poverty and revolt, leading to social, economic, and political chaos, are inevitable in the long run (Çelik & Basdas, 2010). Accordingly, there is a question, in the condition when half of the global wealth is owned by richest one percent and the remaining half is owned by 99 percent population in the world, what is real benefit of trade liberalization for developing countries?

Level of investigation of the topic analysed and research gap.

In relation to inequality some economists suggests that trade liberalization is beneficial for all countries, but it is much more beneficial for countries that has stronger market and production factors and for most developing countries, that are mostly depended on import and has lower productivity, trade liberalization just deepen inequality. That is the reason why the reversal of the global economic was accompanied by unexpected rise in inequality between developing countries.

Research question (problem).

Our findings suggest that trade liberalization has a positive impact on the economic growth of a developing country. On the other hand, in the second part of our study we did not find enough evidence that trade openness can exacerbate inequality between countries.

Aim of the master thesis

The purpose of this paper is to understand what are the real benefits that trade liberalization can bring to developing countries. To do this, we have examined, on the one hand, the impact of trade liberalization on the economic growth of developing countries and, on the other hand, the impact of liberal trade policies on increasing inequality between countries.

Research Objectives

1. Suggest fresh perspective about possible impact of trade liberalization on the economic growth of developing countries
2. Examine if different degree of open trade can influence dissimilar effect on the economic growth of developing countries.
3. Assess the link between trade liberalization and the deepening inequality between developing countries

Novelty of the master thesis

Our framework will suggest a fresh perspective whether readiness for liberal trade is an important driving force of developing countries economic growth and what is a threat that the benefit coming from trade openness can be disordered by inequality followed trade liberalization.

Research methods

Our methodology is divided into two parts. In the first part, we examined trade liberalization effect on developing countries economic growth via using panel data regression

fixed effect model, on 10 developing countries data, which was collected from 2006 to 2019 from World Bank database. For exploring if above mentioned influence is changing across degree of trade liberalization, we divided our sample of the countries into two sub group, from which first includes only liberal countries' and second group only protective countries. For our sub-groups we used same panel data regression method and compared given results to each other to see if there is any significant difference followed by trade openness degree changes. In the research trade liberalization indicator is export+import as a part of total GDP, and economic growth indicator is countries GDP growth.

In the second part of the research, we investigated trade openness effect on inequality between countries on same sample and two sub-sample countries. To taste the trade liberalization effect on between country inequality we applied panel data least square random effect model for liberal and protective country groups that gave us effect comparison opportunity. In this part of research, trade liberalization indicator is export+import as a part of total GDP and inequality indicator is countries GINI index.

Trade liberalization rationale and outcomes

The chapter proceeds as follows. In this section, we will introduce theoretical background about free trade, in which we will define one of the main theories and facts about trade liberalization, the difficulties that preceded international trade, the circumstances in which countries realized the need of free tarde, and the waves of trade liberalization with its outcomes. At the end of the first part, we will show outcomes of multilateral and bilateral trade agreements for the world economy, poverty and development.

A theoretical background for free trade

While trade is considered as one of the main drivers of economic growth, development, and social well-being, no one can say exactly how many centuries ago the first trade took place or who came up with the idea of switching from one product to another. The fact is, however, that the twentieth century turned out to be a period of unprecedented development and growth in international trade.

One of the famous and most popular concepts of the benefits of trade, which may be considered one of the main driving forces behind trade liberalization was created as early as the beginning of the nineteenth century. The theory of comparative advantage was developed by the English scholar and politician David Ricardo in 1817. According to which comparative advantage is an economy's ability to produce a particular good or service at a lower opportunity

cost than its trading partners. The main idea of the economic concept is that the opportunity cost is the potential benefit that a person loses when choosing a particular option over another. Following the opening of borders and the start of trade between countries, the concept suggests that countries will start trading goods with each other in which they have a comparative advantage, thus increasing the profits and productivity of both countries (Hayes, 2020). The main idea of Ricardian model is that having comparative advantage is not only for them who is best at something. Trade is beneficial for unskilled people/economies as well, because there is always something in which you don't have absolute advantage, but your alternative opportunity cost is lower than others. Simply put, beside comparative advantage, advantage of trade is clearly exchange logic. Whereas most countries live in different climatic zones and that ensures diversity of resources, countries have different kind of goods that is excessive or deficient and if you have something ones need and if someone have something you need, trade makes both side better off (The Library of Economics and Libert, 2020). However, is international trade subject to the simple logic offered by Ricardian model? The past has shown that the path of trade development as well as its acceptability and consequences is a much more complex phenomenon.

A large body of research suggests evidence that one of the first act of trade liberalization took place in nineteenth century when France and Great Britain made free trade agreement in 1860 called as Cobden-Chevalier Treaty. With this treaty ended tariff barriers on products such as wine, brandy and silk goods from France, and coal, iron, and industrial goods from Britain (Tena-Junguito, et al., 2012). Whereas others suggest that, the main necessity of trade liberalization come up in the first half of the twenty centuries. In that time, the United States made huge trade barriers because of the belief that U.S. producers "could not successfully compete against foreign producers due to lower foreign wages and production costs which erected high tariff walls to shield the U.S. market from foreign competition" that greatly contributed to the aggravation of the Great Depression. Resulting of which in 1930s world trade fell by 70 percent and millions of people lost their job (Berkeley, 2007).

During this time, protectionism became the main survival lever for most developing countries. Most of the countries adopt restrictive trade policy, and industrialization in terms of protective walls of quotes and tariffs, lost its real direction and only become the tool of saving foreign exchange for debt payments. During this time developing country's main goal was to protect domestic market from import and increase export volume, they were trying to promote export via making special schemes for the exporters, that were included some special licenses

and duty drawback schemes. However, time showed that protecting imports and promoting exports were simultaneously difficult and the countries that were trying to protect domestic market from the import experienced a big loss in the form of reduced exports, since any kind of import restrictions can create serious anti-export bias by raising the price of importable goods compared to exportable goods (Santos-Paulinio, 2000). Beside export problems, many countries recognized that by restrictions they were able to keep imports out, but instead, raise barriers to trade decline in demand for foreign exchange, what led to an appreciation of the currency and accordingly high taxes on exports of commodities and industrial goods (Dornbusch, 1992). After World War II trade policies' changes a bit. In one hand, some industrial countries were continued maintenance of high restrictive trade policies, on the other hand, the fact that commodity prices collapsed again, gave a impetus to some industrial countries to update trade and exchange policies. From that time industrial countries started moving gradually in the direction of trade liberalization (Dornbusch, 1992).
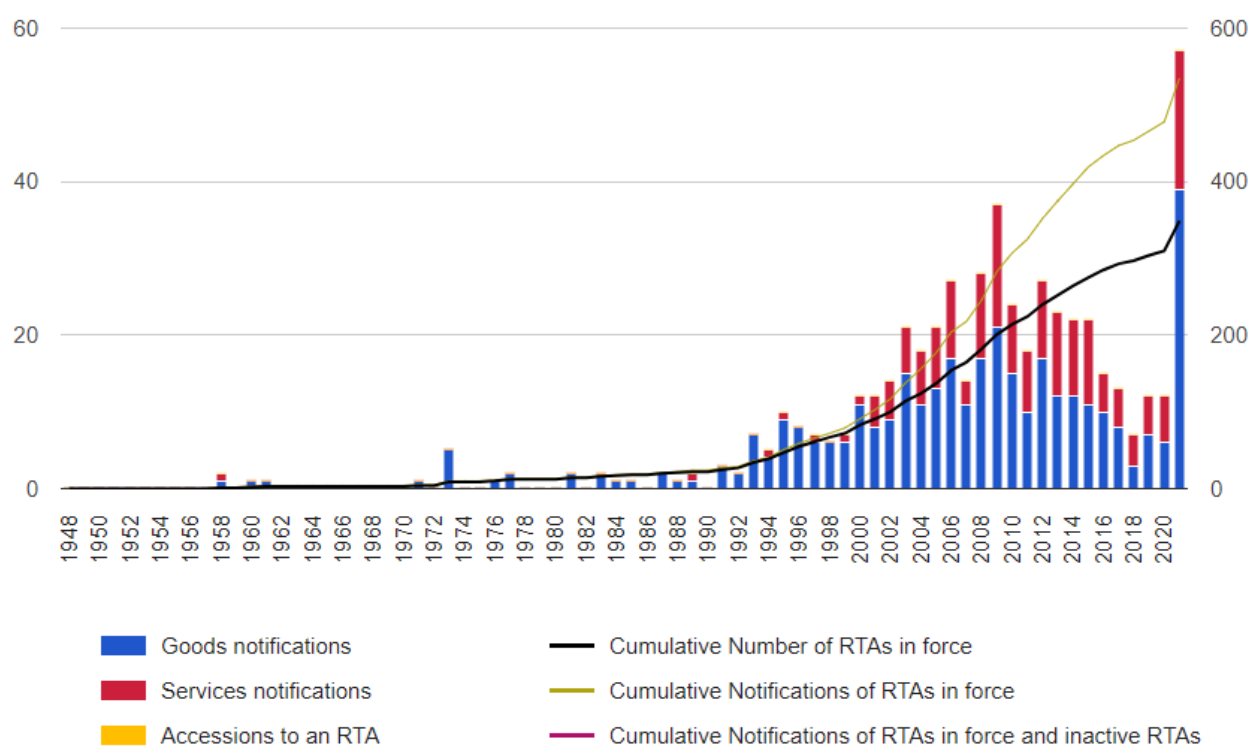
1st wave of trade liberalization - GATT

Big depression made it clearer that protectionism may be detrimental to the future development of economies. Countries started thinking about trade as an integral engine of the world's economic progress in response to which the major countries of the world set up the General Agreement of Trade and Tariffs (GATT). From 1948, when GATT was signed by different countries a new page has been opened in the world economy on the importance of trade. GATT and then its successor the World Trade Organization (WTO) were main driving force to restore the war-torn economy in Europe, increase the standard of living of the population, provide greater prosperity, health, and wider choices by increasing the range (Berkeley, 2007). With the same enthusiasm developing countries like Argentina, Chile, Korea, Ghana, and Botswana have been shifting from severe and destructive protection to free trade fever, even more, Mexico, for example, that had very protective policy made a free trade agreement with Canada and the United States as well as Argentina and Brazil have entered free trade agreements (Dornbuch, 1992). Time to time the number of signatories to a multilateral trade agreement increase from 15 to 123 countries. During those years, the agreement promoted and secured the liberalization of much of world trade. Continual reductions in tariffs alone helped high rates of world trade growth during the 1950s and 1960s — around 8% a year on average. After raising huge interest, GATT laid the foundation for the creation of a new international trade organization, and on January 1, 1995, the World Trade Organization was established. Over the past 60 years, the WTO and its predecessor organization GATT have

helped to create a strong and prosperous international trading system, thereby contributing to unprecedented global economic growth. The WTO currently has 164 members, of which 117 are developing countries or separate customs territories (WTO, 2020).

2nd wave of trade liberalization - FTA

The fact that at the end of the twentieth century trade acquired the status of a life force for the development of the countries´ economies is well reflected in the increase in the number of regional trade agreements. By the 1990s, the number of world trade agreements was only fifty, whereas this number by 2020 increased to 349, see Figure 1, of which the largest and most important are the agreements; the North American Free Trade Agreement (NAFTA), Central American-Dominican Republic Free Trade Agreement (CAFTA-DR), the European Union (EU) and Asia-Pacific Economic Cooperation (APEC). (World Bank, 2018-20).

Figure 1. Evolution of RTAs, 1948 – 2021

World Trade Organization, 2020.

Outcomes of multilateral and bilateral trade agreements

One might assume that the sharp increase in the popularity of trade liberalization is not accidental and is due to the benefits of a certain nature. Firstly, nations can benefit from the production of specialized goods and services, focus on those products in which they have a comparative advantage, and establish their place in the world market. Secondly, if the trade increases efficient production, it will lead everyone to increased choices, better goods, lower prices, and more overall benefit. There is serious tendency that trade can advance competition and motivate business to increment innovation, for being always competitive (Berkeley, 2007). Thirdly, according to a World Bank Group study, deeper trade agreements facilitate trade, foreign investment and the global value chain, as such agreements not only reduce trade costs but also improve political cooperation between countries, which in turn provides greater international investment and social welfare. A concrete example of the benefits that was followed by joining the WTO and engaging in international trade is China. Country maintains 16 Free Trade Agreements (FTAs) with its trade and investment partners and is negotiating or implementing an additional eight FTAs. China also has bilateral investment agreements with over 100 countries and economies, including Austria, the Belgium-Luxembourg Economic Union, Canada, France, Germany, Italy, Japan, South Korea, Spain, Thailand, and the United Kingdom (International Trade Administration, 2021). In response to trade reform in China there was a dramatic decline in poverty in the first few years of the 1980s; the rural poverty rate fell from 76 per cent in 1980 to 23 per cent in 1985 (Ravallion, 2005). China experienced one of the largest gains in export too. China's shear in global export increased from 1.3 percent in 1985, to 2.2 percent in 1995, 6.2 percent in 2005, and 12 percent in 2015 (Pavcnik, 2017).

To better identified the development of trade and to understand how important the contribution of GATT was and how important role has WTO now, we should highlight that because of extremely effective negotiations and concessions we get that 2019 the world's applied tariffs were about 9%, whereas for 1996 that indicator was 11.1% and 20% to 30% in 1947. What can we say about trade volume is that, for today compared to 1950s the world trade volume are roughly increased 40 times that is about 3983% growth between 1950 to 2020 (Figure 2)

Figure 2. Evolution of trade 1950-2020 (in %).
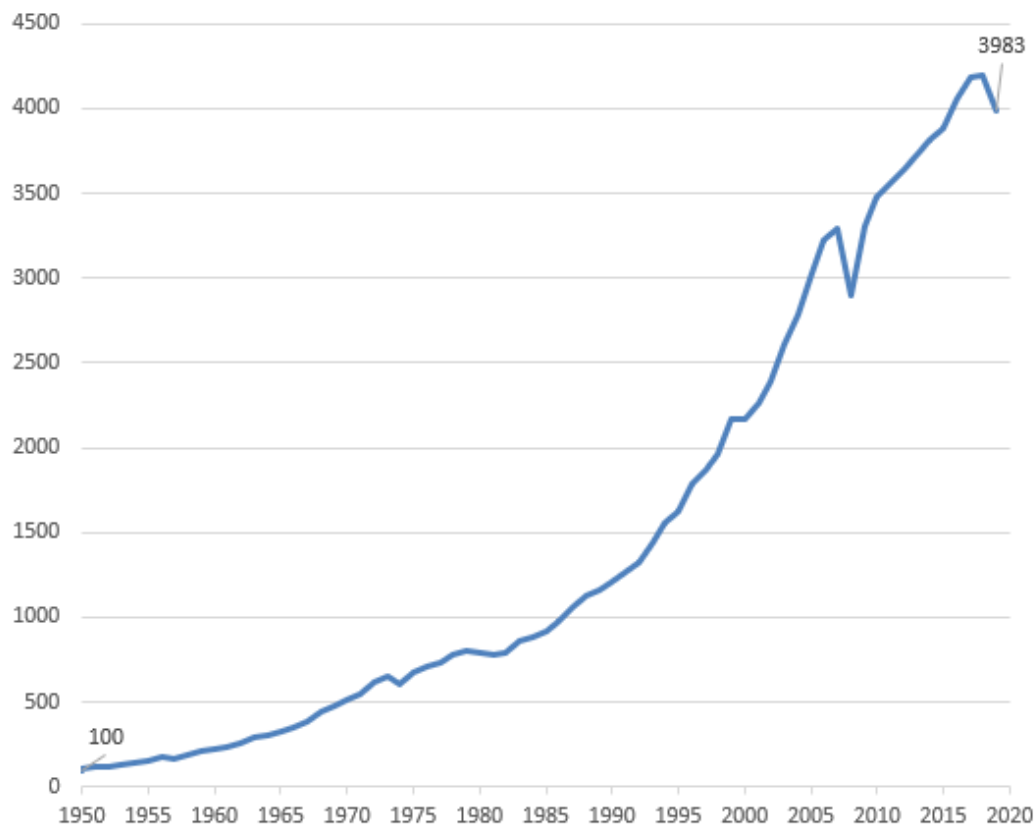
Source: World Trade Organization, 2020

Hence, world trade values in the same time period have ballooned by 275 times and merchandise volume shows trade picking up since WTO established, that is increase world merchandise trade volume from 3.8% and to 5.0% in 2020 (World Trade Organization, 2020).

Trade liberalization and economic growth in developing countries.

The impact of trade liberalization in developing countries has been questioned for a variety of reasons. Some well-known articles suggest that liberal trade has dominant positive and significant impact on production and growth in developed countries (Krugman, 1990., Bond et al., 2005). Others argues that open trade policy impact is mainly depended on different economic, social, and political contexts, as well as the correlation whether types of reforms implemented, business regulations, infrastructure, corruption, bureaucratic quality, investment risk, socioeconomic conditions, democracy and the level of property rights protection, therefore impact may be highly heterogeneous across countries (Herzer, 2011., Santos-Paulinio, 2000). While many economists assumes positive impact of trade on economic growth or arguing about the heterogeneity of the trade effect, some researchers suggest that liberal trade may have a negative impact on economic growth (Kim and Lin, 2009). To take a deeper

look at the topic examined by different authors in different time periods, the following part of the paper will be devoted to review of various well-known studies about trade liberalization effect on economic growth in developing countries.

Expected positive effects of liberal trade

According to the knowledge accumulated over the years, market openness for the countries has positive effect on the economic growth, FDI, export, import and remittance of the country and it is the merit of the trade liberalization that welfare of the society gets higher and higher over time (Manni and Afzal, 2012). Observation on free trade outcomes, made it visible that macroeconomic evidence provides dominant support for the positive and significant impact of trade on production and growth. In the large body of literature, several main factors are viewed positively. For example, since developed countries have comparably small markets, people have low per capita income and the economics are characterised by having labour intensive services, agriculture and manufacturing, a trade liberalization allows companies that produce low-cost products to expand their segment and be competitive in the international market. On the other hand, open trade regime permits enjoyment of constant returns to scale over a much wider range (Krugman, 1990, Bond et al., 2005). Another important positive factor is the prevailing view that free trade improves the transfer of new technologies, promotes technological progress and productivity, and that these benefits depend on trade policy openness. Therefore, countries can benefit not only from increased trade but also by promoting the dissemination of knowledge and technology from the direct import of high-tech goods (Almeida and Fernandes, 2008).

Despite the listed processes, thanks to which countries can improve their own economic situation there is a natural question that every person might have when thinking about above-mentioned trading benefits. How small economies can compete with emerging production in large economies? As Bond, 2005, tried to answer this question by developing a dynamic general-equilibrium framework and proposed that even in the absence of domestic markets, if only the wage rate is low enough, it can make locally produced commodities competitive on world markets. In addition, the positive impact of trade specifically for small economies is reflected in the opportunities of reallocating of factors of production to modern export sectors where experience is increasing and as a result, they will be able to enjoy more rapid rate of economic growth (Bond et al., 2005). The positive effects of economic growth and trade liberalization can be also explained by the assumption that countries with comparative disadvantage in some production have some oversupplied resources, which, if redistributed in

other economies, could be used much more efficiently. furthermore, if the country have some comparative advantage, with lower tariffs and easier trade they can increase their efficiency as well (Zahonogo, 2016). Existing views on the positive effects of international trade on the economies of developing countries, is show in countries example too, according to which the developing countries like Bangladesh, Sri Lanka, India, showed extreme income growth and poverty reduction (Kraay and Dollar, 2001). On the example of a specific developing country the study of reforms and growth in Bangladesh economy by the method of quantitative analysis showed that greater openness has a favourable effect on economic growth of Bangladesh, and in these cases, there were both real export and imports growth with greater openness (Manni and Afzal, 2012).

The expected effect of protectionism on economic growth

During defining the benefits of trade openness, it is also interesting to note what the country's economy is "losing" as a result of trade liberalization. Protectionism, which was very popular in the last century, caused the quite controversial effects. The empirical results, of the study about trade openness effect on growth, using cross-country regressions on data from more than 100 countries, indicated that excessive regulations restrict economic growth, because resources are prevented from moving into the most productive sectors and to the most efficient firms within sectors what by itself can hinder as particular countries as overall development (Bolaky and Freund, 2008). Whereas undoubted positive effect of integration into the international market is questionable in the research of (partial) associations over 1975-1994. The research showed relationship between average tariff rate, coverage ratio for nontariff barriers to trade and economic growth is only slightly negative and nowhere near statistical significance. With this study, Rodriguez and Rodrik establish their own sceptical attitude that there is not a strong negative relationship in the data between trade barriers and economic growth (Rodriguez and Rodrik, 2000). Mentioned outcome does not mean that trade for developing countries may lead to regression, but it should be noted that if we rely on this study, developing countries can achieve rapid economic development in terms of protectionism too.

Blakey and Freund with their cross-country regression method argues that there is not any important positive effect that trade openness may have on countries economic development if country is opening trade with the various protectionist restrictions. Moreover, in terms of excessive regulations trade may hamper growth. Because all the benefits coming from trade may be lost if government. For example, regulating trade volumes artificially, can lead country increasing trade in the wrong good i.e., in goods where comparative advantage does not lie,

therefore, country can only get positive impact of trade liberalization on economic growth after removing protectionist restrictions completely (Bolaky, and Freund, 2008).

Impact of open trade on country's export and import

For more persuasiveness, it is also important to define what impact trade liberalization may have on developing countries' exports and imports. For countries with weaker economies, increase in exports is undoubtedly a positive event, as the increase in exports is related to resource allocation, economies of scale, and technological spillovers. Therefore, we can say that if there is serious link between trade liberalization and export growth it would be significant positive side of trade openness for developing markets.

According to Santoso-Paulino, 2000, who was researching the impact of trade liberalisation on export growth for a sample of developing economies, by using the export demand function approach, there is a serious links between trade liberalisation and exports. The mentioned result was led by the discussion that one of the main driving forces of exports and diversification promoting are activities like, moving on from import substation industrialisation strategy, anti-export bias in structure of import protection, and correction exchange distortions. Therefore, the countries that want to be part of the global market and promote export need to consider liberalising their trade policy that will reduces anti-export bias and make exports more competitive in international markets. Since the policy of liberalization includes itself reducing exchange rate distortions and export duties, economies with more open boarders can get benefits from greater export (Santoso-Paulinio, 2000). The data also support this theory. In favour of the positive effect of trade liberalization, it can be said that the share of low- and middle-income countries in world exports has almost doubled in the last three decades. For example, the growing share of low- and middle-income countries, which together accounted for 12 percent of world exports in 1985, increased to 14 percent in 1995, 21 percent in 2005, and 29 percent in 2015. But interesting fact inside this numbers is that this growth includes China and India, which experienced the biggest gains: from 3.8 percent in 1985 to 17 percent in 2015 - most of which are China from 1.3 per cent in 1985 to 12 percent in 2015 (Pavcnik, 2017). What gives the impression that the results of trade distribution between developing countries also need further research.

On the other hand, country's openness has important influence on growing imports. Santos-Paulino, 2001, analysed the impact of the reduction of tariff and non-tariff barriers on the imports of selected developing countries by dynamic panel data techniques. Research of 22 countries showed that, the effect of the trade or exchange rate policies may be different in

certain economies because it is mostly depended on the size of import and export price, income elasticities, and the level of the growth. Important finding from the study is that after eliminating or removing tariff and nontariff barriers in countries like Colombia, Dominican Republic, Ecuador, India, Korea, Malaysia, Mexico, Chile, Thailand, Morocco, Uruguay, Cameroon, Malawi, and Tunisia the import increased significantly. The influence of trade liberalisation on import growth depicted in percentage shows that in the high restrictive countries import volume increased by 145 percent from 1976 to 1998 but this effect in countries with smaller trade policy distortions has a relatively small impact only 19 percent (Santos-Paulino, 2001). As a response on import shear growth, the study done by Zahonogo, 2016, investigated liberal trade policy impact on economic growth in sample countries. The empirical evidence on the research indicates that trade liberalization has significant positive effect on developing countries economic growth but after reaching a certain level, the effect of trade on economic growth begins to diminish, hence relation between trade openness and economic growth is not linear for Sub-Saharan Africa. For rapid development trade is very important, but countries need to productively control import levels, because the study revealed that in terms of export, trade is positive till the export will reach 355,68% of countries GDP whereas in terms of import, trade associated with high economic growth when import level is not more than 33.16%. Since export threshold is unrealistic, we can say that increased exports do not hinder the positive impact of the country's openness, although the same cannot be said about imports, because if the import share in total GDP is more than 34%, we can no longer judge the beneficial effects of trade convincingly (Zahonogo, 2016).

Trade liberalization impact heterogeneity

For more objectivity it should be noted that no matter how many benefits borders opening and trade liberalization might have, the effect of trade liberalization is not homogenous for all countries. Open trade policy impact is mainly depended on different economic, social, and political contexts, as well as the correlation whether types of reforms implemented, business regulations, infrastructure, corruption, bureaucratic quality, investment risk, socioeconomic conditions, democracy, the level of property rights protection, the level of labor regulation, and the degree of primary export dependence (Herzer, 2011., Santos-Paulinio, 2000). Moreover, since these factors are relatively far more marginalized in developing countries than in developed economies, it is important to understand whether excesses or deficiencies of these factors can distorter the positive effects of trade liberalization. About Trade liberalization impact heterogeneity, Singh, 2010, suggests that it is quite unrealistic if

we will say that trade liberalization effect is homogenous for every single economies. Since trade effect on the growth needs to be evaluated with several methodological and measurement such as measurement of trade openness, quality of data, frequency of data, construction of trade policy indices, specification of an econometric model, indigeneity of trade, netting of exports and imports from GDP etc. After we use all these measures properly we can find out that not all trade reforms have been as successful as anticipated especially in developing countries (Singh, 2010).

Kim and Lin's research on trade and growth at different stages of economic development has proved to be relatively radical. They found that trade openness contribution in long-run economic growth is depended on the level of economic development. More specifically, research of 61 countries instrument-variable **threshold regressions approach** over the period of 1960-2000 showed that greater openness to international trade has significant impact on developed countries economic growth whereas this effect for low-income economies is comparably negative and serious beneficial effect of trade liberalization is increasing as economies that are already developed (Kim and Lin, 2009). The reason of this we can find in the reality in which developed countries have lack of investment in human capital, well-functioned financial system, and technology absorption problem (Kim and Lin, 2009, McMillan and Verduzco, 2011).

Whereas one of the main benefits of trade liberalization is sharing and exchange of technological progress and knowledge McMillan and Verduzco's, 2011, study suggested a bit different view. According to which the penetration and assimilation of technological progress in developing countries may be associated with certain obstacles. Since trade openness facilitates the diffusion of technology and innovations, it does not mean that every market is able to adopt technology, because its adaptation depends on a country's absorptive capacity, that is human capital and R&D, financial development governance, and national institutional (McMillan and Verduzco, 2011). Zahonogo, 2016, even offers the view that the economies of developing countries are characterized by a lack of human capital, R&D, a well-functioning financial system, and sometimes high-quality bureaucracy what may be disruptive to take full advantage of technology transfer (Zahonogo, 2016).

The negative impact of trade openness was revealed in well-known study that examined the impact of trade liberalization on the economies of developing countries using heterogeneous panel cointegration techniques for 81 developed and developing countries from 1960 to 2003. Herzer, defines that, the effect of trade liberalization on economic growth must

be highly heterogeneous across countries. Like Kim and Lin, Herzer's research shows that there is a noticeable cross-country difference in trade effect, which gives the result of that trade openness is positive for developed countries and on average negative for developing ones. Different influence on the division of countries between these two categories, according to study can be conditioned by several country-specific factors, primary export dependence, labour market regulations and property rights protection. On the other hands, the degree of factor mobility between sectors, the type of specialization, and the ability of a country to invest in physical or human capital or adopt foreign technology are one of the kay indicators, which determine the utility of trade openness (Herzer, 2011).

Another interesting study belongs to Ulaşan who tried to determine the relationship between trade openness and economic growth with dynamic panel model over the sample period of 1960 to 2000. The study showed that measures current openness, real openness, collected import duties and fraction of open years based on liberalization dates alone does not boost economic growth in developing countries (Ulaşan 2015). Finally, a study of 23 Asian countries using both a static OLS and a dynamic ECM estimation models showed that even though at the regional level both short term and long-term gains from trade are relevant to growth but this does not necessarily imply faster economic growth at all levels of revealed trade openness growth. In addition, author notes that well noticed Asian "miracle" referred to by the rapid economic growth of several Asian countries is not robustly due to increased openness to trade (Trejos and Barboza, 2015). To see more clearly how different the interpretation of the expected consequences of trade liberalization is, Table 1 summarizes the theoretical framework discussed and the results of various studies on the effect of trade liberalization on the economic growth of developing countries.

Table 1.First part of theoretical framework summary

Authors	Year	Title	Technique	Main findings
Bond et al.	2005	Economic takeoffs in a dynamic process of globalization	Dynamic general-equilibrium framework	Trade has positive and significant impact on production and growth in developed countries
Santos-Paulinio	1989-1999	The effects of trade liberalization on exports in selected developing countries	Export demand function approach	Open trade policy increases export share it is strongly beneficial for economic growth

Bolaky and Freund	1996-2000	Trade, regulations, and growth	Cross-country regression	Trade liberalization don´t have any important impact on growth if there are various protectionist restrictions.
Rodriguez and Rodrik,	1980-1994	Trade policy and economic growth	Research of partial Association	There is not strong negative relationship between trade barriers and economic growth
Santos-Paulinio	1989-1999	The effects of trade liberalization on imports in selected developing countries	Dynamic panel data techniques	Open trade policy impact is positive only on certain level of import shear in total GDP
Dierk Herzer	1960-2003	Cross-country heterogeneity and the trade-income relationship	Heterogeneous panel cointegration techniques	Trade openness is positive for developed countries and on average negative for developing ones.
Zahonogo	1980-2012	Trade and economic growth in developing countries: Evidence from sub-Saharan Africa	Dynamic growth model	Trade liberalization has significant positive effect on developing countries economic growth till it reaches a certain level
Kim and Lin	1960-2000	Trade and Growth at Different Stages of Economic Development	Threshold regressions approach	trade has significant impact on developed countries economic growth, but effect for low-income economies is comparably negative
Ulaşan	1960-2000	Trade openness and economic growth: panel evidence	Ordinary least square model	Trade are relevant to growth but this does not imply faster economic growth at all levels of revealed trade openness growth.
Rani and Kumar	1993 to 2015	Panel Data Analysis of Financial Development, Trade Openness, and Economic Growth:	Panel cointegration technique.	Trade openness has a positive impact on economic growth in developing countries while FDI inflow has a negative impact in these nations.

Global trade and income inequality

The impact of liberal trade is controversial not only on the economic growth of developing countries but also on the aggravation of inequality inside between developing countries. As an example, from 1988 to 2013, average global income increased by 24%, and global poverty ratio in the same period declined from 35% to 10.7%, whereas bottom 40 percent of the world's population examined 50% increase in income (Revenga and Gonzalez, 2017). On the other hand, it should be noted that although, many developing countries achieved high growth after trade policy changes, observations have shown that for the most parts of the developing countries poverty reduction were not accompanied with the economic achievements (Salimi, Akhoondzadeh and Arsalanbod, 2014, Tabassum and Majeed, 2008). About open trade effect on inequality, Ravallion, 2004, argues that trade liberalization is very likely to lower poverty in developing countries, but only if one accepts the view that trade does not affect inequality but fosters economic growth (Ravallion, 2005). Barro, 2000, suggests that inequality is a barrier to economic growth, but this assertion is more valid for developing countries, as developed countries are not hampered by inequality within the country. Specifically, growth tends to fall with greater inequality when per capita GDP is below 1985 U.S. dollars and to rise with inequality when per capita GDP is above $2000 (Barro, 2000). Çelik & Basdas, 2010, concluded that sustainable economic growth is necessary, but not sufficient in a globalized world. To ensure social welfare, which is a necessary condition for long-term success, social justice and equality must be achieved and maintained (Çelik & Basdas, 2010, p. 359). Therefore, we consider that for more complete reasoning it is important to determine the real link between trade and economic growth in parallel with the changes in between and within country inequality.

Trade and inequality across developed and developing countries

For defining the utility of trade liberalization for developing countries, it is important to understand how much, poor people from developing countries gain from trade openness. Inequality between rich (developed) countries and poor (developing) countries has been a contentious issue for many decades and international trade was believed to play an important role in influencing this inequality (Urata and Narjok, 2017). The reason of expected impact of trade liberalization on growing inequality in developing countries has several important underpinnings. Harvey et al., 2010, suggests that since in developing countries, about 60% of export earnings come from primary goods and for more than 40 developed countries, the production of three or less goods include almost the entire profit from exports. The countries

with this kind of economic formation can be easily trapped into the world, since developing countries export primary products such as natural resources to developed countries, while developing countries import industrial products from developed countries, because the difference between the prices of these two types of products is very large, it is not difficult to guess which economies will get richer (Harvey et al., 2010). The sceptical attitude towards the growth of prosperity in developing countries is also due to the view that global market can jeopardize small industries. As international manufacturers can produce in large factories and import such products to developing countries where economies and production are weaker, therefore that kind of high competition may be disastrous for underdeveloped domestic production (Aradhyula, Rahman and Seenivasan, 2007).

Trade and inequality growth inside developing countries

The opinion that trade liberalization is followed as economic growth as income inequality within and between countries is not new. The fact that many developing countries have achieved high growth rates in different periods, but in this period poverty has not reduced significantly due to increasing income inequality needs relevant attention. The studies about within country inequality suggests different results and views about this topic. Estimate model observed cross-sectional patterns of wages, employment, and export status across firms in Brazil show that with opening the closed economy to trade raising wage inequality by around 20 percent (Helpman et al., 2017). On the other hand, micro-level data analysed the impact of trade reform on Mexican wages and employment shows that trade reform has increased wage inequality. Since, after the Mexican government cut tariffs and covered import licenses by more than 50% from 1986 to 1990, wage dispersion has increased in both the non-traditional sector and in much higher quality, tradable sector (Feliciano, 2001).

The effect of trade liberalization on deepening inequality between countries is also interestingly presented in terms of the spread of technological progress. Technological progress and open trade policy are widely regarded as two of the main drivers of recent economic growth. Regarding to this, some authors suggests that one of the mine reasons why trade can deepen inequality is not trade itself, but technological progress spread through trade, since innovation tend to increase the relative demand for skills and education (Jaumotte, Lall and Papageorgiou, 2013, Aradhyula, Rahman and Seenivasan, 2007). In favour of previous argument, theory of product cycle developed by Zhu, 2004, suggests that innovative goods use relatively more skilled labor, hence technological obsolescence gives experienced workers an advantage. In particular, developing countries have less R&D and consequently technological

progress mainly extends from developed countries. Since developed countries are the inventors of most innovations, high-tech manufacturing after trade liberalization will be the main driving force for developed countries and low-skilled manufacturing, or old technology for developing countries. And because high-tech goods are much more expensive than basic consumer goods, such a technological distribution may further deepen inequality between developed and developing countries in terms of technological "progress" (Zhu, 2004)

On the other hand, there are studies that address the different causes of inequality and, suggest that trade may in turn reduce inequality within the country. The study using a newly compiled panel of 51 countries over a 23-year period from 1981 to 2003 support the view that technological progress may have greater impact in county inequality than trade. A study of five quintile populations to expose the effects of open market policy, trade, and technological progress on inequality suggests that export growth is associated with an increase in the revenue share of the last four quintiles and a decrease in the share of the richest quintile. In contrast, it has been shown that financial globalization and technological progress mainly benefit the wealthy 20 percent of the population. More specifically, increasing one standard deviation of the export-to-GDP ratio from its average value would reduce inequality by about 3.4 percent. Similarly, reducing one standard deviation of tariffs will reduce inequality by 2.6 percent, while increasing one standard deviation of domestic standard foreign investment may increase inequality by 2.9 percent (Jaumotte, Lall and Papageorgiou, 2013). Bosmans et al., also used five quantiles to measure inequality in their study, but differ from previous study the authors focused alternative absolute and intermediate inequality views. Research of average yearly growth in GDP per capita between 1980 and 2009 for each of the five quintiles, showed that in a period, bottom quantile growth was 8.8%, while it was 1.6% for the top one. Which means that inequality decreased in period, but differ from relative inequality, in absolute terms income per capita in the top quintile increased by $431 per year, while for the bottom quintile growth was $192 per year. Accordingly, results showed considerable deepening of the absolute income gap and this is true in 214 out of the total of 216 Lorenz comparable pairs of income distributions (Bosmans et al., 2013). The sceptical attitude of the results of this study between the growth of trade and the aggravation of inequality between countries is also confirmed by the data of the World Bank. During the fast-growing period of global integration, some of the poorest economies, as we have already mentioned, grew rapidly, although many developing countries also experienced increased inequality within and outside their borders. Figure 4 shows global inequality changes from 1988 to 2013. According to data between country

inequality and Gini index is decrease but the rate of inequality within the country is growing at an increasing pace (World Bank, 2016).

Figure 4. Global inequality Between 1988-2013
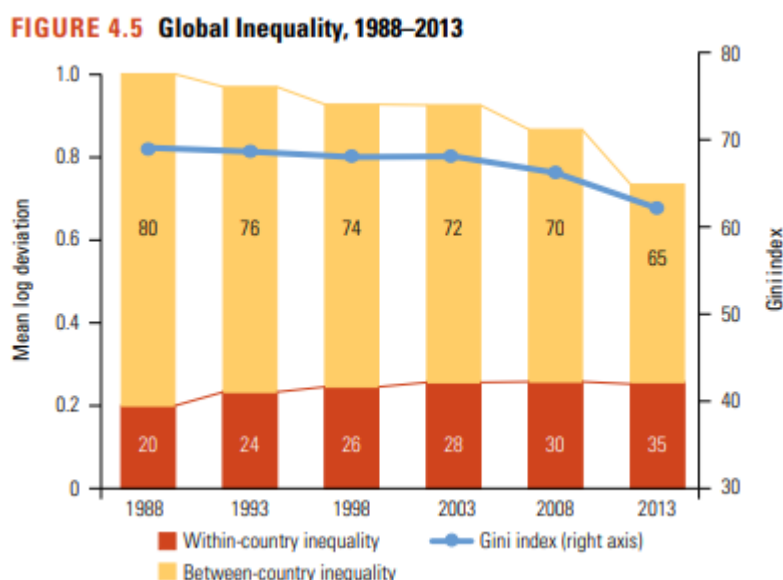
3.3 Trade liberalization effect on inequality between countries

A large body of research was made for study the correlation between country inequality changes, since this process can hinder potential benefits that one can get from trade. One of the advanced studies belongs Frankel and Romer, 1999. They used data for 150 countries to correct the endogenousness of trade, with instrumental variable techniques and using geographical indications in regression model. The study concluded that trade has a statistically significant impact on revenue distribution across the country (Frankel and Romer, 1999). David and Winters (2000) in a special study series with WTO, argued that trade liberalization is generally a positive contributor to poverty alleviation as it allows people to exploit their productive potential, assists economic growth, and curtails arbitrary policy interventions. On the other hand, they believe that most trade reforms create some losers and poverty may be exacerbated temporarily (David and Winters, 2000). Useing panel data for 104 countries from both developed and developing countries Figina and Gorg, 2011, estimated the relationship using fixed effects and random effects panel regression analysis. They conclude that trade liberalization significantly reduce inequality in both developed and developing countries, but increase in technology transfer significantly reduces inequality in the developing countries only whereas corruption is absence (Figina and Gorg, 2011). With this line, Muzammil et.al examined the impact of trade openness on the income inequality in the developing and

developed countries. via using panel data for 104 countries from both developed and developing countries and found that trade openness and ratio of the skilled to unskilled labor significantly reduce inequality in both developed and developing countries (Muzammil et.al, 2018). The macro lens researched by cross-country comparisons and aggregate time series data indicates that there is considerable variance in rates of poverty reduction at a given rate of expansion in trade volume (Ravallion, 2005). To examine the impact of trade on income, Aradhyula, et al., 2007, used a panel data on international trade and income level for 60 countries over a period of 1985-1994. Results of the study suggest that trade openness increases income inequality in the overall sample but when we split the sample in to two groups, trade increases inequality in developing countries but it reduces inequality in developed countries (Aradhyula, Rahman and Seenivasan, 2007). Harvey et al., 2010, examined time-series properties of primary commodity prices relative to manufactures and found that harve (Harvey et al., 2010). For easier evaluation Table 2, summarize discussed theoretical framework and the different research results about trade liberalization and inequality

Table 2.First part of theoretical framework summary

Authors	Year	Title	Technique	Main findings
Figinia and Görg	1980-2005	Does Foreign Direct Investment Affect Wage Inequality?	Fixed and random effects panel technique.	Trade liberalization reduces inequality in both developed and developing countries, but increase in technology transfer significantly reduces inequality in the developing countries only whereas corruption is absence.
Çelik & Basdas	1990-2005	How Does Globalization Affect Income Inequality?	Panel Data Analysis	Increase in FDI inflows improves income equality in both developed and developing countries, whereas, in miracle countries income distribution deteriorates
Helpman et al.,	1986–1995	Trade and inequality: From theory to estimation	Theoretical model to observe cross-sectional patterns	With opening the closed economy to trade raising wage inequality is expected to grow around 20 percent

Muzammil et.al	*1980-2014*	How Do the Technology Transfer and Trade Openness Affect Income inequality	fixed and random effects panel regression	Trade openness, expenditure on education and ratio of the skilled to unskilled labor significantly reduce inequality in both developed and developing countries.
Jaumotte, Lall, and Papageorgiou	1981 - 2003	Rising income inequality: technology, or trade and financial globalization?	Panel data analysis	Technological progress and spillovers have greater impact in county inequality than trade
Sakyi et al.,	1970– 2009	Trade openness, income levels, and economic growth:	heterogeneous panel cointegration techniques	Trade openness and income level in the long run has positive effect, thus suggesting that trade openness is both a cause and a consequence of the level of income.
Bosmans et al.,	1980- 2009	The Relativity of Decreasing Inequality Between Countries	Panel data analysis	Trade can be followed by considerable deepening of absolute income gap
Frankel and Romer	1999	Does trade cause growth?	Regression model	Trade has a statistically significant impact on revenue distribution across the country
Neagu et. al	2000- 2014	Inequality, Economic Growth and Trade Openness	Panel Data Analysis, random effect model	An increasing effect in income inequality was identified due to the increased trade openness
Aradhyula et al.,	1985-1994	Impact of international trade on income and income inequality	Panel data analysis	Trade openness increases income inequality in the overall sample, but separately trade increases inequality in developing countries and reduces inequality in developed countries

Research methodology

The aim of the empirical part is to investigate, firstly, the impact of trade liberalization on economic growth in developing countries, secondly, the impact of trade openness on the

expansion of inequality between developing countries, by showing contrast (if any) between protectionist and liberal developing countries in terms of economic growth and aggravation of inequality. As an indicator of trade liberalization, we will use the trade openness index, which includes the share of exports + imports in total GDP. To represent the economic growth of developing countries, we will use the GDP growth rate, and as an indicator of inequality between countries, we will use the Gini coefficients of the countries. As mentioned before, we have one full sample and two subsamples. The full sample consists of 10 developing countries classified by the World Bank, while two subsamples refer to five protective and five liberal countries. We collect annual country-level data about selected countries economic growth and inequality in the sample period from 2006 to 2019. All the data has been collected from World Bank database. For empirical research, we are going to use EViews software. The software is chosen because it is designed around the concept of objects, each with its own window, menu, usage procedure and corresponding data. One of the important features of the EViews used to create the model is the wide range of diagnostic tests that are calculated automatically (Brooks, 2014).

Objectives for empirical part

1. Present sample developing countries
2. Apply First generation Panel unit root tests on whole sample as well as two sub sample to check is the data is stationary and make sure that we don´t have cross-sectional dependence
3. Apply panel cointegration test to check if our satisfactory inference can be made on the long-run relation
4. Apply Hausman test to find out which Panel regression method should be more suitable (Fixed, Random)
5. To use panel data regression least square method (Fixed effect) to find trade openness effect on developing countries economic growth
6. To use panel data regression least square method (Random effect) to research trade openness effect on deepening cross country inequality

Country selection

As we have already mentioned we have chosen 10 developing countries, from which five are liberal and five are protective as it is given in Table 1. The main factors during country selection process were trade openness index, as well as countries were chosen to be as much similar in size as possible but there were some limitations, since Gini coefficient is not given for every country in our sample period. Therefore, we choose countries Firstly according to

Gini index accessibility and then we split the sample into liberal and protective countries according to their trade openness.

Table 3. Sample country list.

Liberal Developing Countries	Protectionist Developing Countries
Georgia	Ecuador
Moldova	Dominican Republic
Honduras	Uruguay
Panama	Armenia
Belarus	Costa Rica

Empirical methodology

In the following part of the methodology, we introduce first generation panel unit root tests, secondly we will introduce and briefly explain the importance of panel cointegration tests, thirdly we introduce our panel data regression models and in the final part, we will introduce our empirical findings.

Panel Unit Root Tests

Our empirical methodology we started with testing unit root, because for any time series it is crucial to know if the time series of variable are stationary or not. Starting with Unit root test according to its importance in panel cointegration techniques. Panel unit root test shows are variable stationarity and gives us information are the variables integrated in order or not. Panel unit root test, can be divided in two different types of test in terms of allowance of cross-sectional dependency. First generation panel unit root tests don´t allow for cross sectional dependency, whereas, second generation panel unit root test allows cross-sectional dependency. In our methodology, to check panel data stationarity we will use first generation panel unit root test as it was used by Çelik & Basdas (2010), and Herzer (2011). As our first generation test, we will use IPS test developed by Im et al. (2003) which has test the null hypothesis that a fraction of the series in the panel is non-stationary.

Panel Cointegration Tests

After applying unit root test, if our data will be integrated in order, we will apply Residual-based panel cointegration test statistics, developed by Pedroni (1999, 2004). Pedroni (1999) proposes four panel statistics and three group panel statistics to test the null hypothesis of no cointegration against the alternative hypothesis of cointegration. Respectively first four tests are panel n-statistic, panel rho-statistic, panel PP-statistic, panel ADF-statistic, and group panel statistics are tests are group rho-statistic, group PP-statistic, and group ADF-statistic. This method is an extension of traditional Engle and Granger two-step residual biased methods and compared to conventional cointegration tests, such as Engle and Granger (1987) and Johansen and Juselius, Pedroni test has higher power of estimation when numbers of data points are very less (Rani and Kumar, 2018) (Sehrawat & Giri, 2016a).

Panel Coefficient Estimation

To highlight the impact of open trade on economic growth and inequality we are applying a regression method using panel data. Panel data regression is a powerful way to control dependencies of unobserved, independent variables on a dependent variable, what is less possible in traditional linear regression. Our main driving force to use panel data regression is high probability that sample countries have different characteristics, which can effect on economic growth or inequality aggravation (Herzer, 2011., Santos-Paulinio, 2000). The model we are going to implement, was successfully implemented by Frankel and Romer (1999), Herzer (2011), Sakyi, Villaverde & Maza (2014) etc. for measuring the impact of trade openness on economic growth. The general formula for panel data regression is as follows

$$Y_{it} = \beta O + \beta 1 \cdot X_{it} + u_{it}$$

Where:

i - Denotes countries or entities; the cross-section dimension;

t - Denotes time; the time-series dimension;

β_O - is constant

β_i - is a regression coefficient

X_{it} – independent variable in time t and country i

u_{it} - is the error.

In most applications that use pane data, errors have the following form:

$u_{it} = \alpha_i + \varepsilon_{it}$ where:

α_i - is the error component specific to individual i;

ε_{it} - is the random component of error.

There are two main approaches, which can be used to analyse panel data: the fixed and random effects models.

The fixed effects model assumes that the characteristics of each individual unit can affect the dependent variable and that the effect of the time-invariant characteristics is not taken into account. In a fixed effects model regression equation can be written as follows:

$$Y_{it} = (\beta_0 + \theta_i \cdot D_i) + \beta \cdot X_{it} + \varepsilon_{it}$$

Where:

Y_{it} - is the dependent variable;

β_0 - is a constant;

θ_i - is a country-specific value;

D_i - is dummy variable for each country in the group;

β - is the parameter of independent variable;

X_{it} - is the independent variable;

ε_{it} - is the error.

Whereas, for random effect model the variation across countries is assumed as random and uncorrelated with predictor or independent variables (Neagu, et.al, 2016, p.-563). In a random effects model, the regression equation is the following:

$$Y_{it} = \beta O + \beta \cdot X_{it} + \varepsilon_{it}$$

Where:

$$\varepsilon_{it} = \lambda_{it} + \gamma_{it}$$

Then:

$$Y_{it} = \beta O + \beta \cdot X_{it} + \lambda_{it} + \gamma_{it}$$

Where:

Y_{it} - is the dependent variable;

β_o - is a constant;

β - is the parameter of independent variable;

X_{it} - is the independent variable;

ε_{it} - is the error term;

γ_{it} - is the common white noise error;

λ_{it} - is the specific error term.

To understand which model is more appropriate for our equation we applied commonly used Hausman test.

Hausman test

The Hausman test has an important contribution to understand if there is a correlation between the unique errors and the regressors in the regression model. The null hypothesis is that there is no correlation between the two. Respectively, a finding that p value is less than 5% means that, the two models are different enough to reject the null hypothesis what is in favor of the fixed effects model. If the Hausman test does not indicate a significant difference (p>0.05), the null hypothesis is accepted in the favour of the random effects model (Clark and Linzer, 2006).

Hausman test showed heterogeneous outcomes between two different equations. According to the results GDP growth and trade openness has correlation between unique error and regressor, since test´s p value is significantly below that 0.05. Therefore, we reject H_O that we have no correlation, therefore we reject random effect model in favour of Fixed effect model.

Respectively our first part of research will use panel data regression, fixed method for our whole sample and two subsamples – protective and liberal country groups with following equation:

$$GDPG_{it} = (\beta_0 + \theta_i \cdot D_i) + \beta \cdot TRADEOP_{it} + \varepsilon_{it}$$

Where:

$GDPG_{it}$ – is GDP growth for sample i countries in t time

t – 14 years (2006-2019)

β_0 - is a constant;

θ_i - is a country-specific value;

D_i - is dummy variable for each country in the group;

β - is the parameter of independent variable;

$TRADEOP_{it}$ – trade share in i sample countries GDP for period t

ε_{it} - is the error

1. i – 10 country (protective +liberal)
2. i – 5 country (protective)
3. i – 5 country (liberal)

Hausman test result for inequality equation (GINI index, Trade openness) had different outcome compared to first equation, since in the outcome p value is significantly higher than 0.05. According to outcome, we cannot reject H_o that means that we don´t have correlation between error term and regressor, respectively we will use random effect for this equation.

For second part of our research, will use panel data regression, random method for our whole sample and two subsamples that are protective and liberal countries, to check trade openness effect on cross-country inequality

$$GINI_{it} = \beta O + \beta 1 \cdot TRADEOP_{it} + \lambda_{it} + \gamma_{it}$$

Where;

$GINI_{it}$ – Gini index in sample i counties in time period t

t – 14 years (2006-2019)

β_o - is a constant;

β - is the parameter of independent variable;

$TRADEOP_{it}$ – trade share in i sample countries GDP for period t

ε_{it} - is the error term;

γ_{it} - is the common white noise error;

λ_{it} - is the specific error term

1. $i - 10$ country (protective +liberal)

2. $i - 5$ country (protective)

3. $i - 5$ country (liberal)

Data and Empirical Results

This paper consists of two different research. Firstly, we are researching trade liberalization effect on 10 developing countries economic growth during 14 years. For that, we are used one independent and one dependent variable. Independent variable is trade openness that depicted by export + import, as a percent of total GDP and dependent variable is sample countries GDP growth. In addition, we are applied the same research for two sub groups from which 5 is liberal 5 is protective. The aim of researching whole sample and two-sub group was to check if the trade liberalization benefit can be heterogeneous in different degree of trade liberalization. Secondly, we researched trade liberalization effect on cross-country inequality. For this research, we are using same country sample with the same two sub-groups and same time period. To find between county inequalities we used GINI coefficient, which lies between zero and one. Zero shows perfect equality and one shows the perfect inequality, accordingly as the GINI coefficient goes to zero, the income is distributed more evenly and equally. The index for each country is household and income based, covering the whole nation. To evaluate if trade openness level can effect inequality between developing countries we are using two sub-group, one contains only protective policy countries, which have relatively low trade share in their GDP and second contains only liberal policy countries, which have one of the highest shear of trade in their GDP over the sample period. We are research each sub-group separately and then comparing results, if the effect will differ greatly we can conclude that trade liberalization can exacerbate cross-country inequality.

We started our empirical methodology with testing unit root, because for most of the time series it is crucial to know if the time series of variable are stationary. See Table 3, Graphs 4, 5, 6 and Appendix 1. As can be seen, after applying first generation IPS unit root test on each variable we got following result; IPS test rejected null hypothesis (having unit root) for GDP growth at both a level and 1st difference. Whereas, for Gini index and trade openness index H_o were not rejected at a level, since P value were little bit higher than 5% in both cases. However, testing unit root at 1st level give us P value significantly low than 5%. Therefore, we can conclude that all the variables are integrated of order one.

Table 3. Outcomes from testing stationarity

Unit root test P value			
	GDP Growth rate	GINI index	Trade openness indicator
At Level	0.0000	0.0802	0.5262
At 1st Difference	0.0000	0.0000	0.0000

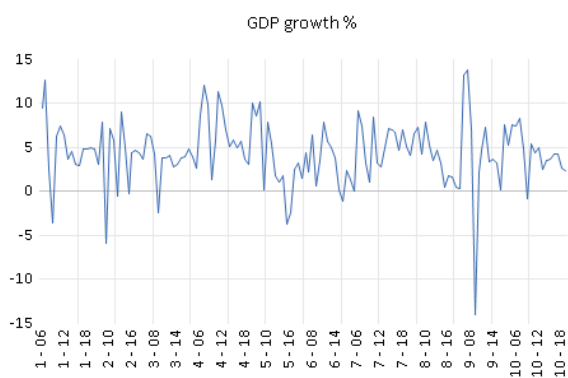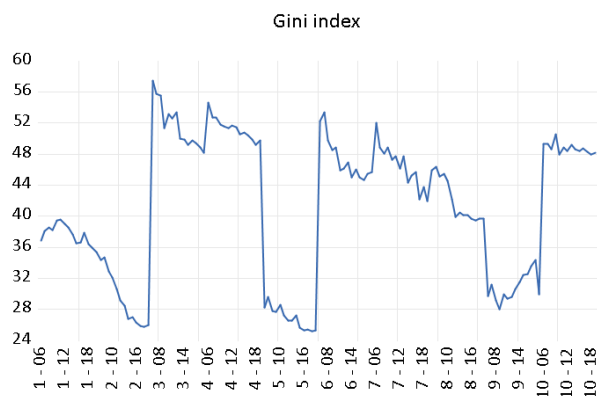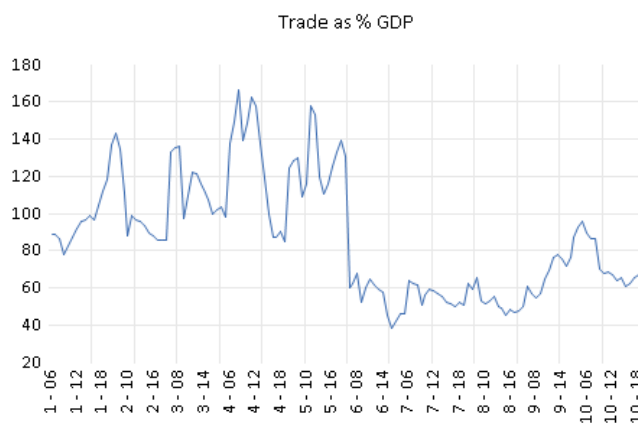Figure 5. GDP growth stationarity   Figure 6. GDP growth stationarity

Figure 7. Trade Openness indicator Stationarity

After ensuring the prerequisite for cointegration analysis, we conducted Pedroni (1999, 2004) panel cointegration test statistics to test the null hypothesis of no cointegration with seven different test at the same time. Testing trend and intercept on economic growth as well as inequality equations show that in every research at least 6 from 11 probability is less than 0.05. Which means that we have to reject null hypothesis of no cointegration. Detailed information in given in Appendix 3. After finding enough evidence of existence of long-run relationship, we tested our equations with Hausman test to find out which model (Fixed or Random) is more efficient for our final regression analysis. We tested trade liberalization effect on developing countries economic growth and found out that for this research Fixed effect model is more appropriate, since probability of the test turned out less than 0.05 (P=0.0133). Accordingly, we reject null hypothesis and made a decision in favour of fixed effect mode (see Appendix 6). Whereas for Second part of research we chose random effect model (trade openness and GINI index), since P value on the test was more than 0.05 (P=0.2224).

First panel least square fixed effect model, it revealed that trade openness has positive effect on developing countries economic growth, for whole sample of the countries, where p<0.05 with the R-squared of 0.159, what mean that about 16% of economic growth can be explained by trade openness. The result was same for two sub samples. For liberal country group p value was less than 5% with R-square 0.186, for protective p=0.0203, R-square 0.165. (See Appendix 8 -10, Table 4.) Which proves that the overall effect of trade liberalization on developing countries economic growth is positive. On the other hand, we can conclude that, according to our research trade liberalization effect on counters economic growth is not changing according to "free trade level" because we didn´t found any significant difference between liberal and protective group countries R-squares.

Table 4. Panel data regression, fixed method outcomes

	Whole sample	Liberal policy countries	Protective policy countries
P value	0.0011	0.0203	0.0052
R-square	**0.1591**	**0.1856**	**0.1645**
F statistics	2.4411	2.9178	2.5206

The results of second panel least square random effect model is as follows: examining trade openness effect on inequality for whole sample showed that, trade liberalization can

deepen inequality inside countries, since our estimation for the whole sample has p value less than 0.05, with R-square 0.218. Whereas researching two sub-group of liberal and protective country groups showed that trade liberalization have no or very little effect on aggravation between country-inequality, (See Appendix 10, Table 5). However, the study also revealed one unexpected result that the impact of trade on inequality was greater for countries with liberal trade than for countries with protective policy, although the differences are small, and this may be due to the different contexts of the countries in the group.

Table 4. Panel data regression, random method outcomes

	Whole sample	Liberal policy countries	Protective policy countries
P value	0.0000	0.0000	0.0000
R-square	**0.2178**	**0.2627**	**0.2398**
F statistics	38.421	24.223	21.4531

Conclusion

Trade liberalization has been the magical word used to define the recent episodes of growth and increase in global welfare. The urgency of trade policy liberalization arose not only because of its usefulness but also because of the doubts associated with it. Over time, many academics have analysed the issue of trade liberalization in the context of emerging economies alongside inequality and real economic growth. The increased doubts about the role of developing countries required need to determine how beneficial open international market can be for vulnerable economies. On the other hand, even if the significant benefits from open trade can be achieved, it is important to understand whether these benefits of trade liberalization contribute to overall well-being and not to the aggravation of inequality. In this paper, we have tried to understand whether trade liberalization has a positive effect on the economic growth of developing countries and what impact open trade policies can have on aggravating inequality between countries. We decided to combine the study of economic growth and inequality into one paper, as we believe that any benefits of trade liberalization could be significantly distorted if this process also led to aggravation of inequality. Accordingly, economic benefit assessments must be made in parallel with inequality variability assessments. The value of our research lies

in the fact that we used the latest data and conducted several tests to find the long-run relationship between variables without trend influence. Also important is the fact that most of the existing studies address inequality between developing and developed countries, while we conducted research on the effects of trade liberalization on inequality between developing countries, which allowed us to determine in more detail what outcomes may be associated with open trade for developing countries. According our study, which was based on panel data least square fixed and random effect models, trade openness has long run positive effect on developing countries economic growth, and this effect is more or less liner with increase of open trade. Whereas, trade liberalization have no or very limited impact of aggravation of inequality between countries even when the tendency of deepening inequality within the country is clearly noticeable.

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Summary

Mariam Kozashvili

TRADE LIBERALIZATION, ECONOMIC GROWTH, AND INEQUALITY IN DEVELOPING COUNTRIES

Final Master Thesis

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Nowadays, trade liberalization and its consequences is one of the most arguable event. Over time, many academics have analysed the issue of trade liberalization in the context of emerging economies alongside inequality and real economic growth, since inequality is considered as one of the biggest obstructive factor for countries' sustainable development. In this paper, we have tried to understand whether the benefits derived from trade liberalization serve the well-being of all. To do this, we first examined the effect of trade on the economic growth of developing countries, and then on the aggravation of inequality between developing countries. As a result of panel data least square fixed and random effect models, we found that trade liberalization have long run positive effect on developing countries economic growth, whereas we found no evidence that inequality between developing countries is aggravated by open trade, although the impact of liberal trade on exacerbating inequality within the country is evident.

Šiais laikais prekybos liberalizavimas ir jo pasekmės yra vienas iš labiausiai ginčytinų įvykių. Laikui bėgant daugelis akademikų nagrinėjo prekybos liberalizavimo klausimą besiformuojančios ekonomikos šalių kontekste kartu su nelygybe ir realiu ekonomikos augimu, nes nelygybė laikoma vienu didžiausių kliūčių šalių tvariam vystymuisi. Šiame darbe bandėme suprasti, ar prekybos liberalizavimo nauda pasitarnauja visų gerovei. Norėdami tai padaryti, pirmiausia išnagrinėjome prekybos poveikį besivystančių šalių ekonomikos augimui, o vėliau – nelygybės tarp besivystančių šalių didėjimui. Taikant skydinių duomenų mažiausių kvadratų fiksuoto ir atsitiktinio efekto modelius, mes nustatėme, kad prekybos liberalizavimas ilgą laiką turėjo teigiamą poveikį besivystančių šalių ekonomikos augimui, o neradome jokių įrodymų, kad atvira prekyba didina besivystančių šalių nelygybę, nors akivaizdu, kad liberali prekyba didina nelygybę šalyje.

Appendix 1

Table 1. ISP Unit root test for GDP growth for whole sample at Level

Null Hypothesis: Unit root (individual unit root process)
Series: GDP_GROWTH__
Date: 06/02/22 Time: 14:08
Sample: 2006 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 2
Total number of observations: 119
Cross-sections included: 10

Method	Statistic	Prob.**
Im, Pesaran and Shin W-stat	-8.35599	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate ADF test results

Cross section	t-Stat	Prob.	E(t)	E(Var)	Lag	Max Lag	Obs
1	-7.9549	0.0000	-1.494	1.157	1	2	12
2	-4.9683	0.0026	-1.494	1.157	1	2	12
3	-4.7435	0.0044	-1.333	1.352	2	2	11
4	-3.4635	0.0297	-1.494	1.157	1	2	12
5	-2.3413	0.1747	-1.510	0.981	0	2	13
6	-2.2403	0.2027	-1.510	0.981	0	2	13
7	-3.5965	0.0222	-1.510	0.981	0	2	13
8	0.1166	0.9509	-1.333	1.352	2	2	11
9	-5.2034	0.0023	-1.333	1.352	2	2	11
10	-8.6827	0.0000	-1.333	1.352	2	2	11
Average	-4.3078		-1.434	1.183			

Table 2. ISP Unit root test for GDP growth for whole sample at 1st difference

Null Hypothesis: Unit root (individual unit root process)
Series: D(GDP_GROWTH__)
Date: 06/02/22 Time: 14:10
Sample: 2006 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Total number of observations: 116
Cross-sections included: 10

Method	Statistic	Prob.**
Im, Pesaran and Shin W-stat	-10.8195	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate ADF test results

Cross section	t-Stat	Prob.	E(t)	E(Var)	Lag	Max Lag	Obs
1	-5.2778	0.0020	-1.491	1.206	1	1	11
2	-6.6837	0.0003	-1.491	1.206	1	1	11
3	-4.3164	0.0073	-1.508	1.011	0	1	12
4	-5.0452	0.0029	-1.491	1.206	1	1	11
5	-5.1680	0.0019	-1.508	1.011	0	1	12
6	-4.7133	0.0039	-1.508	1.011	0	1	12
7	-4.4402	0.0060	-1.508	1.011	0	1	12
8	-6.4952	0.0004	-1.491	1.206	1	1	11
9	-4.0789	0.0107	-1.508	1.011	0	1	12
10	-4.4947	0.0055	-1.508	1.011	0	1	12
Average	-5.0714		-1.501	1.089			

Appendix 2

Table 3. ISP Unit root test for Gini coefficient for whole sample at Level

```
Null Hypothesis: Unit root (individual unit root process)
Series: GINI_INDEX
Date: 06/02/22  Time: 14:13
Sample: 2006 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 2
Total number of observations: 124
Cross-sections included: 10
```

Method	Statistic	Prob.**
Im, Pesaran and Shin W-stat	-1.40386	0.0802

** Probabilities are computed assuming asympotic normality

Intermediate ADF test results

Cross section	t-Stat	Prob.	E(t)	E(Var)	Lag	Max Lag	Obs
1	-1.0238	0.7109	-1.510	0.981	0	2	13
2	-1.5657	0.4707	-1.510	0.981	0	2	13
3	-1.8116	0.3590	-1.510	0.981	0	2	13
4	-2.8256	0.0816	-1.510	0.981	0	2	13
5	-0.4746	0.8619	-1.333	1.352	2	2	11
6	-5.3899	0.0017	-1.333	1.352	2	2	11
7	0.6624	0.9840	-1.333	1.352	2	2	11
8	-1.1516	0.6604	-1.510	0.981	0	2	13
9	-1.7750	0.3748	-1.510	0.981	0	2	13
10	-3.8530	0.0142	-1.510	0.981	0	2	13
Average	-1.9208		-1.457	1.093			

Table 4. ISP Unit root test for Gini coefficient for whole sample at 1st difference

```
Null Hypothesis: Unit root (individual unit root process)
Series: D(GINI_INDEX)
Date: 06/02/22  Time: 14:15
Sample: 2006 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Total number of observations: 118
Cross-sections included: 10
```

Method	Statistic	Prob.**
Im, Pesaran and Shin W-stat	-10.6505	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate ADF test results

Cross section	t-Stat	Prob.	E(t)	E(Var)	Lag	Max Lag	Obs
1	-3.2739	0.0405	-1.508	1.011	0	1	12
2	-3.4129	0.0323	-1.508	1.011	0	1	12
3	-5.4264	0.0013	-1.508	1.011	0	1	12
4	-5.6132	0.0010	-1.508	1.011	0	1	12
5	-5.8697	0.0009	-1.491	1.206	1	1	11
6	-4.7638	0.0036	-1.508	1.011	0	1	12
7	-7.2018	0.0002	-1.491	1.206	1	1	11
8	-3.0060	0.0627	-1.508	1.011	0	1	12
9	-2.7425	0.0955	-1.508	1.011	0	1	12
10	-8.2428	0.0000	-1.508	1.011	0	1	12
Average	-4.9553		-1.505	1.050			

Appendix 3

Table 5. Cointegration, Pedroni (1999, 2004) for GDP growth

```
Pedroni Residual Cointegration Test
Series: GDP_GROWTH__ TRADE_AS___GDP
Date: 06/02/22  Time: 17:56
Sample: 2006 2019
Included observations: 140
Cross-sections included: 10
Null Hypothesis: No cointegration
Trend assumption: Deterministic intercept and trend
Automatic lag length selection based on SIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel
```

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-1.804869	0.9645	-3.026856	0.9988
Panel rho-Statistic	-0.061673	0.4754	-0.269755	0.3937
Panel PP-Statistic	-8.316113	0.0000	-8.702682	0.0000
Panel ADF-Statistic	-6.208243	0.0000	-6.280720	0.0000

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	1.298671	0.9030
Group PP-Statistic	-9.942039	0.0000
Group ADF-Statistic	-7.526865	0.0000

Cross section specific results

Phillips-Peron results (non-parametric)

Table 6. Cointegration dependence, Pedroni (1999, 2004) for GINI coefficient

```
Pedroni Residual Cointegration Test
Series: GINI_INDEX TRADE_AS___GDP
Date: 06/02/22  Time: 17:58
Sample: 2006 2019
Included observations: 140
Cross-sections included: 10
Null Hypothesis: No cointegration
Trend assumption: Deterministic intercept and trend
Automatic lag length selection based on SIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel
```

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	3.091104	0.0010	2.310815	0.0104
Panel rho-Statistic	-0.571309	0.2839	-0.771754	0.2201
Panel PP-Statistic	-3.690863	0.0001	-4.403022	0.0000
Panel ADF-Statistic	-3.602495	0.0002	-4.124690	0.0000

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	0.405025	0.6573
Group PP-Statistic	-7.235050	0.0000
Group ADF-Statistic	-5.694826	0.0000

Cross section specific results

Phillips-Peron results (non-parametric)

Appendix 4

Table 6. Cointegration, Pedroni (1999, 2004) GDP growth, protective countries

```
Pedroni Residual Cointegration Test
Series: GDP_GROWTH__ TRADE_AS__GDP
Date: 06/02/22   Time: 17:52
Sample: 2006 2019
Included observations: 70
Cross-sections included: 5
Null Hypothesis: No cointegration
Trend assumption: Deterministic intercept and trend
Automatic lag length selection based on SIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel
```

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-1.306405	0.9043	-2.432039	0.9925
Panel rho-Statistic	0.416057	0.6613	0.153294	0.5609
Panel PP-Statistic	-3.841528	0.0001	-4.722385	0.0000
Panel ADF-Statistic	-3.374605	0.0004	-3.940485	0.0000

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	0.827126	0.7959
Group PP-Statistic	-4.700439	0.0000
Group ADF-Statistic	-4.050383	0.0000

Cross section specific results

Phillips-Peron results (non-parametric)

Table 7. Cointegration, Pedroni (1999, 2004) GINI , protective countries

```
Pedroni Residual Cointegration Test
Series: GINI_INDEX TRADE_AS__GDP
Date: 06/02/22   Time: 17:54
Sample: 2006 2019
Included observations: 70
Cross-sections included: 5
Null Hypothesis: No cointegration
Trend assumption: Deterministic intercept and trend
Automatic lag length selection based on SIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel
```

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	2.048219	0.0203	1.253228	0.1051
Panel rho-Statistic	-0.337746	0.3678	-0.408246	0.3415
Panel PP-Statistic	-2.559522	0.0052	-2.807137	0.0025
Panel ADF-Statistic	-2.645078	0.0041	-2.910204	0.0018

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	0.217461	0.5861
Group PP-Statistic	-5.515874	0.0000
Group ADF-Statistic	-4.785177	0.0000

Cross section specific results

Phillips-Peron results (non-parametric)

Appendix 5

Table 8. Cointegration, Pedroni (1999, 2004) GDP growth , liberal countries

Pedroni Residual Cointegration Test
Series: GDP_GROWTH__ TRADE_AS__GDP
Date: 06/02/22 Time: 17:49
Sample: 2006 2019
Included observations: 70
Cross-sections included: 5
Null Hypothesis: No cointegration
Trend assumption: Deterministic intercept and trend
Automatic lag length selection based on SIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-1.243775	0.8932	-1.710951	0.9565
Panel rho-Statistic	-0.538168	0.2952	-0.697095	0.2429
Panel PP-Statistic	-8.399514	0.0000	-8.459063	0.0000
Panel ADF-Statistic	-6.230262	0.0000	-5.627703	0.0000

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	1.009472	0.8436
Group PP-Statistic	-9.359728	0.0000
Group ADF-Statistic	-6.594213	0.0000

Cross section specific results

Phillips-Peron results (non-parametric)

Table 9. Cointegration, Pedroni (1999, 2004) GINI , liberal countries

Pedroni Residual Cointegration Test
Series: GINI_INDEX TRADE_AS__GDP
Date: 06/02/22 Time: 17:36
Sample: 2006 2019
Included observations: 70
Cross-sections included: 5
Null Hypothesis: No cointegration
Trend assumption: Deterministic intercept and trend
Automatic lag length selection based on SIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	2.497542	0.0063	2.074754	0.0190
Panel rho-Statistic	-0.554138	0.2897	-0.704839	0.2405
Panel PP-Statistic	-2.723561	0.0032	-3.468348	0.0003
Panel ADF-Statistic	-2.300721	0.0107	-2.934546	0.0017

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	0.355331	0.6388
Group PP-Statistic	-4.716032	0.0000
Group ADF-Statistic	-3.268523	0.0005

Cross section specific results

Phillips-Peron results (non-parametric)

Appendix 6

Table 7. Hausman test, panel data least square for economic growth research

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.127956	1	0.0133

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
TRADE_AS___GDP	0.067382	0.025618	0.000285	0.0133

Cross-section random effects test equation:
Dependent Variable: GDP_GROWTH__
Method: Panel Least Squares
Date: 06/02/22   Time: 23:29
Sample: 2006 2019
Periods included: 14
Cross-sections included: 10
Total panel (balanced) observations: 140

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.545234	1.779004	-0.868595	0.3867
TRADE_AS___GDP	0.067382	0.020139	3.345845	0.0011

Table 8. Hausman test, panel data least square for inequality research

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.488960	1	0.2224

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
TRADE_AS___GDP	0.074506	0.072963	0.000002	0.2224

Cross-section random effects test equation:
Dependent Variable: GINI_INDEX
Method: Panel Least Squares
Date: 06/02/22   Time: 23:34
Sample: 2006 2019
Periods included: 14
Cross-sections included: 10
Total panel (balanced) observations: 140

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	34.79890	1.043972	33.33316	0.0000
TRADE_AS___GDP	0.074506	0.011818	6.304380	0.0000

Effects Specification

Appendix 7

Table 9. Panel data least square fixed effect method, whole sample

```
Dependent Variable: GDP_GROWTH__
Method: Panel Least Squares
Date: 06/03/22   Time: 13:45
Sample: 2006 2019
Periods included: 14
Cross-sections included: 10
Total panel (balanced) observations: 140
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRADE_AS___GDP	0.067382	0.020139	3.345845	0.0011
C	-1.545234	1.779004	-0.868595	0.3867

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.159126	Mean dependent var	4.325198
Adjusted R-squared	0.093942	S.D. dependent var	3.654432
S.E. of regression	3.478548	Akaike info criterion	5.406420
Sum squared resid	1560.938	Schwarz criterion	5.637549
Log likelihood	-367.4494	Hannan-Quinn criter.	5.500343
F-statistic	2.441180	Durbin-Watson stat	1.662462
Prob(F-statistic)	0.010616		

Table 10. Panel data least square fixed effect method, Liberal countries

```
Dependent Variable: GDP_GROWTH__
Method: Panel Least Squares
Date: 06/03/22   Time: 12:16
Sample: 2006 2019
Periods included: 14
Cross-sections included: 5
Total panel (balanced) observations: 70
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRADE_AS__GDP	0.052030	0.021868	2.379225	0.0203
C	-1.392255	2.505521	-0.555675	0.5804

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.185636	Mean dependent var	4.488792
Adjusted R-squared	0.122013	S.D. dependent var	3.656325
S.E. of regression	3.426010	Akaike info criterion	5.382486
Sum squared resid	751.2030	Schwarz criterion	5.575214
Log likelihood	-182.3870	Hannan-Quinn criter.	5.459040
F-statistic	2.917781	Durbin-Watson stat	1.779317
Prob(F-statistic)	0.019569		

Appendix 8

Table 11. Panel data least square fixed effect method, protective countries

Dependent Variable: GDP_GROWTH__
Method: Panel Least Squares
Date: 06/03/22   Time: 13:44
Sample: 2006 2019
Periods included: 14
Cross-sections included: 5
Total panel (balanced) observations: 70

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRADE_AS__GDP	0.138608	0.047908	2.893208	0.0052
C	-4.322619	2.961891	-1.459412	0.1493

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.164522	Mean dependent var	4.161603
Adjusted R-squared	0.099250	S.D. dependent var	3.671551
S.E. of regression	3.484590	Akaike info criterion	5.416394
Sum squared resid	777.1113	Schwarz criterion	5.609122
Log likelihood	-183.5738	Hannan-Quinn criter.	5.492948
F-statistic	2.520573	Durbin-Watson stat	1.543889
Prob(F-statistic)	0.038120		

Appendix 9

Table 12. Panel data least square random effect method, whole sample

```
Dependent Variable: GINI_INDEX
Method: Panel EGLS (Cross-section random effects)
Date: 06/02/22   Time: 23:38
Sample: 2006 2019
Periods included: 14
Cross-sections included: 10
Total panel (balanced) observations: 140
Swamy and Arora estimator of component variances
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRADE_AS___GDP	0.072963	0.011750	6.209442	0.0000
C	34.93338	3.256387	10.72765	0.0000

Effects Specification		S.D.	Rho
Cross-section random		9.760288	0.9581
Idiosyncratic random		2.041315	0.0419

Weighted Statistics			
R-squared	0.217780	Mean dependent var	2.304363
Adjusted R-squared	0.212112	S.D. dependent var	2.303806
S.E. of regression	2.044928	Sum squared resid	577.0789
F-statistic	38.42103	Durbin-Watson stat	0.502366
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	-0.118647	Mean dependent var	41.29000
Sum squared resid	13209.61	Durbin-Watson stat	0.021946

Table 13. Panel data least square random effect method, liberal countries

```
Dependent Variable: GINI_INDEX
Method: Panel EGLS (Cross-section random effects)
Date: 06/03/22   Time: 00:06
Sample: 2006 2019
Periods included: 14
Cross-sections included: 5
Total panel (balanced) observations: 70
Swamy and Arora estimator of component variances
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRADE_AS__GDP	0.062387	0.012768	4.886254	0.0000
C	32.43677	6.134847	5.287299	0.0000

Effects Specification		S.D.	Rho
Cross-section random		13.32223	0.9779
Idiosyncratic random		2.001077	0.0221

Weighted Statistics			
R-squared	0.262656	Mean dependent var	1.583962
Adjusted R-squared	0.251813	S.D. dependent var	2.296790
S.E. of regression	1.986673	Sum squared resid	268.3872
F-statistic	24.22295	Durbin-Watson stat	0.385408
Prob(F-statistic)	0.000006		

Unweighted Statistics			
R-squared	0.030943	Mean dependent var	39.48857
Sum squared resid	7783.629	Durbin-Watson stat	0.013289

Appendix 10

Table 14. Panel data least square random effect method, liberal countries

Dependent Variable: GINI_INDEX
Method: Panel EGLS (Cross-section random effects)
Date: 06/02/22   Time: 23:54
Sample: 2006 2019
Periods included: 14
Cross-sections included: 5
Total panel (balanced) observations: 70
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRADE_AS__GDP	0.128643	0.027682	4.647131	0.0000
C	35.21713	3.759731	9.366928	0.0000

Effects Specification				
			S.D.	Rho
Cross-section random			7.485397	0.9322
Idiosyncratic random			2.018454	0.0678

Weighted Statistics				
R-squared	0.239825	Mean dependent var		3.097462
Adjusted R-squared	0.228646	S.D. dependent var		2.305853
S.E. of regression	2.025155	Sum squared resid		278.8852
F-statistic	21.45313	Durbin-Watson stat		0.718796
Prob(F-statistic)	0.000017			

Unweighted Statistics			
R-squared	-0.133571	Mean dependent var	43.09143
Sum squared resid	3765.807	Durbin-Watson stat	0.053232