分类号____________密级___

U.D.C

贸易自由化对经济发展的异质性的动态作用：中国道路与华盛顿共识的实证研究

Dynamic and Heterogeneous Impacts of Trade Liberalization on Economic Development: An Empirical Investigation for China's Approach and Washington Consensus Approach

学位申请人	**：**	**MEHMET AKIF GUNDOGDU**
学号	**：**	**115020104901**
学 科 专 业	**：**	**ECONOMICS**
研 究 方 向	**：**	**DEVELOPMENT ECONOMICS**
指 导 教 师	**：**	**TIANSHU CHU**
定 稿 时 间	**：**	**2021 年 06 月**

.

西南财经大学

学位论文原创性及知识产权声明

本人郑重声明：所呈交的学位论文，是本人在导师的指导下独立进行研究工作所取得的成果。除文中已经注明引用的内容外，本论文不含任何其他个人或集体已经发表或撰写过的作品成果。对本文的研究做出重要贡献的个人和集体，均已在文中以明确方式标明，因本学位论文引起的法律结果完全由本人承担。

本人同意在校攻读学位期间论文工作的知识产权单位属西南财经大学。本人完全了解西南财经大学有关保留、使用学位论文的规定，即学校有权保留并向国家有关部门或机构送交论文的复印件和电子版，允许论文被查阅和借阅。本人授权西南财经大学可以将本学位论文的全部或部分内容编入有关数据库进行检索，可以采用影印、缩印、数字化或其他复制手段保存和汇编本学位论文。

本学位论文属于

1、□保密，在___年解密后适用本授权书。

2、☑ 不保密

特此声明。

学位申请人：MEHMET AKIF GUNDOGDU

2021 年 06 月　02 日

摘要

在 1950 至 1970 年代期间，传统的进口替代战略走向失败。此后，许多发展中经济体将其战略转向由国际机构制定的市场导向型贸易自由化政策，即“华盛顿共识”。这是一种发展方案，迫使所有发展中国家遵守相同的贸易政策制度。与大多数发展中国家不同，通过贸易自由化，中国实现了惊人的增长和发展，而贸易是这一成功的关键因素。在不屈服于市场的情况下，中国将自身经济背景及时融入全球市场。近年来，土耳其和中国进行了贸易自由化改革，土耳其选择了华盛顿共识的自由化模式。然而，土耳其的经济增长并不显著。本文从四个方向研究了贸易与增长之间的关系。

第一，本文以中国和土耳其为研究对象，探讨了贸易自由化后贸易与 GDP 的关系。我们以中国 1978 至 2017 年和土耳其 1980 至 2017 年的进口、出口和 GDP 为变量，运用 VEC 模型进行实证分析。结果表明，贸易自由化后，出口推动了两国的 GDP 增长。此外，进口促进了中国的出口贸易，土耳其则相反。进口也促进了土耳其的经济增长。我们还利用 TIVA 分析，剖析了 2005 至 2016 年进出口的相互依赖性，从而衡量考虑到生产分散化的国际贸易。分析结果表明，中国国内市场在国际市场上的影响力越来越大，而土耳其没有重大变化。

第二，本文运用 VAR 和 VEC 模型并观察经济指标，研究了 1980 年至 2017 年实施华盛顿共识贸易改革的特定发展中国家的贸易和增长经验，从而得出了国际框架。分析表明，贸易自由化后，相较于其他发展中国家，中国在对外贸易和经济增长中获益更多。中国经济呈现出更平稳、高速增长的态势。此外，中国国内市场发展显著，并具有国际竞争力。

第三，本文运用 VEC 模型分析了 1998 年第一季度至 2018 年第三季度土耳其进口要素与 GDP 之间的关系，解释了土耳其和其他发展中国家从进口到增长的因果关系。结果表明，与中国相反，土耳其和其他发展中国家依赖于外国技术并缺乏工业技术赶超。

第四，本文通过对特定国家进行面板分析，研究了 2000 至 2015 年间 FDI 对国内增值出口的影响，从而判断 FDI 是否对国内市场生产力具有重要作用。结果表明，FDI 流入对国内增值出口有显著影响。此外，相较于其他发展中国家，中国从 FDI 中获益更多，FDI 对国内市场生产力和出口具有关键作用。

关键词语：华盛顿共识，北京共识，贸易自由化，中国，土耳其，发展中国家

Acknowledgements

First and foremost, I want to express my sincere gratitude to my advisor Prof. Tianshu Chu. I will carry appreciation deep down in my heart for her invaluable guidance and insightful mentoring. I was always inspired by her continuous support, motivation and compassion during my thesis research.

Second but not the least I want to thank Ministry of Education of the Republic of the Turkey. The fund and vision they offered me is the most important motivation in my PhD. I am honored to have this privilege, and at the same time it brings responsibility to my country and the world.

My mother, who is the most important person in my life, and my siblings, whom I see as my wealth, have my eternal gratitude and love. Their support and love are behind every good thing in my life.

Finally, I would like to thank my friends, my dear Pınar Acet and everyone supported me during the time.

Special thanks to Southwestern University of Finance and Economics (SWUFE), Research Institute of Economics and Management (RIEM) and teachers and staff of the RIEM and College of International Education (CIE) and my dear friend Dr. Maria Orlandic.

Abstract

After the failure of the traditional import substitution strategy in the 1950-1970s, many developing economies transformed toward a market-oriented trade liberalization strategy advocated by international institutions named as "Washington Consensus". Most developing countries, including Turkey, have adopted this consensus which is a development prescription suggesting all developing countries to follow the same trade policy regime. In contrast, China has integrated into the global market without surrendering to the Washington Consensus. Instead, China has experienced a novel path which is named "Beijing Consensus" by some scholars. Besides, China's marvelous economic development contrasted markedly with the unimpressive experience of many developing countries that adopted the Washington Consensus.

Multiple theories and numerous empirical researches suggest that trade liberalization contributes to economic development. Therefore, the exceptional economic growth of China may be associated with the trade liberalization approach. However, to my best knowledge, Washington Consensus and China's policies have not been examined together in terms of the trade-growth axis. The purpose of the current thesis is to explore whether the relationship between trade and growth differs by trade liberalization policy. To accomplish this overarching aim, my thesis addresses four questions. As such, the research stream has been divided into four phases to address each specific research question.

The first stream aims to explore how the relationship between trade and growth differed with different trade liberalization policy choices in China and Turkey. The reasons for selecting China and Turkey were that 1) these countries adopted the different type of liberalization. Turkey followed Washington Consensus type of trade liberalization while China preferred to develop different ‘Beijing Consensus’. 2) they carried out the trade liberalization reforms in close years (1978 and 1980, respectively), and 3) two middle income countries had close GDP per capita income levels in 2018. The imports, exports, and GDP data of China (1978 -2017) and Turkey (1980-2017) were used. VEC model was applied to investigate the relationship between trade and growth in both countries. Results revealed that exports promoted GDP growth in both countries while imports improved GDP growth only in Turkey. Furthermore, TIVA analysis was used to investigate whether trade liberalization strengthen the domestic market in terms of import and export dependency considering production fragmentation data in the years of 2005-2016. Results indicated that China's domestic market got stronger in the international market; however, there were no significant changes in Turkey.

The second stream focused on the relationship between trade and growth in China and thirteen developing countries following Washington consensus policies. The reason for including the other developing countries was to explore whether the associations between imports, export and GDP in Turkey, which differed from those in China, apply to other countries following the Washington Consensus. These countries were selected considering the following four criteria: 1) Middle income countries due to different stage of development may call for different of strategies of development. 2) Countries population were over 10 million in the year 2017 to avoid low population countries. 3) countries liberalizing trade. 4) Excluding countries such as Russia and Kazakhstan where most of their exports are made up of natural gas. The imports, exports, and GDP data of these countries from 1980 to 2017 were used. VAR and VEC models were applied to investigate the relationship between trade and growth in these countries. Results showed that exports promoted GDP growth in all countries while imports improved GDP growth only in the countries which adopted Washington Consensus Policies. This result was similar to the result obtained in the first stream. Besides, China appeared to benefit more from foreign trade among other developing countries and to have a stable and high growth trend.

Results of the first and second stream led two further investigations. The first was to explore whether imports played an essential role in GDP growth. Thus, the third stream examined the role of imports components in GDP growth in Turkey. Import components and GDP data from 1998Q1 to 2018Q3 were used. VEC model was conducted to analyze the data. Results showed that dependency on foreign technology and lacking catch up with industrial technology. The second was to explain domestic market productivity in China, Turkey and other developing countries. Therefore, by using panel analysis, the fourth stream investigated whether Foreign Direct Investment (FDI) had a critical role in Domestic Value-Added Exports in developing countries. FDI and Domestic Value-Added Exports data of all countries from 2005 to 2015 were used. Results showed that inflow FDI had a highly significant effect on Domestic Value-Added Exports. Besides, China benefited from FDI more than other developing countries, and FDI had a critical role in domestic market productivity and exports.

This study provides useful insights for policy and decision makers to implement development policies by considering the specific conditions of the countries for expected success as China achieved. Also, it provides empirical findings to stimulate more investigations on China's unique success in both empirical and theoretical perspective.

Keywords: Washington Consensus, Beijing Consensus, Trade Liberalization, China, Turkey, Developing Countries

Table of Contents

List of Tables

List of Figures

List of Abbreviations

ADF	: Augmented Dickey-Fuller
AIC	: Akaike Information Criterion
AR	: Auto Regressive
ARG	: Argentina
BC	: Beijing Consensus
BRA	: Brazil
CHN	: China
COL	: Colombia
DOM	: Dominican Republic
DVAEX	: Domestic Value-Added Content in Gross Exports
ECT	: Error Correction Term
ECU	: Ecuador
EU	: European Union
FDI	: Foreign Direct Investment
FX	: Real effective exchange rate index
G20	: The Group of Twenty
GATT	: General Agreement on Tariffs and Trade
GDP	: Gross Domestic Product
GRC	: Greece
GVC	: Global Value Chains
HQ	: Hannan Quinn
ICT	: Information and Communications Technology
IMF	: International Money Fund
IRF	: Impulse Response Function
LM	: Lagrange Multiplier
MEX	: Mexico
MYS	: Malaysia
OECD	: Organization for Economic Co-operation and Development
OLS	: Ordinary Least Squares

PER	: Peru
POL	: Poland
PP	: Philips Perron
PSC	: Monetary Sector Credit to Private Sector
R&D	: Research and Development
ROU	: Romania
SC	: Schwarz Information Criterion
TCMB	: Turkish Central Bank
THA	: Thailand
TIVA	: Trade in Value-Added
TR	: Tariff rate
TR	: Turkey
UK	: United Kingdom
USA	: United States of America
USD	: The United States Dollar
VA	: Value Added
VAR	: Vector Autoregressive Model
VEC	: Vector Error Correction Model
WC	: Washington Consensus
WTO	: World Trade Organization
YOS	: Average Total Years of Schooling for Adult Population

Chapter One: Introduction

It has been shown in the studies of many economists that open trade positively affects the growth of the countries (Helpman, 1991; Barro and Lee, 1994; Frankel and Romer, 1999; Wacziarg and Welch, 2008). Yet, numerous studies have shown that the success and benefits of trade openness have been different for each country. It is also argued that trade liberalization brings various problems, especially to developing economies while accelerating economic growth and development (Rodrik, 2007).

The relationship between foreign trade and economic growth has been one of the main focuses of economists since economics was considered a science. In the mercantilist era, the concept of economic development is evaluated through the stockpiling of precious metals. Foreign trade is shaped through export-oriented through this purpose. Classical economists have widened and advanced this perspective. Adam Smith's (1776) perspective offers that "absolute cost" based international division of labor promotes nation's economy. David Ricardo (1821) argues that there should be a criterion of expertise for each country, taking into account the "comparative costs", paying attention to the limited resources. International specialization based on comparative costs enables the country to experience economic growth as participation in foreign trade. "Absolute cost" based international division of labor promotes nation's economy.

There are many reasons for countries to enter into free trade agreements. The most important of these is to remove the trade barriers and provide export opportunities for promoting domestic production as a contribution to national income. Countries that cooperate with trade agreements create economies of scale for larger markets and thus gain competitive advantage. In addition, Elimination of trade barriers leads the strengthened economies due to international competition. As a result of this, consumption surplus decreases and the industry is encouraged by supporting production facilities.

By the Great Depression in 1929, protectionist economic policies were applied by moving away from free trade policies especially in industrialized countries. It led to a decrease in world trade and the spread of the crisis all over the world. After World War II, main focus was to regulate and strengthen the economies that were destroyed in wars and contribute to the development of world trade. In this context, the General Agreement on Tariffs and Trade (GATT) was signed (1947). GATT was a multilateral agreement that regulates international trade in terms of rights and responsibilities. Objectives were increasing the commercial and economic relations, full employment and efficient use of production resources in the world. After that, in 1995, World Trade Organization (WTO) which is the currently only global international organization dealing with the rules of trade between nations was founded. The aim is to make it possible for trade to flow as smoothly, as predictably and freely as possible.

After the failure of the traditional import substitution strategy implemented in the 1950-1970s, many countries applied reforms and trade liberalization policies advocated by international financial, trade and economic institutions named Washington Consensus (WC). In this respect, the 1980s - 1990s turned into a fast and volatile growth trend with the liberalization of trade in terms of countries and world economy. Trade liberalization has resulted in static gains among countries in the form of increased production, employment, consumption and thus increased output per worker. Washington Consensus was conceived as a development prescription, suggesting the development and reform policies for all developing countries to follow the same trade policy regime. Regardless level of development and industrial capacities of countries, WC offers a uniform and universal pattern by the minimizing government intervention. Thus, market will better achieve goals of growth and diversification of the export and production structure in favor of free entry and exit. With the effect of neoliberal policies and support of private sectors, some developing countries have achieved economic success after 1980s. This situation accelerated the implementation of the Washington Consensus policy offers by others. Yet, Washington Consensus policies have failed to achieve sustainable growth for developing countries. (Rodrik, 2007). On the other hand, China experienced stable and fast growth rate after trade liberalization reforms in 1978. China's approach to trade liberalization and other reforms differs from Washington Consensus policy suggestions, named "Beijing Consensus (BC)" by Ramo (2004). China's approach is stated in the report of the work of the Chinese government (2010) as:

> "we came to the following conclusions: We must continue to make use of both market mechanisms and macro-control, that is, at the same time as we keep our reforms oriented toward a market economy, let market forces play their basic role in allocating resources, and stimulate the market's vitality, we must make best use of the socialist system's advantages, which enable us to make decisions efficiently, organize effectively, and concentrate resources to accomplish large undertakings"(Report on the Work of the Government, 2010).

In summary, China's approach underlies the crucial role of the state in the economy opposite to Washington Consensus. The failure of the Washington Consensus policies in developing countries and stable economic development of China brought a discussion: Does China offer a more effective approach for other developing countries than the Washington Consensus? Ramo's characterization of China's approach as Beijing Consensus is also a reflection of this debate. Our aim in this study is to explore how the relationship between trade and growth differed with different trade liberalization policy, rather than being a part of this discussion. Yet, we believe that our empirical research will contribute to this discussion and inspire it to move in a new direction.

Multiple theories and numerous empirical researches suggest that trade liberalization contributes to economic development. Therefore, the exceptional economic growth of China may be associated with the trade liberalization approach. However, to my best knowledge, Washington Consensus and China's policies have not been examined together in terms of the trade-growth axis. The purpose of the current thesis is to explore whether the relationship between trade and growth differs by trade liberalization policy. To accomplish this overarching aim, my thesis addresses four questions. As such, the research stream has been divided into four phases to address each specific research question.

The first stream aims to explore how the relationship between trade and growth differed with different trade liberalization policy choices in China and Turkey. The reasons for selecting China and Turkey were: 1) These countries adopted the different type of liberalization. Turkey followed Washington Consensus type of trade liberalization while China preferred to develop different 'Beijing Consensus'. 2) They carried out the trade liberalization reforms in close years (1978 and 1980, respectively), and 3) They were two middle income countries that had close GDP per capita income levels in 2018. Besides, my doctorate education is funded by the Ministry of Education of the Turkey. As a mandatory requirement of this fund, my thesis research has to analyze China and Turkey together. The imports, exports, and GDP data of China (1978 -2017) and Turkey (1980-2017) were used. VEC model was applied to investigate the relationship between trade and growth in both countries. Results revealed that exports promoted GDP growth in both countries while imports improved GDP growth only in Turkey. Furthermore, TIVA analysis was used to investigate whether trade liberalization strengthen the domestic market in terms of import and export dependency considering production fragmentation data in the years of 2005-2016. Results indicated that China's domestic market got stronger in the international market; however, there were no significant changes in Turkey.

The second stream focused on the relationship between trade and growth in China and thirteen developing countries following Washington consensus policies. The reason for including the other developing countries was to explore whether the associations between imports, export and GDP in Turkey, which differed from those in China, apply to other countries following the Washington Consensus. These countries were selected considering the following four criteria: 1) Middle income countries due to different stage of development may call for different of strategies of development. 2) Countries population were over 10 million in the year 2017 to avoid low population countries. Low population countries have limited resources, not competitive domestic market and high degree of dependency to international trade. 3) Countries liberalizing trade. The reason was to observe dynamics relationship between trade and growth with high degree of participation to international trade. 4) Excluding countries such as Russia and Kazakhstan where most of their exports are made up of natural gas. Cuba is also excluded due to the long term and strict embargo by USA and majority of industrialized countries. The imports, exports, and GDP data of these countries from 1980 to 2017 were used. VAR and VEC models were applied to investigate the relationship between trade and growth in these countries. Results showed that exports promoted GDP growth in all countries while imports improved GDP growth only in the countries which adopted Washington Consensus Policies. This result was similar to the result obtained in the first stream. Besides, China appeared to benefit more from foreign trade among other developing countries and to have a stable and high growth trend.

Results of the first and second stream led two further investigations. The first was to explore whether imports played an essential role in GDP growth. Thus, the third stream examined the role of imports components in GDP growth in Turkey. Import components and GDP data from 1998Q1 to 2018Q3 were used. VEC model was conducted to analyze the data. Results showed that dependency on foreign technology and lacking catch up with industrial technology. The second was to explain domestic market productivity in China, Turkey and other developing countries. Therefore, by using panel analysis, the fourth stream investigated whether Foreign Direct Investment (FDI) had a critical role in Domestic Value-Added Exports in developing countries. FDI and Domestic Value-Added Exports data of all countries from 2005 to 2015 were used. Results showed that inflow FDI had a highly significant effect on Domestic Value-Added Exports. Besides, China benefited from FDI more than other developing countries, and FDI had a critical role in domestic market productivity and exports.

1.1. **Background of Foreign Trade and Economic Development**

In the mercantilist period where economic development means wealth, the relationship between economic development and foreign trade is to increase stock of precious metals owned by a country, even though its framework has not been drawn. According to this understanding, foreign trade is unique way to increase wealth as much as exports are more than imports. Afterwards, the perspective of mercantilist thought is extended by classical economists. Adam Smith (1776), in his book "Wealth of Nations'', argues that the international division of labor, which is based on "absolute cost" differences, will contribute to the nation's economy. David Ricardo (1821) suggests that there should be a criterion of expertise by drawing attention to the limitations of resources. This specialization should be determined by considering "comparative costs" for each country.

International specialization entails participation in foreign trade to expand the borders of a country's economic growth based on comparative costs.

Neoclassical foreign trade theory has adopted the opportunity cost approach, which includes other factors instead of labor cost, within the framework of Ricardo's approach. They argued that this was enough to stimulate foreign trade with the workforce. (Heller, 1972). The Heckscher-Ohlin theory has attributed the productivity difference to factor equipment. The basic claim of this approach is that trade leads to a tendency to equalize factor revenues between countries and the removal of internal monopolies (Ohlin, 1967). Thus, main factor of development was appointed by the comparative advantages' identification with the input endowment. The neoclassical analysis of the relationship between foreign trade and development contributes to countervail of input prices and equalization of development conditions by further expanding the Ricardian perspective. Then Samuelson demonstrates this equalization by drawing mathematical and geometric framework which is taken by the next theorists as a point of reference.

By the 50s the diversification and complexity of economics and trade has revealed the shortages and challenges of traditional theories. Increasing globalization has rapidly developed trade. In this respect, many economists attempted to describe in detail with theories and approaches towards the causal relations in economic growth and foreign trade. Two main approaches are framed by economists. One side is focused on the effect of growth on foreign trade from supply perspective another side see trade as a factor of economic growth from demand perspective.

Some economists such as Rybczynski (1955), Johnson (1958), Meir (1964) discuss constraining status of the constant supply factors in the traditional theory and offered dynamic approach. This dynamic approach of comparative advantages showed changes in capital accumulation factor' structure and quality, population growth, increased technology development and thus, productivity. These are the factors to lead economic growth. The aim was to reveal if growth process increased export quotations and/or decreased import demand by approximately the same rate (Johnson, 1958; Meir, 1964). The impact from economic growth to trade comes by combining production with the consumption effects.

1.1.2. Trade Liberalization

The assumption of trade liberalization is to remove trade restrictions in the concept of free trade. Since the classical economists, when the economy was seen and addressed as a science, theses have been carried out on the fact that the development of foreign trade will increase the mutual welfare of countries. Today, foreign trade theories are built on the foundations of these thesis. Elimination of economic inequalities, availability of goods and services by every country, spreading of technological development to the whole world and reaching the position of a factor that accelerates world welfare are among the many benefits of foreign trade. A reduction in world barriers to trade can accelerate growth, stimulate new forms of productivity-enhancing specialization, and lead to faster job creation and poverty reduction in the business world (World Bank, 2003).

After the failure of the traditional import substitution strategy implemented by many developing economies in the 1950-1970s, many countries transformed their strategies towards to reform programs and trade liberalization policy set developed and offered by international economic and financial institutions. In this respect, the 1980s - 1990s turned into a fast and volatile growth trend with the liberalization of trade in terms of countries and world economy. Trade liberalization has resulted in static gains among countries by increased production, consumption, employment, and thus rise output per worker, R&D expenditures and industrialization. In addition, financial liberalization turned into direct investments among the countries to boost economies supported by the increased in knowledge, competition and qualified workforce. Therefore, diversification in production line accelerated economic growth and welfare which aimed to be one of the first objective by World Bank at the time.

Trade liberalization as economic reform based on market process that implemented in various developing countries in the early 1980s and extended intensively in the 1990s, differed in terms of content and ownership for different countries. Shafaeddin (2005) examined reforming countries by dividing them into three groups. The first of these is a group of several East Asia countries that maintain their dynamic trade and industrial policies started by 1960s. Second group of countries, mostly from Africa, undergoing reform programs were international financial institutions recommendations. The last group consists of some Latin American countries that have been carrying out economic reforms started in the early 1980s, by pressure from international financial institutions. But these Latin countries intensified their reform processes in the 1990s, without necessarily being under the pressure of these institutions in any case. Content and philosophy of these reforms have been referenced since the early 1990s to policy recommendations advocated by international financial institutions named "Washington Consensus". It was conceived as a development prescription, forcing the development and reform policies by ignoring their development and industrial accumulation of all developing countries into a uniform and universal pattern. Along with trade liberalization, which meant that all industries and sectors would have same low or even zero tariff rates. These contracting macroeconomic policy proposals pushed developing countries to a position that would create a profound and sudden series of economic and social weaknesses (Shafaeddin, 2005).

The main purpose of the reform programs is to minimize the role of the state in decision-making on resource allocation, liberalize imports instead of import substitution foreign trade, and thus encourages the increase of exports. By the minimizing government intervention, market will better achieve goals of growth and diversification of the export and production structure in favor of free entry and exit. In this perspective, expanding investment is possible by allocating resources better and directing investment expenditures to more productive sectors. This new way of incentives cause diversification in production and growth by improving skills and technology by trade.

1.1.3. Washington Consensus

Washington Consensus is a model that includes development policy recommendations for all developing countries, especially Latin America, framed by Williamson (1990, 2000). It also describes common policies of international financial and economic institutions such as the IMF and the World Bank. It was first designed as 10 items and then expanded to make up for the deficiencies. These are financial discipline, prioritize public expenditures with high returns and better income distribution (health, education), tax reform (low marginal tax rates), Interest rate flexibility, competitive exchange rate, privatization, liberalization of imports, liberalization, direct foreign capital flows (investments), deregulation (eliminating economic barriers), protection of property rights. In summary, it can be outlined over four main principles. These; liberalization of trade in goods and services, free movement of capital on a global scale, free movement of immigration and labor, and less intervention of government in the economy.

Privatization, deregulation (deregulation) and trade liberalization emphasized by the Washington Consensus have been adopted by policy makers in post-socialist Eastern Europe and Latin America with high hope while it has been approached more cautiously in Africa and Asia. It was stated that market-centered reforms would complement the private and public sector of the economy. The role assigned to governments by the consensus was not beyond the provision of macroeconomic stability and education. However, the financial crises experienced by the developing countries in the late 1990s have led to the discussion of the limitations faced by fiscal policy. Fiscal discipline was one of the most fundamental policy due to large and continuous budget deficit of developing countries. According to this approach, these are the main source of macroeconomic instabilities such as inflation, balance of payments deficit and capital outflow. However, this policy did not prevent macroeconomic instabilities as expected. Later, fiscal flexibility has been demanded by most of the countries experiencing instability, for a variety of reasons, including fears of (financial) unsustainability, credit constraints, and compulsory savings. There has been a great pressure on international institutions to remove these restrictions with fundamental expectation of solutions around these problems (Perrotti, 2007).

With the neoliberal policies and support of public enterprises and private sectors, some developing countries reached economic success by the 1980s. This situation created attraction to the Washington Consensus policy proposals and brought more room for private sector in the economy in order to more stable growth in developing countries. However, Washington Consensus policies have resulted that not achieving more sustainable growth. As such, these policies were implemented very quickly and aggressively by excluding other necessary preparation to adopt these policies wisely. Therefore, austerity policies caused recession and led countries to be exposed to greater risks (Stiglitz, 2002). After the Washington Consensus failed one by one in what promised, it became clear that a more balanced view was needed. Multinational institutions have begun to rethink the conditions and debate brings in Washington Consensus "secondary generation reforms", "governance" and "improving the capability of the state" (Williamson, 2000). Policy offers of the Washington Consensus have been followed closely by many countries, did not bring success and economic stability and protection from the economic crisis in these countries. Another disappointing was the unemployment and poverty reduction (Stiglitz, 2002). Budget deficits caused to crisis again in many developing countries even though fiscal discipline and other reform proposals was followed strictly. The global financial crisis was last strike of sanctifying the market mechanism. It ended with a crisis which had high contagion effect and causing huge production losses in many parts of the world. So, it brought necessity to better understand and evaluate the complementarity relationship between the market and the state in the twenty-first century. As it was highlighted by World Bank named *Economic Growth in the 1990s: Learning from a Decade of Reform* that there is no consistency about which of the points emphasized by the Washington Consensus are working and which ones are not. It emphasizes policy diversity, selective and moderate reforms, and the necessity for experiences (World Bank, 2005). One of the most important inferences can be taken from the book is that the fundamental mistake of the Washington Consensus which formulates a universal development model and directs it to be implemented by ignoring the economic, political and social background of the countries. Book also summarizes the following implications as *Learning from a Decade of Reform.* First of them is an unforeseen depth and production failure in transition economies. Many countries transformed to market economy have still not reached production level of the 1990 for more than a decade. Second, although Sub-Saharan African countries have made significant reforms, they have failed in the development of the political and external environment and the flow of foreign aid. Thirdly, Latin America, East Asia, Russia and Turkey, which are frequent and devastating consequences of the financial crisis is concerned. Fourth, the development duration of Latin America is not long. Eventually, Argentina took initiative of the Latin American economic revolution, faced a crisis in 2002. These implications inference that countries that have internalized the policy proposals of the Washington Consensus are still sensitive to internal and external shocks. Also, sustainable growth process has not been caught and fragility against new crises continues because the financial balance cannot be established. Besides, China and India, which implemented unusual policies despite their reliance on market forces; rapid economic growth has taken place, with high trade protections, lack of privatization, extensive industrial policies, and far away of financial and fiscal policies throughout the 1990s. These two economies achieved to reach further of the Washington Consensus proposals. On the other hand, countries that actually implemented WC suggestions failed rather than being successful (Rodrik, 2006).

1.1.4. Beijing Consensus or China Model

As a unique success story, China has achieved to integrate its own economic background and global market in time without surrendering to market as Washington Consensus strongly suggest in the framework development policies. Zhang (2012:2) defines China as a “civilizational state” that has an extremely strong and extensive historical and cultural traditions in his book *The China Wave: Rise of A Civilizational State.* According to his book, Sumerian, ancient Egyptian, Greek and Roman civilizations are just a few of them that have risen but eventually fell. If these civilizations still existed and merged with a modern state in turn, they would become a civilizational state. At present, China is the only rising civilization state to become the longest civilization in the world with a colossal modern state. Reflecting the tension arising from the fusion of some traditions of an ancient civilization with the practices of a modern nation, as a civilizational state, China has at least eight features: i) a super-large population; ii) a very large territory; iii) super long traditions; iv) a super-rich culture; v) unique language; vi) unique politics; vii) a unique society and; viii) a unique economy (Zhang, 2012:3). Instead of adopting a completely foreign model, a civilization state takes advantage of the power of the foreign model while maintaining its original identity. It also has the ability to set their own standards that other countries may choose to imitate that described as “China Wave” in the book for the potential inspiration of China’s success. Especially, after the failure of the development policy framework (Washington Consensus) developed by western countries for developing countries (Rodrik, 2006), the Chinese experience began to be expressed more as an alternative development model in the world for developing countries. It will bring a horizontal order in which China and other countries will be equal to the West regarding to wealth and ideas. Such an unprecedented change in economic and political gravity will not only change human history but also change the world to the better direction (Zhang, 2012).

China's development model has similarities to the East Asian development model in terms of emphasizing a state-driven modernization process that adopted to Washington Consensus on some elements and ignoring others such as privatization, lesser government on economy, etc. (Lee et al., 2006). Rodrik (1996) revealed the slow-growth puzzle of Latin America, whose economies follow the Washington Consensus more closely when compared to East Asian economies. Although Latin America approved and tested all elements of the Consensus simultaneously, Korea and Taiwan adopted only some of them, such as macroeconomic stability, but continued microeconomic intervention. However, comparing to East Asian development model, China's development model has unique significance differences as well. China has adopted the Western model by choosing best matches to its unique characteristics in order to create own unique development model. To Zhang (2012), the Chinese model has eight features, among others: i) practical reasoning; ii) strong situation; iii) prioritize stability; iv) priority of people's livelihoods; v) gradual reform; vi) correct priorities and order; vii) a mixed economy and; viii) opening up to the outside world. Furthermore, political scientists have proposed the concepts of developmental or autonomous states (State plays a role in macroeconomic planning) while defining the growth experience of East Asia. However, these are powerful concepts due to demanding the state to have certain inherent qualities with the burden of having committed and visionary leaders. China's experience took a different approach that treats government as composed of rational individuals who need to be motivated to work for the mutual benefits of society. While China's implementation of the Washington Consensus is country specific, it contains a fundamental principle that others can learn from: namely, a voluntary pragmatism with a defined goal to improve the status quo (Yao, 2011).

The term of Beijing Consensus was first mentioned by Ramo in the paper named "The Beijing Consensus" in 2004. The main point of Ramo's article is the challenges of the China's economic growth to the principles in the Washington Consensus. Beijing Consensus is ideologically neutral and flexible in contrast to Washington Consensus strictness. It is shaped by experience and innovation based on current conditions. This pragmatic approach has provided benefits extremely well in Chinese development process as rapid growth and reducing poverty dramatically. "What is happening in China at the moment is not only a model for China, but has begun to remake the whole land scape of international development, economics, society and, by extension, politics"

(Ramo, 2004). China's integration into the world economy and its successful development at local and international level has enabled it to be seen as a stable development model by an increasing number of countries in the world. Despite the radical and strict rules of the Washington consensus, it has become an alternative development model for many middle-sized non-Western countries, as it is more flexible on reforms and considers country specific conditions (Halper, 2010).

1.2. Theoretical Framework

In this part, we examined theoretical literature related to our research. Growth-led Export, Export-led Growth, growth and trade causality and foreign direct investment and economic growth were reviewed to address the theoretical background on which our empirical research was based.

1.2.1. Effect of Growth on Foreign Trade from Supply Perspective: Growth-led Export

Growth-led export is expanded and deepened analysis of neoclassical theory under the new trade theory argued by economists such as Lancaster (1980), Krugman (1984), Helpman and Krugman (1985). Neoclassical growth models assume that technological change is exogenous and not affected by a country's trade policy. However, new growth models (endogenous growth models) assume that technological change is endogenous and mentions that technological change can be affected by the degree of trade openness of a country. Economists Södersten and Reed (1994) analyzed the types of growth dependency to the stock of divergent technological improvement and the growth factors. Their findings suggest that being wealthy relatively in labor through the exports a commodity containing provides a rise in production by labor endowment increase. This creates market opportunity and competitiveness for international trade and growth in domestic market (Bhagwati, 1978; Södersten and Reed, 1994).

Another analysis is conducted by Krugman and Obstfeld on the growth behaviors over open economy. Their work shows impacts the growth for a country in the international economy and backward effects. It is also shown how growth in partner countries reflects to the domestic economy in terms of factor intensity of exported and imported commodities, price dynamics and variations of the endowments stock by trade channels. Growth in the partner countries take advantage from host country's economy through the more export opportunities. At the same time, it is possible to characterize positive effects that encourage adjustment and modernization, as well as negative effects from new export markets caused by competition between economies. Likewise, growth in the country's economy may have beneficial effects by increasing export and import capacities. Likewise, increasing import and export capacities potentially bring beneficial effects in growth in the country's economy (Krugman and Obstfeld, 1992). In addition, Bhagwati (1988) has shown that an increase in GDP usually leads to a corresponding expansion in trade, unless the supply triggered by growth and the demand caused by that supply create an anti-trade bias. Kunst and Marin (1989) contributed to the growth-supported trade expansion hypothesis by providing empirical evidence of growth-based exports. Moreover, the product life cycle hypothesis, which Vernon (1966) put forward, has recently been discussed in terms of the growth relationship of international trade. Segerstrom, Anant and Dinopoulos (1990) draw on the North-South trade analysis product life cycle hypothesis, where research and development competition between firms determines the rate of product innovation in the North.

1.2.2. Effect of Foreign Trade on Growth from Demand Perspective: Export-led Growth

Analyzing trade as a factor of economic growth from demand perspective is based on multiplier mechanism from the conceptual framework and tools of Keynes which neoclassical framework is found insufficient. In this view, the multiplier brings opportunity to examine the frequency of fluctuations by export in economic growth and fluctuations in world economy. With the contributions of many economists such as Harrod (1933), Robinson (1937), Metzler (1949), Holzman (1976), it is improved for open economy activities, then referred as foreign trade multiplier (Marcy, 1960). Keynesian foreign trade multiplier defines the positive impacts of trade to domestic market and economy in the focus of imports and exports vibrations and thus contributions (Currie, 1983). A country's trade openness increases imports of goods and services, which includes the import of new technologies. Therefore, domestic technology improves and leads to more efficient productivity. Foreign trade multiplier theory creates "export-led growth" model in contemporary literature which is developed by many economists such as Beckerman (1962), Lamfalussy (1963), Balassa (1978).

The fundamentals of the export-based growth model show that the grow of exports has a strong influence to the host's economy growth in two-way. First, total exports, with an impact on the output level with the multiplier effect, contribute to the country's income. Second, the export level increases the foreign exchange inflow, which triggers the import of basic inputs in the production system. Considering the factors affecting exports, it can be said that the degree of international openness will increase the exports of a country in order to increase efficiency by result of competitiveness in local market. In addition, the embracing high technologies, management experiences in international markets causes exports to improve and catch-up international level. Importantly, encouraging exports provide sufficient capital inflow into domestic market to improve stock of capital. Then, improved production by new sources causes increase in exports and promotes economic growth (Chang, et al., 2005). Similar arguments are highlighted in the works of Lucas, Romer and Svensson. They developed a theory and some models in which the growth of developed countries used technology as the main factor that promoted productivity. Due to effects of technology spillover and external stimulation, international trade has potential to promote economic growth.

Although trade and economic growth axis is analyzed as the export approaches leading to export-led growth to growth-led export, significance of imports for exports and growth becomes inevitable. Increased imports can be considered more input factors in exports. It brings an opportunity of catching up technological changes and keep improving the domestic market productivity by imported intermediate goods or factors. Import of these intermediates provide the basis for the production of goods (Kotil and Konur, 2010). Also imports contribute to national financial well-being and economic growth by reducing production costs and increase the well-being of consumers. Yet, the impacts of imports on economy should be examined together with whether or not it supports export, production and national welfare. Because, common accepting in literature states imports have a unwanted impact on domestic economy based on the assumption that imports lead to unemployment by lowering a country's income. This accepting narrows the trade and growth analysis to focus relationship between exports and growth (Li, et al., 2010).

1.2.3. Foreign Trade and Growth Causality

Causality between foreign trade and growth literature have been examined mostly in terms of export-growth side. Because, the general understanding of macroeconomics is that imports are seen as an income leak that may lead to unemployment rather than economic growth as mentioned above. Causality studies give a wide variety of results about growth-trade relationship: export-growth causality, growth-export causality, bi-directional causality or no casual relation. Besides, there is no consensus on causality applied for all countries.

The majority of export and growth literature analyze the impact of export on growth or impact of growth on exports as supported by hypotheses of export-led growth and growth-led exports. Causality findings from this analysis bring advantages for policy makers to choose a strategy for development by linking policy to either channel domestic productivity to exports or adopt the domestic market to international opportunities (Temiz and Gökmen, 2010). Besides, policy strategies may change because each country has different economic integration to the world.

There are limited studies in the literature that focus the causality between imports and growth by considering the possible effects of imports on growth. Yet, it is possible import increase the efficiency in domestic production and enable the development of the country's industrial structure. In general, developed countries keep the capital and technology advantages. On the other hand, developing countries have lack of technology and capital yet having labor and natural resources advantages. For this reason, exports are mainly low value-added production such as agricultural products and importing is the fastest way to reach high technology products or inputs. In this consideration, import seems a key tool to solve the issues and improve domestic market and thus economic development (Chen, 2009).

Some studies have shown that, not checking import control, causality between exports and growth can be counterfeit and misleading (Esfahani, 1991; Riezman et al., 1996;

Thangavelu and Gulasekaran, 2004). Imports can be highly significant for any economy since growth in exports is often observed by growing imports (Miroudot, et al., 2009). In addition, excluding imports out of analysis between export and growth can show the ice on the surface. Examining micro dynamics of imports can create opportunity to see deepen interactions and connections through the domestic market to international market. (Awokuse, 2008). More future studies have potential to fill and deepen literature by trying to reinterpretation of import- economic growth relation in terms of direct effect.

1.2.4. Foreign Direct Investment (FDI) and Economic Growth

The relationship between FDI and growth is extensively focused on the inward FDI and trade side through the different channels. Majority of them attempt to reveal impacts of FDI on economic growth. Theoretical background of studies mainly is based on the works of the Heckscher (1919), Ohlin (1933), Mundell (1968); Kojima (1975,1977,1982); Horstmann and Markusen (1984); Helpman and Krugman (1985); Blomström (1990); Markusen (2002); Brian, Hanson, and Harrison (1997); Helpman, Melitz, and Rubinstein (2003); Barrios, Görg and Strobl (2005).

The main concentration of the studies to show that complementary or substitution of the FDI and exports. Markusen (1997, 2002) notes that both vertical and horizontal FDI occur internally and country characteristics such as relative skilled labor donations, differences between country size, level of trade costs. Liberalization of investment encourages exports when countries differ in relative skills endowment as long as trade costs are low, but liberalization of investment decrease exports when trade costs are high and countries are similar in terms of relative skills endowments (Amiti and Wakelin, 2002). In Mundell (1968) study, based on the Heckscher (1919) -Ohlin (1933) model, mobility of capital internationally tends to countervail the prices of goods internationally, so trade and FDI can be regarded as substitutes. This work has completed by Kojima (1975, 1977, 1982) by stating that labor-intensive goods produced in developing countries at the country level where comparative boundaries edge returns to the country of origin of FDI.

The vertical aspect of FDI stimulates trade by multinational firms, the geographically divided phase of production. Access to international networks of major companies is essential for export promotion (Markusen, 1998).

Inflow of FDI by the multinational companies can affect changes in the production structure by leading to the opening of new local businesses in the host country, and causing existing ones to change the scope and development of production. This means that FDI also affects the distribution of exports by industry and geographic area. Multinational companies provide technologies necessary for the growth of the industry with technology reinforcement, expanding and integrating their production networks (Dobson and Chia, 1997). This impact makes domestic firms more willing to export. Besides, the share of labor-intensive goods in exports decreases over time, unlike the production and exports of rising capital-intensive goods. Also, inflow FDI has potential to affect negatively for developing country due to increases in the pay levels and other issues developed in the domestic and international market (Lipsey, 2000; 2002).

1.3. Methodology

Design of the thesis

The purpose of the current thesis is to explore whether the relationship between trade and growth differs by trade liberalization policy. To accomplish this overarching aim, this thesis addresses four questions. As such, the research has been divided into four streams to address each specific research question.

1st Stream

The first stream aims to explore how the relationship between trade and growth differed with different trade liberalization policy choices in China and Turkey. The reasons for selecting China and Turkey were: 1) These countries adopted the different type of liberalization. Turkey followed Washington Consensus type of trade liberalization while China preferred to develop different 'Beijing Consensus'. 2) They carried out the trade liberalization reforms in close years (1978 and 1980, respectively). 3) They were two middle income countries that had close GDP per capita income levels in 2018. Two investigations have been conducted in this stream.

> First investigation focused on the causal relationship between trade and economic growth. The logarithm of real GDP was used as the measurement of economic growth (Constant 2015 US$), as well as the logarithm of exports of goods and services (Constant 2015 US$) and the logarithm of imports of goods and services (Constant 2015 US$) were used as the measurements of the trade. Data was annual and imported from the World Bank database between the years of 1978 to 2017 for China and 1980-2017 for Turkey. VEC model was applied for this investigation. (See Chapter 3).

Second investigation focused on interdependencies of exports and imports. Foreign value-added content of gross exports, domestic value-added in foreign final demand, imported intermediate goods for exports, main trade partners were examined for this investigation. Trade in Value-Added (TIVA) analysis was used for this. Data was imported from OECD database. Purpose of the analysis was to investigate whether trade liberalization favored countries on the axis of import and export dependency considering production fragmentation in the years of 2005-2016. (See Chapter 3).

2nd Stream

This stream focused on the relationship between trade and growth in China and thirteen developing countries (including Turkey) following Washington consensus policies. The reason for including the other developing countries was to explore whether the associations between imports, export and GDP in Turkey, which differed from those in China, apply to other countries following the Washington Consensus. These countries were selected considering the following four criteria: 1) Middle income countries due to different stage of development may call for different strategies of development. 2) Countries population were over 10 million in the year 2017 to avoid low population countries. Low population countries have limited resources, not competitive domestic market and high degree of dependency to international trade. 3) Countries liberalizing trade. The reason was to observe dynamics relationship between trade and growth with high degree of participation to international trade. 4) Excluding countries such as Russia and Kazakhstan where most of their exports are made up of natural gas. Cuba is also excluded due to the long term and strict embargo by USA and majority of industrialized countries.

The imports, exports, and GDP data of these countries from 1980 to 2017 were used. VAR and VEC models were also applied to investigate the relationship between trade and growth in these countries. (See Chapter 4).

3^rd^ Stream

Findings of the first and second stream led two further investigations. The first was to explore whether imports played a role in GDP. Thus, the third stream examined the role of imports components in GDP growth in Turkey. Import components and GDP data from 1998Q1 to 2018Q3 were used. VEC model was conducted to analyze the data (See Chapter 5).

4^th^ Stream

The second was to explain domestic market productivity in China, Turkey and other selected developing countries in *2^nd^ Stream*. Therefore, by using panel analysis, the fourth stream investigated whether Foreign Direct Investment (FDI) had a critical role in Domestic Value-Added Exports in developing countries. Inflow FDI and Domestic Value-Added Content of Gross Exports data of all countries from 2005 to 2015 were used (See Chapter 6).

Methodology

Vector Autoregressive Model (VAR)

VAR model is a multivariate system where any of each variable is defined with historical values of all variables estimated in a system. Since the work of Sims (1980), it has been widely used and extended for modeling and forecasting. VAR model built cointegration relationships to model specification, thus long-term behavior of endogenous variables converges the cointegration relationships and provides short-term adjustment dynamics (See Chapter 4).

Vector Error Correction Model (VEC)

As a multivariate time series, VEC (Vector Error Correction) model is a full information maximum likelihood estimation model and provides a more efficient estimator for cointegration vectors that allows a VEC to be tested in a system of all equations in one step without testing the normalization of a given variable. The term cointegration is known as the error correction term as the deviation from equilibrium is gradually corrected in the long run by a series of partial short-term adjustments (See Chapter 3). Therefore, VAR and VEC models are typically and commonly applying for study the dynamics of the growth and chosen macroeconomic indicators by economists (Wan and Xie, 2006; Lin and Cao, 2007; Yu and Sun; 2016).

Trade in Value-Added (TIVA)

Trade in Value-Added (TIVA) defines a statistical methodology to offer new perspectives on trade relations between countries and provide a wide and deepen information of where value is created at every stage of the global value chains (See Chapter 3). The TIVA approach was used because it draws a more detailed picture from the basic trade measures at the macro level, offers the higher contribution of services in global value chains, measures the imports' impact on export performance and the reveals the form of economic dependencies among the countries (OECD, 2018).

Panel Analysis: The Random and Fixed Effects Models

Panel analysis is a statistical method typically applied in econometrics to examine longitudinal and cross-sectional panel data. Panel data is highly useful when target variable has dependency on explanatory variables. When omitted variables are constant during the period, then estimators of panel data offer a consistent estimate of the observed explanatory variables effect. The Fixed and Random Effect Models were used this panel data to analyze impact of variables over time and reveal differences between subgroup on the dependent variable. In the random effects model, as a random variable the individual-specific effect doesn't have correlation with the explanatory variables. In the fixed effects model, unlike the Random Effect model, as a random variable the individual-specific effect can be accepted to be correlated with the explanatory variables (See Chapter 6).

1.4. Research Motivation and Significance

After the failure of the traditional import substitution strategy implemented by many developing economies in the 1950-1970s, many countries transformed towards market-oriented reform programs and trade liberalization policies designed by international financial, trade and economic institutions. These trade and economic policy proposals were later framed as the Washington Consensus Policy recommendations for developing countries. Encouragement by western countries and international organizations such as the IMF and the World Bank has spread the adoption of the Washington Consensus policy. In this respect, the 1980s - 1990s turned into a fast and volatile growth trend with the liberalization of trade in terms of countries and world economy.

Trade liberalization has resulted in static gains among countries in the form of increased production, consumption and employment, as well as benefits from trade by more foreign investment, research and development expenditures, industrialization and development.

By the trade liberalization, China has experienced marvelous growth development, and trade liberalization is a critical element to this achievement. Yet, majority of developing countries more liberalized in trade and other areas, are not growing like China. Their openness is strongly guided by Washington Consensus as opposite to China's approach that is named ‘Beijing Consensus’ or ‘China Model’. China has achieved to integrate its own economic background and global market without surrendering to market as Washington Consensus.

China and Turkey carried out trade liberalization reforms in close years and Turkey is an example of following closely the Washington Consensus type of liberalization. Yet, growth experience of Turkey has not been remarkable even though Turkey was shown successful based on high growth rate trend in the following years of 2000s as a country guided by Washington Consensus.

The first motivation for this research is to provide more empirical evidence of the relationship between trade and economic growth. Indeed, there are many empirical studies of this relationship and mixed findings. The findings may differ on the basis of countries, as well as differ for the same country. Majority of the findings reveal the positive effect of trade on economic growth. Also, many studies show the contribution of economic growth to trade. In this empirical research, there is re-examination of the relationship between economic growth and trade for the economies that realized trade liberalization under different policy choices. Examining China and Turkey (and some other developing economies) to analyze puzzling heterogeneous relationship between trade liberalization and growth can be enlightening for policy makers and economists.

The second motivation for this research is to examine the interdependencies of the exports and imports with the focus of production fragmentation by using Trade in Value-Added indicators. The majority of empirical studies examining the relationship between trade and growth are on the export and GDP axis. In this context, the relationship between imports and exports has not been adequately studied in the literature. This research reveals new perspectives on imports and exports dependency in country and industry level in the international market.

The third motivation for this research is to examine relationship between imports components and growth in terms of causality. There are limited studies in the literature that analyze the causal relationship between imports and growth due to the lack of theoretical background. Findings are resulted various regarding to causality and direction. It is possible import components have impact on the growth by increasing or decreasing the production efficiency and productivity.

The fourth motivation for this research is to find a link to domestic market productivity through foreign direct investment within the scope of trade liberalization.

The fifth motivation for this research is to examine Washington Consensus and Beijing Consensus with empirical findings from the relationship between trade and growth after trade liberalization of developing countries.

1.5. Research Questions

i. How did the relationship between trade and growth differ in China and Turkey with the different trade liberalization policy choices? Did trade liberalization strengthen the domestic market in terms of import and export dependency?

ii. How did the Washington Consensus type of trade liberalization affect growth in developing countries? Could they benefit from trade as much as China?

iii. Do import components cause economic growth?

iv. Does foreign direct investment have critical role in domestic production for developing countries?

1.6. Contribution to the Study

The first contribution of this research is to investigate the causality relationship between GDP, imports and exports using Vector Autoregressive Model (VAR) and Vector Error Correction Model (VEC) models for China and Turkey after trade liberalization reforms. Moreover, Impulse Response Function and Variance Decomposition are used to deepen this relationship by assessing how shocks for economic variables will resonate through the system. In addition, this research reveals the interdependencies of exports and imports via Trade in Value-Added Analysis (TIVA). It combines nature of indicators regarding to value-added origins of imports, exports and final demand for China and Turkey in both industries and sectors levels that draws a more detailed picture from the basic trade measures at the macro level. It offers the higher contribution of services in Global Value Chains (GVCs), measures the imports' role in export performance and the details economic dependencies among the countries. This investigation also provides us with an observation of the foreign trade and growth relationship of the two countries that have implemented the different trade liberalization type reforms. This research is one of the first kind to present a broad and in-depth analysis of the relationship between economic growth and trade in terms of both domestic and international markets.

The second contribution of this research is to examine the trade and growth experiences of selected developing countries (Argentina, Brazil, Colombia, Dominican Republic, Ecuador, Greece, Malaysia, Mexico, Peru, Poland, Romania, Thailand and Turkey) and China in the years of 1980-2017 to draw an international frame regarding of the development journey of countries by applying empirical analysis and viewing macroeconomic and trade indicators. These countries were selected considering the following four criteria: 1) Middle income countries due to different stage of development may call for different of strategies of development. 2) Countries population were over 10 million in the year 2017 to avoid low population countries. Low population countries have limited resources, not competitive domestic market and high degree of dependency to international trade. 3) Countries liberalizing trade. The reason was to observe dynamics relationship between trade and growth with high degree of participation to international trade. 4) Excluding countries such as Russia and Kazakhstan where most of their exports are made up of natural gas. Cuba is also excluded due to the long term and strict embargo by USA and majority of industrialized countries. Another common point of the selected countries is that they carry out trade liberalization and economic liberalization under the influence or guidance of the Washington Consensus policy recommendations. As a pioneer study, this research creates an opportunity to make a general assessment of developing countries whose trade and economic reforms are guided by Washington Consensus and China's trade liberalization and economic reforms, called the Beijing Consensus.

The third contribution of this research is to look into relationships between import components (intermediate goods, capital goods, consumption goods) classification by Broad Economic Categories and GDP for Turkey in 1998Q1-2018Q3 by using VEC Model to deepen the causality of imports to growth in Turkey and majority of developing countries previously indicated. This research is one of the few investigations to scrutinize importance of import components for economic growth.

The fourth contribution of this research is to investigate the relationship between inflow FDI and domestic market productivity by using panel analysis for selected developing countries between the years of 2005-2015. This is a pioneer research that investigate the role of FDI on the domestic value-added content of exports whether foreign direct investment has a critical role in domestic market enhancing in terms of domestic value added content in developing countries.

1.7. Structure of the Thesis

<u>This thesis consists of 7 chapters. The first chapter</u>, as an introductory chapter, provides a background for the problem covered in the thesis. Then, chapter continues with theoretical framework on which the thesis is based on. The theories on the relationship between foreign trade and growth over time, contributed by many economists with different views, have been discussed briefly under sub-headings. In addition, design and methodology of thesis were discussed briefly. Chapter concludes with the contribution of the research and the thesis organization for guidance. <u>The second chapter</u> includes the review of the literature on the research theme and scope. Research studies in foreign trade growth axis conducted by economists all over the world were critically examined and categorized under various sub-themes in accordance with the content of the study.

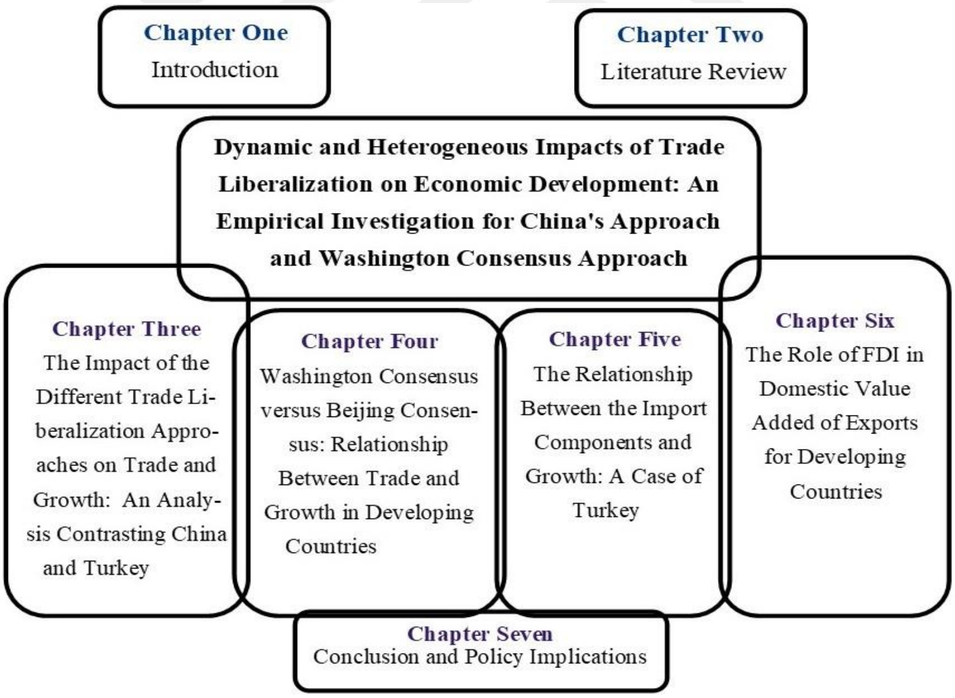


Figure 1. Thesis Structure

<u>The third chapter</u> is covered by analysis for China and Turkey after trade liberalization reforms. Analysis started with an overview about trade liberalization journey for both countries separately. Then, empirical analysis was conducted to reveal relationship between trade and growth for China and Turkey since opening up by applying VEC model

supported with IRF and Variance Decomposition. After that, the relationship between imports and exports was examined in terms of domestic industries and the international market by Trade in Value Added (TIVA) Analysis in order to support and deepen the empirical analysis.

The fourth chapter covers the analysis of relationship between trade and growth for some developing countries by using the VAR and VEC models included IRF and Variance Decomposition in order to interpret previous findings at a macro level. Chapter started with an economic overview included critic trade and growth indicators to draw a frame about selected countries on the growth-foreign trade axis. Then it continued with the empirical overview in terms of the econometric findings for selected countries included Turkey and China. In the last part, results of the empirical analysis for selected countries were discussed broadly and separately.

The fifth chapter includes an analysis on imports and economic growth. There is investigation on relationship between the import components such as imported intermediate goods, imported capital goods and imported consumption goods and GDP for Turkey by applying VEC model included. IRF and Variance Decomposition were used in order to deepen the causality of imports to growth in Turkey and majority of developing countries previously indicated.

The sixth chapter of the thesis focuses on impact of FDI on domestic value-added exports by applying panel analysis cross section models for selected developing countries to investigate role of FDI in economic growth.

The seventh and last chapter is the conclusion. It provides a broad summary of the three research streams with the major findings. In addition, some policy implications and recommendations were discussed to contribute to future perspectives.

Chapter Two: Literature Review

In economic literature, as the theory of trade does not offer explanatory guidance on trade and economic growth in terms of causality, economists mostly use empirical analysis to reveal casual relations among them. Significantly there are two main methods used to reveal the export and import importance to growth either together or separately. Simple regression and multiple regressions or causality technique. Lately, Vector Autoregressive (VAR) model and Vector Error Correction (VEC) model with cointegration approach have been used in the majority of the works.

2.1. Trade Openness and Economic Growth

Relationship between trade openness and growth are studied by many economists such as Dollar (1992), Islam (1995), Barro and Lee (1994), Edwards (1998), Irwin and Tervio (2000), Easterly and Levine (2001). Their findings show that trade openness is a significant explanatory variable influencing economic growth in line with of Grossman and Helpman (1991) and Barro and Sala-i-Martin (1997), Frankel and Romer (1999, Alcala and Ciccone (2004), Wacziarg and Welch (2008) and Rodrik and Rodrigez (2000); works. Also, after comparing open economies to closed economies, Warner (1995) found that free trade causes more growth in the economies rather than closed economies.

In addition, there are different findings about causality directions through the trade openness in growth. Some investigations suggest the causality from trade openness to economic growth (Berg, 1996; Frankel and Romer, 1999; Ghatak et al.,1997; Utkulu and

Özdemir, 2004; Irwin and Tervio, 2002; Wacziarg, 2001). Also, some investigations resulted with two-way causality between trade openness and economic growth (Liu et al.,1997; Afxentiou and Serletis, 1992; Tsen, 2006; Riezman et al., 1996).

2.2. Export-led Growth and Growth-led Export

Export-led Growth, Growth-led Export or a two-way causal relationship or no causality stand casual direction between export and growth which is supported by many empirical studies. Krueger (1998), found that growth in exports generally affects the growth of countries in a positive way. According to Sharer (1999), exports appear to be engine of growth. Thirwall (2011) came the conclusion that the only important parameter for economic growth in terms of individual performance after scrutinizing 133 countries' economic performance from 1995 to 2006. Parteka and Tamberi (2013) found trade between countries stimulates economic growth by the using annual trade and growth data of 163 countries between 1988 and 2010. Jung and Marshall (1985) revealed weak tie to export-led growth hypothesis by using causality technique in the 37 developing countries. Many researches focus on the developing countries to export-led hypothesis such as Sheehey, 1992; Balassa, 1978, some economists (Awokuse, 2003; Awokuse, 2008; Dar and Amirkhalkhali, 2003; Ghartey, 1993 and Sharma, et al, 1991) focus on developed countries and findings are mixed to support both export-led growth and growth-led export. Moreover. Ghartey (1993), analyzed the United States, Japan and Taiwan in his study and reached an interesting conclusion. In the US, the GDP supports exports, while in Taiwan casual relation come from exports to growth. On the other hand, for Japan, this relationship is a two-way causality.

Chow (1987) examined export growth and growth relationship in eight industrializing countries and reached conclusion of strong two-way causality. In addition, some other economists found the same empirical evidence indicated a bi-directional causality (Giles and Williams, 2000; Riezman, et al, 1996; ; Shan and Sun 1998; Xu, 1996 and Berg and Schmidt, 1994). On the other hand, Bahmani-Oskooee (1991) revealed both negative and positive impacts in both directions after examining from the panel sample of twenty countries.

Ahmad and Kwan (1991) run an investigation on exports and growth in 47 African countries and observed no any causality. Similarly, Jung and Marshall (1985) reached the same conclusion by analyzing GDP and export in the developing countries between the years of 1950-1981.

2.3. China Case

Many investigations have been run on relationship between trade and growth in China. Shan and Sun (1998) studied between the years of 1978 and 1996 and could not find causality between export and growth in. Kwan and Kwok (1995) and Kwan and Cotsomitis (1991) applied the granger causality test and came to the conclusion of one-way causal relationship from foreign trade to growth. Lui et al., (2010) found a long-run relationship with two-way causality after testing the growth and exports variables. Wan and Xie (2006) analyzed China's GDP, import and export between 1978 and 2004 by using error correction model and co-integration theory. Findings showed that foreign trade improves the growth in the short and long term. Lin and Cai (2007) revealed strong positive interactive response function between economic growth and three indicators (foreign direct investments, goods trade and service trade) after opening up by the using VAR model to analyze the relativity for data 1984-2006. On the other hand, Cao (2005) came to conclusion that economic growth has key role promoting foreign trade after investigating the floating of exchange rates and trade by using time series analysis between the years of 1978 to 2004.

By the testing growth with the export-orientation, Li (1992) found significant effect of export on economic growth. Analysis of Yang (1998) revealed positive correlation of exports with the economy by applying Balassa model and determined. Sun's (2010) study concluded with the less involvement of net exports to economic growth. Shen (1999) found two-way causality between export and growth in short term but no any relation in long term. with using co-integration and Granger causality test in the years from 1977 to 1998. Fan, Mao and Wang (2005) revealed the one-way causality from exports to GDP by using Granger causality technique in the years of 1952 to 2003.

Yu and Sun (2016) analyzed the relationship between import, export and GDP in China by applying the VAR model in the years of 1978 to 2008 and found that export has high influenced on GDP, import relatively has a far less influence on GDP. Tong (1995), investigated the imports impacts on economic growth and showed that imports made various contributions to the domestic economy at different times. Also, positive effects of growth and imports to each other was another conclusion. Moreover, Liu (2001) revealed the strong role of imports on the domestic economy in China in the 1980 to 1998. Another finding was about weak correlation of Chinese exports on the economy and the export structure. That's underline the role of imports in the China by trade openness.

2.4. Turkey Case

In recent years the relationship between growth and trade has been demonstrated in several studies on Turkey. Yapraklı (2007) analyzed the economic growth, trade openness and financial openness from 1990 to 2006 by using vector error correction model. Study showed the negative impact of financial openness on growth. Also shown trade openness positively affected the economic growth. Similar investigation and findings are revealed by Yücel (2009). Results showed the positive impact on trade openness to growth and negative impact of financial openness on the growth by using granger causality and cointegration tests. Adak (2010) examined the relationship between economic growth and foreign trade after trade liberalization and found that growth in foreign trade causes positive and stable impact on increase in GDP per capita for the years of 1981-2007.

Temiz and Gökmen (2010) examined relationship between exports and growth by using vector error correction model in the years of 1950-2006. Result showed causality from growth to exports. After examining foreign trade and GDP in the 1989-2007 with Granger causality, Kotil and Konur (2010) revealed export-led growth and also found the causal direction from GDP to import and export to GDP. Another Export-led growth analysis was conducted by Öztürk and Acaravcı (2010) on data of export and growth between 1989 and 2006. Study resulted exports causal direction to GDP by using the VAR model. Çetinkaya and Erdoğan (2010) also used VAR model for analyzing relationship between import, export and GDP in Turkey in the years of 2002-2010. Their findings showed two-way causal relationship between import and GDP and. Besides, they found two-way causality relationship between imports and exports. Study on the relationship between trade with GNP instead of GDP, Akcan and Metin (2018) analyzed import, export and gross national product (GNP) between 2000 and 2017 and found import and export causality to economic growth before 2008 crisis. Also, it was stated that the causality direction from export to growth was lost after crisis period. Yüksel and Zengin (2016) used VEC on data of growth, export and import for 6 countries (Turkey, Brazil, Argentina, China, Mexico and Malaysia) between 1961-2014. They found the causality between export and import in Turkey and China. Also, they showed that relationship between trade and growth is heterogenous in developing countries.

2.5. Imports and Economic Growth

There are limited studies in the literature that analyze the causal relationship between imports and growth by taking into account the possible effects of imports on economic growth which are resulted in different regarding to causality and direction. Li, et al., (2003) run an investigation on economic growth by imports of services including 82 countries as panel analysis. Result suggested the positive effect in developing countries and negative effect in developed countries from imports of services to growth. Another finding from Veeramani's (2009) study is that knowledge in rich countries gives them comparative advantages in higher yield products. Also, what kind of intermediate goods and capital equipment a country imports into are important for the long-term growth of that country. Where the import is made is also determinant at this point. Furthermore, Arawomo (2014) also run investigation the effect of capital imports on economic growth using Panel ARDL for West African countries between 1970-2012. It showed that capital imports have a positive and significant impact on economic growth in the short and long run. Kim, et al., (2007) investigate the relationship between exports, imports, and economic growth from 1980 to 2003. They revealed strong role of imports on the productivity caused by competitiveness comes from imported consumption goods and imported capital goods embodied with technology from developed countries. This strong relation is not valid for imported intermediate inputs or raw materials. Conclusion comes from that liberalized imports enhances development. (Miroudot, et al., 2009) states importance of import by claiming empirical analysis of the relationship between trade and growth requires not only exports but also imports and exports. Based on the analysis of intermediate goods and services trade flows with OECD countries, imported inputs increase productivity in local industries as well as reduce inefficiencies in technology use.

Hamdan (2016) run a panel analysis on growth, exports and imports for 17 Arab countries in the years of 1995-2013. Study is resulted by positive impact of exports and imports on the economic growth and living standards with underlining efficiency of production caused from imported technology through the trade. Another analysis comes from Ghazali and Loganathan (2011) by applying causality and cointegrations techniques in Malaysia between the years of 1970-2007. Results indicated the two-way contribution of imports and growth to each other in long run.

Imports, exports and growth are also investigated in works of the Bakari (2016) and Bakari and Mabrouki (2017) for Canada and Panama. Both findings of works are consistent with each other by revealing strong causality directions from both imports and exports to economic growth.

2.6. Foreign Direct Investment (FDI) and Economic Growth

Impacts of the FDI on economic growth is widely studied in the literature from different aspects and angles regarding to relationship between direct foreign investments and export in the both domestic and international market frame. Findings are mixed. Borenzstein, et al. get. (1998) run a cross-country regression to finding FDI impact on growth using data of two decades from industrial countries to 69 developing countries and found that FDI is a significant tool for technology transfer and that contributes to growth relatively higher than domestic investment. Bevan and Estrin (2004) apply panel data to analyze the inward FDI determinants for Middle Eastern European economies with a focus. Source countries (EU-14) selected according to the main suppliers of FDI (87%) regarding to bilateral flows in the period 1994-200. FDI costs, proximity, trade, risk, etc. Random effects were used after the Hausmann test. Their analysis shows that integration with the EU is critic for accelerating FDI in direction to transition economies. It also provides more development for the economy with possible risks. Asteriou et al. (2005) analyzed some transition countries from the angle of net inflows of foreign investments. Results indicate that planned foreign investments cause positive impact on growth. In addition, transition economies have cheap labor that creates attraction for FDI.

Değer and Emsen (2006) examine countries rising up from the collapse of the Soviet Union in the period of 1990-2002 in terms of FDI and growth by panel data analysis. Results reveal that sustainable FDI inflows to developing countries has key role in the economic growth. Hansen and Rand (2005) examined the relationship between FDI and GDP for developing countries in the years of 1970-2000. Findings showed a strong causality relationship of GDP and FDI in the long run. Also, increasing the FDI in capital formation also increases positive effect on growth. In addition, Ağayev (2010) examined the relationship between economic growth and FDI for the 25 countries by panel data. Results show that FDI flows have critic role for economic growth in transition economies. Teker et al. (2013), analyzed some European transition and Asian countries in focus of foreign direct investments in in the 1992 and 2011 by using panel analysis. Results indicate strong relationship between FDI and GDP.

Kar and Tatlıöz (2008), studied the period from 1980 to 2003 inward FDI determinants of Turkey. They revealed that relationship between inward FDI and net international reserves, gross national product, electric power generation index, openness ratio, and investment incentives is positive. On the other hand, relationship between inward FDI and labor costs and real exchange rate is negative. Wang (2009) found that FDI flows in total significantly affected growth caused by improved manufacturing sectors by using a panel analysis of data for 12 Asian economies in the years of 1987-1997. Doytch and

Uctum (2011) observed same results from manufacturing-based large economies, Latin America and the Caribbean Region, Europe and Central Asia, low-income countries that total FDI increased growth. Koyuncu (2010), examined inward FDI for Turkey by applying structural vector autoregression analysis between the 1990-2009. Results revealed the inward FDI is affected significantly by changes in the amount of FDI for the previous period, GDP, net international reserves and trade openness.

Chimobi (2010) investigated the FDI and exports contribution to economic growth using Granger causality and cointegration tests. Results revealed that relationship between FDI and growth is bilateral but not significant statistically.

Chapter Three: The Impact of the Different Trade Liberalization Approaches on Trade and Growth: An Analysis Contrasting China and Turkey

The purpose of the current thesis is to explore whether the relationship between trade and growth differs by trade liberalization policy. To accomplish the overarching aim of this thesis, the first chapter focuses on China and Turkey. There were three reasons to this: 1) They adopted different type of liberalization after abandoning import substitution policy. Turkey followed Washington Consensus type of trade liberalization while China followed its own unique approach. 2) China and Turkey carried out the trade liberalization reforms in close years (1978 and 1980, respectively), and 3) they were two middle income countries that had close GDP per capita income levels in 2018. Besides, my doctorate education is funded by the Ministry of Education of Turkey. As a mandatory requirement of this fund, my thesis research has to analyze China and Turkey together. The purpose behind this requirement is to investigate the possibility of learning from China's development experience.

3.1. Overview

Turkey and China participated in the foreign trade in the period close to each other (China 1978, Turkey 1980). According to data from the World Bank, over the years they attended open foreign trade China (1978) was the world's 10th largest economy and Turkey (1980) was the 26th largest economy in the world GDP ranking. By the end of 2017, China’s position was world's 2nd and Turkey was the 17th largest economy. It would not be wrong to argue that participation in foreign trade has made the two countries better positioned in the world economy ranking over the years.

The two countries have also achieved a significant development in GDP per capita. GDP per capita in China was 156 USD in the year of trade openness (1978). As of 2017, it reached 8633 USD which is 50 times bigger. In Turkey, GDP per capita was 1564 USD in the year of trade openness (1980), and it increased to 10518 USD by the 2017.

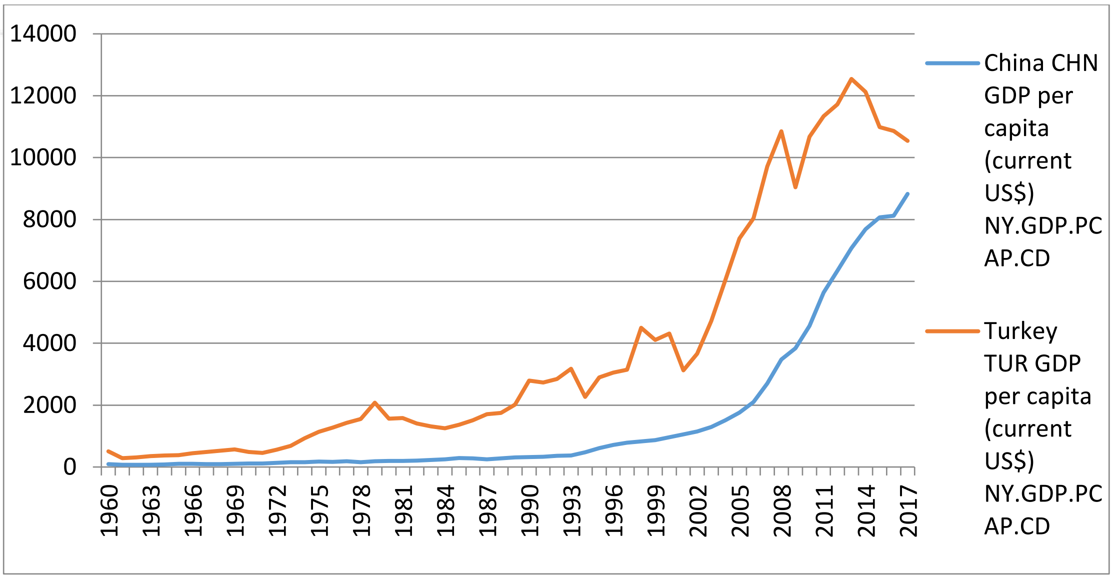


Figure 1. China and Turkey GDP Per Capita

Source: World Bank (2019a)

In the Figure 2, trade percentage of GDP shows that both countries are around %10 in the years of beginning trade openness. For China It reaches almost %50 over the years then starts to decline after 2008 global economics crisis and goes down below %40. For Turkey, it goes up over %50.

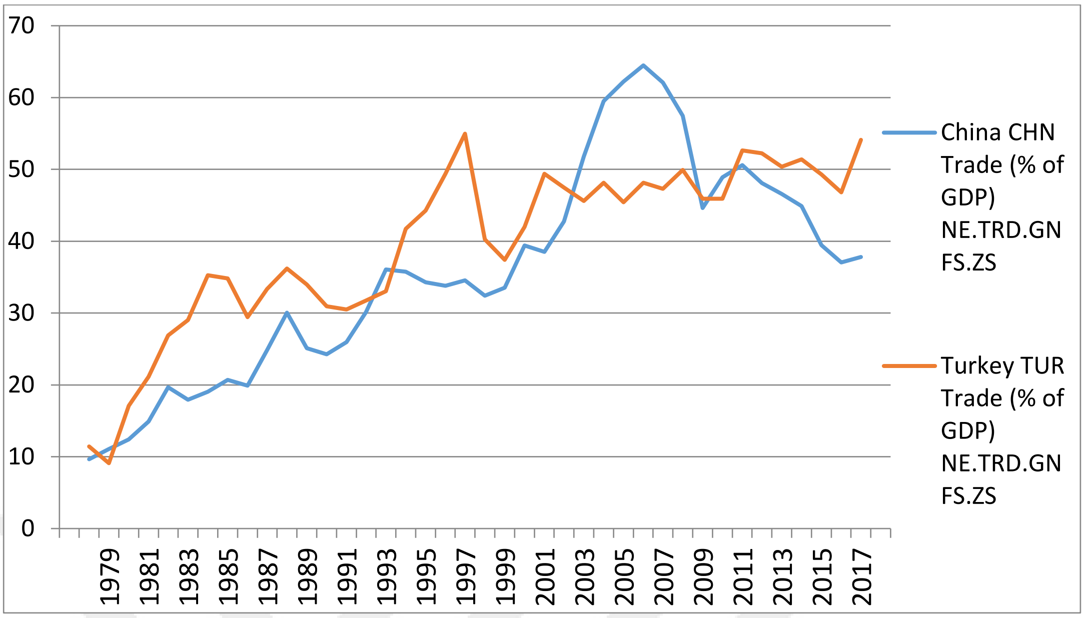


Figure 2. China and Turkey Trade Percentage of GDP

Source: World Bank (2019b)

As seen in the Figure 3 and Figure 4, Turkey's foreign trade indicates import surplus after trade liberalization until present, whereas China is experiencing a foreign trade experience with an export surplus start from trade liberalization until now. This situation in a diametrically opposite positions needs to be explained whether it is caused by economy policy failure or other economic and politic reasons between two countries that to trade liberalization for very short period of time from each other. Since China and Turkey follow different recipes on trade liberalization, it can be insightful to understand China’s policy preference for Turkey and other developing countries.

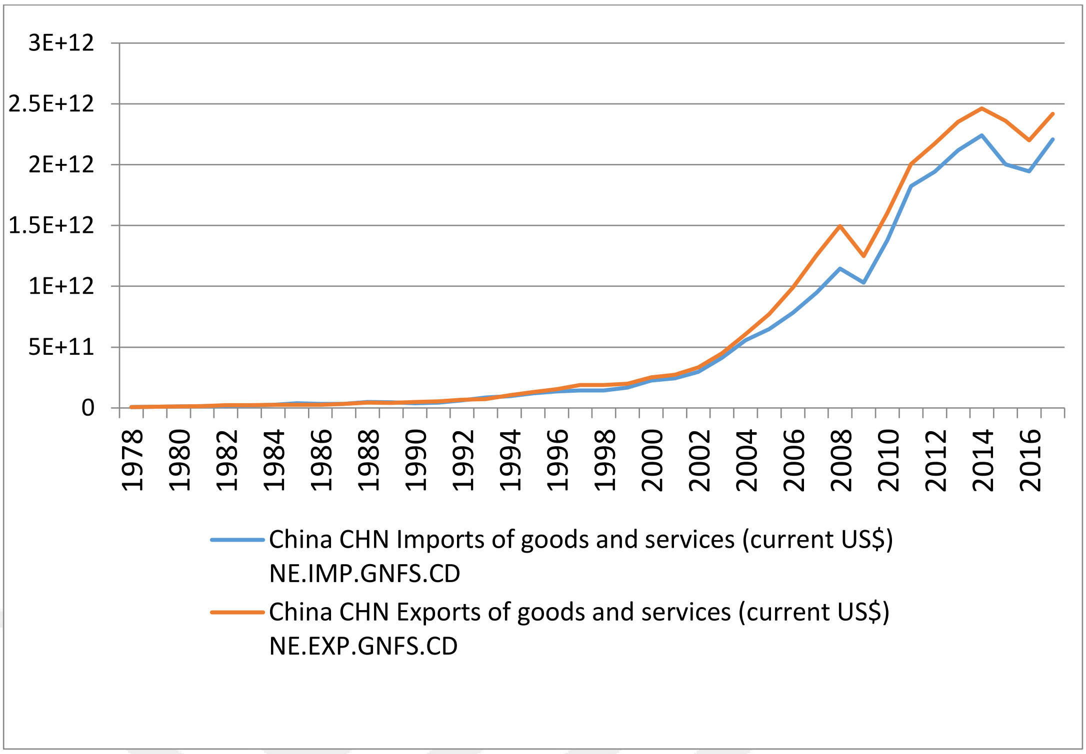


Figure 3. China Imports and Exports of Goods and Services

Source: World Bank (2019c)

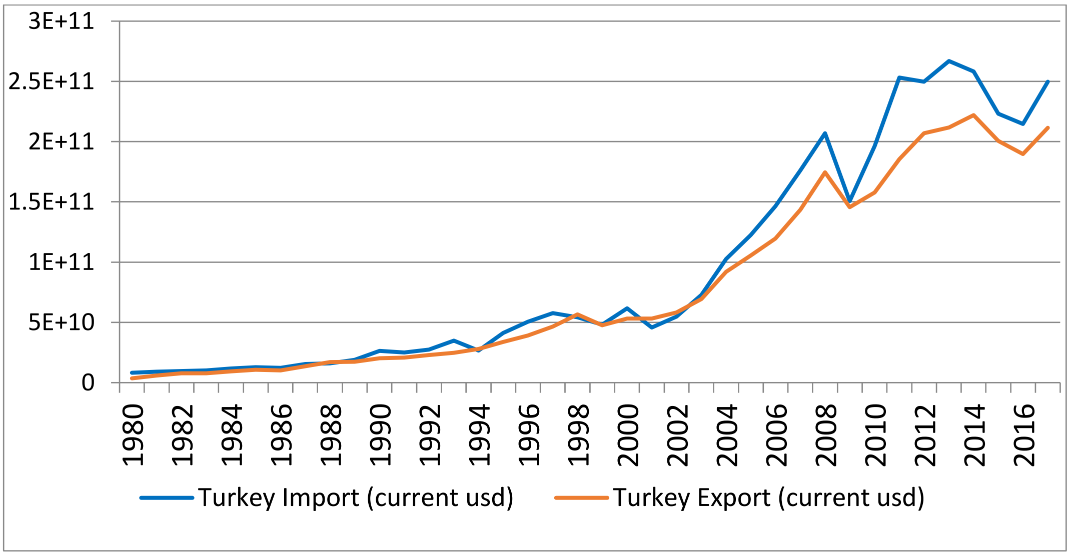


Figure 4. Turkey Imports and Exports of Goods and Services

Source: World Bank (2019d)

3.2. Trade Liberalization

3.2.1. China

By the decision of opening up and becoming an active participant in global markets, China has succeeded in transforming from a state that can be considered closed to a fully integrated international economy. Particularly, with its participation in the World Trade Organization (WTO), China's integration into international production networks and global value chains has put foreign trade in a rapid growth trend and transformed China into a global production and trade base.

According to World Bank database, China has rapid growth in the years between 1978 and 2017 and the average annual growth rate of China's total foreign trade was 14.1 percent, above the global average. The total value of imports and exports increased from $ 206 billion in 1978 to $ 4.1 trillion in 2017. During this period, exports increased from $ 10 billion to $ 2.2 trillion, and imports rose from $ 11 billion to $ 1.8 trillion. Although there was a slowdown in exports during the global financial crisis that emerged in 2008, the momentum of trade showed a continuous increase after China's accession to the WTO in 2001.China's global ranking on the scale of foreign trade is the number one while it was 32 in 1978. The share of China's exports in global trade was below 2 percent in 1978, but increased by 12 percent in 2017 as higher level than all other countries.

Before implementing the decision to open up, China followed an introverted development strategy by applying import substitution industrialization as common development model prevalent in developing countries by 1950s. Imports were only basic raw materials and capital goods due to shortages in domestic production. Export was a way of providing foreign currency for imports. The foreign trade reform of 1978 was the part of the overall economic transformation and it took role to China from an autarkic and introverted state to one of the most important players in the international market. Furthermore, China's perspective on trade reform was in line with its general approach to the economic transformation with features of administrative decentralization by retaining ultimate control in the center, gradual changes, dualistic concept, parallel pricing. In the journey opening up there have been major changes in the structure of Chinese trade over the past 40 years (Garnaut and Song; 2018). The center of gravity of exports has shifted from low technology products (textiles) to medium technology products (mechanical and electrical products) and then to high technology products. Besides, with the participation of China in the WTO, the ownership structure of enterprises participating in foreign trade has undergone major changes. While before 1998 State Owned Enterprises (SOE) dominated China's export growth, after 1998, after China began to gradually reform in foreign trade, private companies became the most important element for China's export growth (Li, K., & Jiang, W.; 2018).

Looking from a retrospective historical perspective, China's trade liberalization can be examined in 3 periods as breaking points. First, the period from 1978 to 1991 when trade planning was decentralized administratively to lower levels of governments, with economic incentives increasing exports by reforming in the contract responsibility system for foreign trade, exchange rate, foreign exchange retention system and other measures. First step was to use the local dynamics for exports more efficiently by directing the authority to deal with foreign trade from the center towards local governments. National foreign trade companies were no longer monopolies and provincial branches were allowed to become independent financial and operational bodies leading to an increase in export trading companies. The reform reduced government controls in the trade management gradually. The main focus for this period can be expressed as trying to increase exports through incentives while providing domestic protection by strengthening local governments on foreign trade. Koves and Marer (1991) called this policy practice ‘protected export promotion system’ when it comes to in the early 1990s.The second period is the period of bold moves to liberalize trade from 1992 to 2000 such as relaxing the imports. First important step was memorandum signed in the 1991 between China and United States to reduce tariffs and restrictions on the imports. In the following years, relaxing on the imports continued on a wide variety of products with different contents and scales (Li, K., & Jiang, W.; 2018). By 2000s, China weas more integrated to the world in terms of the foreign trade. Third, from the period of WTO accession in 2001 to present with rapid integration into the global trade as result of comprehensive liberalization. Accession to the WTO in 2001 was the most important point in the reform and opening history for China. It pointed to the recognition of China's market-oriented reform by the international community and the expansion of international trade rules and standards in the Chinese market. By joining the WTO, China fulfilled its commitments in many aspects. Tariff rates were reduced for all taxable items. And import quotas and licenses were phased out by the time. Numerous administrative laws and regulations regarding trade were revised and amended to eliminate WTO's inconsistencies in national treatment. The foreign trade approval system applied for trade activity licensing was canceled. The policy regulations and reforms significantly increased the transparency of economic and commercial laws, policies and regulations.

In summary, China's trade system reform process accelerated the growth in international markets with local economic reforms and incentives. It has been fully integrated into the world, transforming into a more neutral and liberal trade policy. Opening up has contributed to the rapid growth of trade in China which boost the economic growth in China over the four decades.

3.2.2. Turkey

Before opening up in 1980, Turkey was in the appearance of a closed economy with implementing import substitution foreign trade policy as practiced by most of developing countries. By 1980, many reforms are carried out to liberalize economy and foreign trade for integrating with the liberalizing international economy. The main goal of the opening up is to increase export revenues and realize the country's rapid industrialization by strengthening the market economy and minimizing state intervention in the economy. The ineffectiveness of the ongoing economy policies (Kazgan,1988:340) and the desire to benefit from the funds (IMF, World Bank, etc.) provided by the USA and western countries are also among the important factors of the liberalization decision in the economy (Keyder,2004:16).

A radical paradigm shift was made in the economy by making the necessary arrangements with the Economic Program of January 24, 1980. Accordingly, free market forces would be effective in the functioning of the economy with lower state intervention. The strengthening of the private sector meant that the price mechanism was valid instead of administrative decisions in determining the macro and micro balances in the economy. In order to achieve this goal, the policy of intervention in commodity and factor market prices was abandoned.

Also, many incentives were established to increase exports and domestic economy was opened to the world market by liberalizing imports. Due to adopted export-oriented industrialization; tax refund system in exports has been regulated, an incentive fund has been established, the import of intermediate materials to be used for export has been exempted from customs duties, exporters were allowed to hold foreign currency, export facilitating free zones have been established, banks have been obliged to use loans at a certain rate for exports of industrial goods. In addition, public sector, including state-owned enterprises, were narrowed and private enterprise were encouraged. Obstacles to foreign capital were removed and the convertibility of the national currency has been ensured. Also, devaluation of the Turkish Lira and reduction of the budget deficit by minimizing public expenditures are among other regulations (Tokgöz, 2001). The decisions of January 24, 1980 were taken to close the foreign financing deficit to control inflation and to embrace market-oriented economic system more. Therefore, there will be export subsidies in Turkey to increase the exports competitiveness. Initially, high increases in exchange rates, interest rates, and prices of public goods set by the government were accompanied by the rapidly implemented export promotion policy, With the debt relief operation, IMF stand-by and World Bank adjustment loans were rapidly scheduled and their payments were made (TCMB, 2002: 5-6).

One of the critical reforms in Turkey's trade liberalization process is financial liberalization in 1989 in order to contribute to free market mechanism. Most important expectation arising from financial liberalization is the development of financial markets in the country. Because, interventions and pressure on the price and quantity in financial markets harm the development of markets. So, with the elimination of government interventions, the market economy becomes operational in financial markets, and this situation increases domestic savings and constitute a source for investments, and thus economic growth accelerates (Yeldan, 2003:2). As a result of financial liberalization, domestic savings increases and funds growing in financial markets contributes to investment increase and consequently growth by expanding the credit volume. Another important turning point is the Customs Union agreement signed with the European Union in 1996. Turkey thus, became a part of a free trade area among themselves that the common customs tariff applied by the European Union countries remove tariffs.

After the trade liberalization, according to World Bank database, Turkey's exports have increased over the years and have been reached to the level of 157 billion dollars in 2017 from approximately $ 3 billion in 1980. Imports were about 8 billion dollars in 1980. Similar to exports, imports have increased greatly over the years and reached approximately $ 234 billion in 2017. From the perspective of foreign trade balance, it is seen that during the trade liberalization process, import surplus occurs almost every year. This situation caused a foreign trade deficit. Foreign trade deficit has also been a critic factor in the economic crisis experienced in Turkey during the years of trade liberalization.

Trade liberalization, as a part of the process of liberalizing reforms of Turkey's economy, was carried out in the framework of the Stand-By Agreement with the International Money Fund (IMF) in the 1980. As of becoming member in 1947, Turkey has signed around 20 Stand-By Agreement with the IMF. Yet, all agreements before 1980 were for short-term goals and solutions to current economic problems. The 1980 agreement and subsequent 7 agreements (1983,1984,1994,1999,2000,2002,2005) included short-term and long-term goals within the framework of economic liberalization and proposed large-scale policy reforms. The proposed policy reforms exactly coincide with the Washington consensus policy recommendations. Thereby, it can be claimed that Turkey's trade liberalization journey, started and continued under the influence of the IMF policies.

3.3. Empirical Analysis

3.3.1. Data

Variables used in this analysis are the logarithm of real GDP as measurement of economic growth (Constant 2015 US$), logarithm of exports of goods and services (Constant 2015 US$) and logarithm of imports of goods and services (Constant 2015 US$) as measurements of the trade. Analysis uses observations of China and Turkey after opening up that are between 1978 to 2017 for China and 1980-2017 for Turkey. Data is annual and imported from the World Bank database (World Bank, World Development Indicators, 2019).

3.3.2. Methodology

This investigation aimed at analyzing the relationship between trade and growth in terms of causality directions between GDP, exports and imports for China and Turkey after trade liberalization reforms. The reasons for selecting China and Turkey were that 1) these countries adopted the different type of liberalization, 2) they carried out the trade liberalization reforms in close years (1978 and 1980, respectively), and 3) they had close GDP per capita income levels in 2018. The imports, exports, and GDP data of China (1978 -2017) and Turkey (1980-2017) were used. VEC model was applied to investigate the relationship between trade and growth in both countries.

There are many investigations in literature on trade and growth causality directions (Balassa, 1978; Sheehey,1992; Kruger, 1998; Sharer 1999; Thirwall, 2011). Vector Error Correction Model (VEC) are frequently used for this investigation to deepen analysis of causality (Wan and Xie, 2006; Lin and Cao, 2007; Yu and Sun; 2016).

Vector Error Correction Model (VEC)

As a multivariate time series, VEC is a full information maximum likelihood estimation model and provides a more efficient estimator for cointegration vectors that allows a VEC to be tested in a system of all equations in one step without testing the normalization of a given variable. The term cointegration is known as the error correction term as the deviation from equilibrium is gradually corrected in the long run by a series of partial short-term adjustments. VEC builds cointegration relationships to model specification, thus long-term behavior of endogenous variables converges the cointegration relationships and provides short-term adjustment dynamics.

The regression equation form for VEC is as,

$$\Delta y_t = \alpha_1 + p_1 e_1 + \sum_{i=1}^{n} \beta_i \Delta y_t - i \sum_{i=1}^{n} \delta_i \Delta x_t - i + \sum_{i=1}^{n} \gamma_i \Delta z_t - i \qquad \textbf{(1)}$$

$$\boldsymbol{\Delta x_t = \alpha_2 + p_2 e_i - 1 + \sum_{i=1}^{n} \beta_i \Delta y_t - i \sum_{i=1}^{n} \delta_i \Delta x_t - i + \sum_{i=1}^{n} \gamma_i \Delta z_t - i} \qquad \textbf{(2)}$$

where α_1 and α_2 is a constant.

The empirical methodology used in this study requires determining the degree of integration of each variable. Because, time series for economic data is generally stochastic or shows a non-stationary trend, ie the data has a root unit. Various statistical tests are applying for determining the degree of integration of a variable. Augmented Dickey-Fuller (ADF) or/and Philips Perron (PP) unit root tests is used as a part of methods used in this study. Phillips-Perron is a nonparametric alternative method which modifies the augmented Dickey-Fuller test, running the same regression by OLS but calculating different critical points in order to consider the possibility of serial correlation (Hamilton, 1994).

After finding the proper order of integration, next stage is optimum lag selection for VAR model. Schwarz Information Criterion, (SC)Akaike Information Criterion (AIC) or Hannan Quinn (HQ) are the criteria for determination number of lags (orders). VAR model stability is also tested in here before moving to cointegration test stage.

The testing the cointegration relationship depends on stationarity level. If stationarity is found at the first difference level, then necessarily brings to test possibility of cointegration to see the long-term balance between observed variables. Linear connection can provide stationarity when a data individually is not stationary. Then data becomes cointegrated. Johansen test is used for cointegration. Comparing to Engle and Granger's (1987) two-step strategy, procedure of Johansen (1988) is more effective in case of the small sample and the high number of variables. In Johansen procedure, cointegration relationship is seen from the value of trace statistic and max eigen statistic. After run cointegration test, if results show cointegrating relationships, VEC is chosen. if results show no cointegrating relationship, VAR model is the one to be proceed.

As a restricted form of VAR, VEC model defines cointegration relationships in order to nonstationary series. After determination of cointegration in the model, process continues to error correction method. Any integration difference degrees of variables are run jointly between the long-term by error correction equation, thus cointegration variable occurs. The integration degree of cointegrated variables is known Lee and Granger such multi cointegration (Suharsono, Aziza and Pramesti, 2017). After VEC test, VEC Granger Causality test is run to check causal relationships in short term. Then, Impulse Response

Function (IRF) and Variance Decomposition are tested to interpret shocks and response and contribution of variable to each other in parameterized time periods. Finally, tests for Autocorrelation, Normality and Heteroscedasticity are done to check model structure regarding to residuals.

3.3.3. Model Specification and Procedure

In this investigation, VEC model was applied to analysis relationships between trade and growth. Macroeconomic variables mostly are not suitable for policy analysis and forecasting, as they have possibly nonstationary behavior and high persistence. Data must be stationary by using unit root tests that may have an intercept and/or a trend before proceeding to the VEC examination. Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) unit root tests, Granger Causality test and Johansen cointegration test under the broader framework of Vector Error Correction model are used to examine the dynamic relationship between GDP, export and import in both short-term and long-term, to find causality and direction between them. Impulse Response Functions (IRF) and Variance Decomposition are estimated to reveal supply and demand shocks of variables to each other over the time. Econometric calculations are made by using EViews 10 software.

Model specification;

$$\boldsymbol{ln(GDP)_{it} = \alpha_i + \beta_{it}\, ln(EX) + \beta_{it}\, ln(IM) + \varepsilon_t} \qquad (3)$$

The abbreviations for the data used are as follows;

lnGDP = log of GDP

lnEX = log of exports of goods and services.

lnIM = log of imports of goods and services

The empirical methodology used in this study requires determining the degree of integration of each variable. Because, time series for economic data is generally stochastic or shows a non-stationary trend, ie the data has a root unit. Augmented Dickey-Fuller (ADF) or/and Philips Perron (PP) unit root tests were applied for determining the degree of integration of a variable. After finding the proper order of integration, next stage was optimum lag selection for VAR model. Schwarz Information Criterion, (SC)Akaike Information Criterion (AIC) or Hannan Quinn (HQ) are the criteria for determination number of lags (orders). Then, Johansen procedure conducted to determine presence of cointegration vectors in long run. After run cointegration test, results showed cointegrating relationships. Thus, VEC Model was chosen. VEC model defines cointegration relationships in order to nonstationary series for long term, and also short-term estimations. After VEC test, VEC Granger Causality test was run to check causal relationships in short term. Then, Impulse Response Function (IRF) and Variance Decomposition were tested to interpret shocks and response and contribution of variable to each other in parameterized time periods. Finally, tests for Stability, Autocorrelation, Normality and Heteroscedasticity were done to check model structure regarding to residuals.

3.3.4. Summary of Empirical Results

Before proceeding to detailed econometric analysis, in this part, we summarized main findings of empirical analysis. Our investigation was to explore the dynamic relationship between economic growth and foreign trade after trade liberalization reforms for China (1978) and Turkey (1980). We used imports, exports and GDP as variables from the years of 1978-2017 for China and years of 1980-2017 for Turkey. We conducted empirical analysis by applying Vector Error Correction Model to examine the relationships between exports, imports and GDP for both countries. Empirical analysis revealed causal relationships from exports to GDP and from imports to export in China. On the other hand, casual direction goes from both imports and exports to GDP in Turkey. Also, opposite to China, there is causality from exports to imports in Turkey. These findings suggest that exports are engine of GDP growth for both countries after decision of trade liberalization. In addition, imports promote exports growth for China, and it is reversed for Turkey. Another important result that should be underlined among the findings is that imports cause to economic growth in Turkey. Results suggested the inference that imports may simply be consumed, as it does not generate much positive impacts on exports either, only contribute to more imports for Turkey. Yet, China’s imports might have promoted productivity indirectly via exports. This is consistent with findings of Liu (2001) and Tong (1995). Findings were also briefly given in the figures 5 and 6 for China and Turkey, respectively.

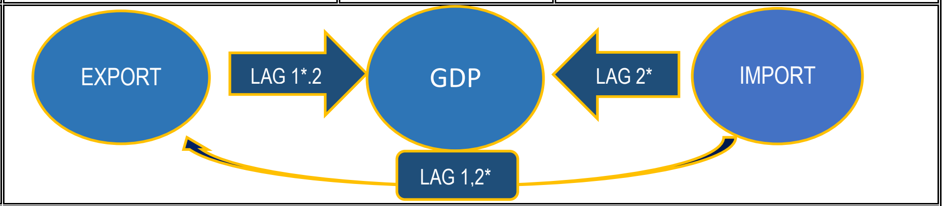
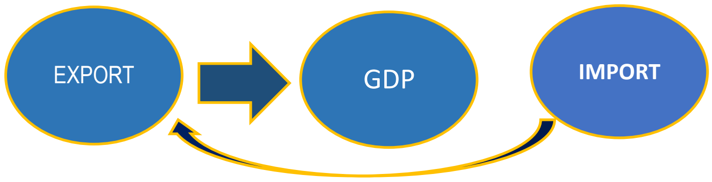
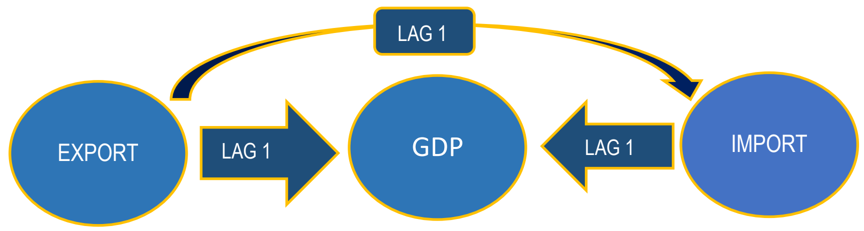
<table>
<tr><th colspan="4">CHINA</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1978-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to export and import shocks are positive, and have significantly increasing trend over time. Moreover, import shocks follow the same path of export shock as just below. GDP shocks start with a positive trend initially then go down below the zero at 5th period. After that GDP shocks become negative on GDP decreasingly by time.
Response of Export to Import and GDP Shocks: GDP shocks have increasing negative effect on export. Import shocks have positive effect on export over the time as following the effect of export shocks trend.
Response of Import to Export and GDP Shocks: Export shocks have significantly increasing positive effect on import as following the effect of import shocks trend. GDP shocks have negative effect on imports increasingly by time.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of export reaches to above 47% by time. Import contributes to around 27% at same time sequence. Export is the main contributor for GDP by 47% over the time with increased contribution from imports.
Variance Decomposition of Export: In EXPORT predicted variance; contribution of GDP increases from 25% to 29% while import contribute up to 11%. Export is the main contributors to itself by 59%.
Variance Decomposition of Import: In IMPORT predicted variance; contribution comes from GDP increases to 20% over the time. Export contribution increases up to 42%. Export and import have the major contribution for import.</td></tr>
</table>

Figure 5. A Glance to Econometric Results for China

<table>
<tr><th colspan="4">TURKEY</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1980-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 2 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests

*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality

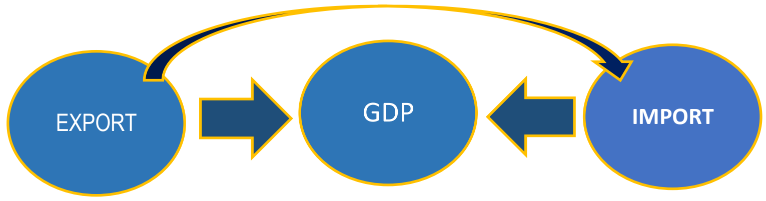
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to export shocks are positive and have significantly increasing trend over time. Import shocks have negative effects on GDP at first periods. Then it follows an increasing trend and becomes positive by 8th period. GDP shocks start with a positive trend initially then fluctuates at similar positive levels.
Response of Export to Import and GDP Shocks: GDP shocks have increasing positive effect on export. Import shocks have similar positive effect trend just below GDP shocks.
Response of Import to Export and GDP Shocks: Export shocks have significantly increasing positive effect on import. Import and GDP shocks have similar positive effect trend on import increasingly by time.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of exports reaches to above 76% by time. Import contributes to around 2% at same time sequence. Export is the main contributor on GDP over the time.
Variance Decomposition of Export: In EXPORT predicted variance; contribution of GDP is around 17% while import contributes up to 3%. Export is the main contributor to itself by 79%.
Variance Decomposition of Import: In IMPORT predicted variance; contribution comes from GDP increases to 20% over the time. Export contribution increases up to 68%. Export has the major contribution for import.</td></tr>
</table>

Figure 6. A Glance to Econometric Results for Turkey

3.3.5. Results and Discussion

3.3.5.1. Unit Root Tests

Macroeconomic variables mostly are not suitable for policy analysis and forecasting, as they have possibly nonstationary behavior and high persistence. Data must be stationary by using unit root tests that may have an intercept and/or a trend before proceeding to the VAR or VEC tests.

At the beginning levels of variables are not stationary which is not rejection of null-hypothesis for both ADF and PP tests. So, first differences of variables are taken to check stationarity at first orders. At this stage, null-hypothesis is rejected as results shown in the table that indicate all series are stationary by integrated of order one I(1) including constant deterministic regressors for China's variables and none for Turkey's variables.

Table 1. Unit Root Test Results

	Variables	**ADF Test Statistics** (1st Difference)	**PP Test Statistic** (1st Difference)	**5% Critical value**	**Deterministic Regressors**	**Results**
CHINA	LGDP	-3.354320	-3.354320	-2.941145	constant	stationary
	LEXP	-5.611715	-5.607797	-2.941145	constant	stationary
	LIMP	-5.497188	-5.510566	-2.941145	constant	stationary
TURKEY	LGDP	-5.762504	-5.797575	-1.950394	none	stationary
	LEXP	-4.814030	-4.845891	-1.950394	none	stationary
	LIMP	-6.154279	-6.191473	-1.950394	none	stationary

3.3.5.2. Optimal Lag Selection

Table 2. Optimal Lag Selection

	Lag	LogL	LR	FPE	AIC	SC	HQ
CHINA	**0**	-10.05082	NA	0.000406	0.705450	0.836065	0.751497
	1	213.4141	398.6130	3.76e-09	-10.88725	-10.36479	-10.70305
	2	266.7483	86.48805	3.46e-10	-13.28369	-12.36939	-12.96136
	3	285.9053	27.95884*	2.06e-10*	-13.83272*	-12.52657*	-13.37224*
	Lag	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
TURKEY	**0**	51.09744	NA	1.39e-05	-2.672080	-2.540120	-2.626022
	1	234.1208	325.3749	8.80e-10	-12.34005	-11.81221	-12.15581
	2	311.9566	125.4022*	1.95e-11*	-16.16426*	-15.24054*	-15.84185*

Lag order determination or optimal lag selection have crucial importance for autoregressive lag polynomial since correct model specification affects all deduces in VAR/VEC model directly. Choosing a higher lag length results with the higher errors in the mean square forecast in the model. On the other hand, lower lag length causes to autocorrelated errrors (Lütkepohl, 1993). Also, there is an inconsistency both of impulse response functions and variance decomposition when the lag length differs from the correct lag length (Braun and Mittnik, 1993).

Even though there is no hard rules about appointing the optimal lag length, Akaike (AIC), Hannan-Quinn (HQ) and Schwarz (SC) are the information criteria are used for determining optimal lag selection. In table 2, Optimal lag lengths are selected based on AIC, SC, HQ and model diagnostics compatibility. These are 3 lag length for China and 2 lag length for Turkey.

3.3.5.3. Johansen Cointegration Test

As a maximum likelihood method Johansen procedure indicates the presence of cointegration vectors and, if any, designates the number cointegration in non-stationary time series VAR model with restricted which is VEC. Under Johansen procedure (Johansen, 1991) two different test statistics are used for defining cointegration: Trace Test and Maximum Eigenvalue Test. The trace test as a joint test tests the null hypothesis *(H0: r=0)* against alternative cointegration hypothesis *(H0: r > 0)*. The Maximum Eigenvalue test performs individual tests on each and every eigenvalue to test the null hypothesis (number of cointegrated vectors is equal to r) versus the alternative hypothesis (*r + 1* cointegrated vectors). Existence of long run cointegration relationships leads to conduct VEC model.

Table 3. Johansen Cointegration Test for China

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. Of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.562041	57.06361	29.79707	0.0000
At most 1*	0.458252	27.34096	15.49471	0.0005
At most 2*	0.136289	5.274627	3.841466	0.0216

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.562041	29.72265	21.13162	0.0024
At most 1*	0.458252	22.06633	14.26460	0.0024
At most 2*	0.136289	5.274627	3.841466	0.0216

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

By running this test, it is checked whether the variables are cointegrated or not, which indicates long-run relationship among them. Johansen cointegration test is run by using logged values of variables. The number of lags is defined based on the criteria that used in VAR model. As seen below, both China and Turkey both have 3 cointegrating equations indicates in trace test at the 0.05 level. But, Max-eigenvalue test indicates no cointegration at the same level for China and 1 cointegrating eqn(s) at the 0.05 level for Turkey. This result refers long-term and stable relationships among the variables.

Table 4. Johansen Cointegration Test for Turkey

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.493734	40.84948	29.79707	0.0018
At most 1 *	0.276393	17.02526	15.49471	0.0292
At most 2*	0.150348	5.702502	3.841466	0.0169

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.493734	23.82422	21.13162	0.0204
At most 1	0.276393	11.32276	14.26460	0.1388
At most 2*	0.150348	5.702502	3.841466	0.0169

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

3.3.5.4. Vector Error Correction Model (VEC)

Cointegration analysis shows that GDP, Exports and Imports have long-run equilibrium relationships for both countries. In this stage, VEC is used for describing both long term and short terms dynamics among the variables. In VEC estimation is done by taking 1 lag less then determined in VAR model since VEC is derivation of VAR model.

Table 5. Vector Error Correction Test for China

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.194806	0.043669	-4.460946	0.0000**
C(2)	0.231965	0.152505	1.521031	0.1319
C(3)	-0.255488	0.132207	-1.932492	0.0566*
C(4)	-1.037033	0.599741	-1.729135	0.0873*
C(5)	1.602300	0.583457	2.746217	0.0073**
C(6)	0.761313	0.564320	1.349081	0.1808
C(7)	-1.012899	0.604884	-1.674534	0.0976*
C(8)	0.045713	0.028266	1.617250	0.1094
C(9)	-0.005229	0.012953	-0.403688	0.6874
C(10)	0.019294	0.045234	0.426531	0.6708
C(11)	-0.043952	0.039213	-1.120846	0.2654
C(12)	1.319910	0.177886	7.419965	0.0000**
C(13)	-0.513550	0.173056	-2.967529	0.0039**
C(14)	0.423495	0.167380	2.530135	0.0132**
C(15)	-0.336911	0.179412	-1.877865	0.0637*
C(16)	0.014860	0.008384	1.772457	0.0798*
C(17)	-0.001574	0.015836	-0.099418	0.9210
C(18)	-0.015417	0.055304	-0.278766	0.7811
C(19)	-0.004763	0.047943	-0.099343	0.9211
C(20)	0.085187	0.217488	0.391687	0.6962
C(21)	0.051847	0.211583	0.245042	0.8070
C(22)	1.389658	0.204643	6.790653	0.0000**
C(23)	-0.632573	0.219353	-2.883812	0.0050**
C(24)	0.011925	0.010250	1.163355	0.2479

	D(GDP)	D(Exports)	D(Imports)
R-square	0.655301	0.945606	0.894401
Log likelihood	60.19062	105.1587	97.72176
Akaike AIC	-2.821114	-5.251821	-4.849825
Schwarz SC	-2.472808	-4.903514	-4.501518

** Significant at 5% level *Significant at 10% level

C(1), C(9) and C(17) are Long Term Cointegration coefficients. VEC Model uses Error Correction Term (ECT) to correct the short terms dynamics errors and restore equilibrium for long run cointegration. It can be simply formulated as follows;

$$\text{Cointegration equation: } Z_{t-1} = ECT_{t-1} = Y_{t-1} - B_0 - B_1 X_{t-1} \quad \textbf{(4)}$$

If adjusted to in the model;

$$\text{Cointegration Equation (Long-run model)} = $$
$$Ect_{t-1} = 1.000*(GDP(-1) + 0.0446578283531*EXPORT(-1) - 0.939087341282*IMPORT(-1) - 4.10536031885 \quad \textbf{(5)}$$

Then, estimated VEC with GDP as target variable:

$$D(GDP)_t=(-0.194806=C(1))*(GDP(-1) + 0.0446578283531*EX(-1) - 0.939087341282*IM(-1) - 4.10536031885) + C(2)*D(GDP(-1)) + C(3)*D(GDP(-2)) +C(4)*D(EX(-1)) + C(5)*D(EX(-2))+ C(6)*D(IM(-1)) +C(7)*D(IM(-2)) + C(8) \quad \textbf{(6)}$$

As the seen in the equation, long term and short-term dynamics have coefficients of variables nominated with C from the VEC table. Also, p-values (prob) show whether coefficients statistically significant or not. Regarding of the this C(1) has negative coefficient and *p*-values below the 0.5% which indicates in long run cointegration of GDP, Exports and Imports are statistically significant as GDP dependent variable. So, in long term export has positive and import have negative Granger causal impacts on the China's GDP by their value of coefficients. On the other hand, there are no statistically significance in the long run equilibrium that Imports or Exports are dependent variables shown in Equations 2 and Equation 3 from the VEC estimations table.

Figure 7. VEC Short- Run Causal Relationships for China by Lags

In short term, Export lag 2 has significant causal effect on GDP by p-values in 0.05% significance level, and Import lag 2 and Export lag 1 have weak causal effect on GDP as shown in the table. In addition to this, import lag 1 has significant causal effect on Export and Import lag 2 has relatively weak causal effect on Export by above 0.05% but below 0.1% at significance level. The short-term causal relationships are drawn table.

Table 6. Vector Error Correction Test for Turkey

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.127640	0.027460	-4.648281	0.0000**
C(2)	0.805523	0.087315	9.225520	0.0000**
C(3)	0.557722	0.116747	4.777168	0.000**
C(4)	-0.276443	0.124713	-2.216639	0.0291**
C(5)	-0.015182	0.006234	-2.435377	0.0168**
C(6)	0.004754	0.035688	0.133204	0.8943
C(7)	-0.132553	0.113478	-1.168099	0.2458
C(8)	0.898374	0.151730	5.920889	0.0000**
C(9)	0.114630	0.162082	0.707233	0.4812
C(10)	0.003086	0.008102	0.380858	0.7042
C(11)	-0.021135	0.037738	-0.560062	0.5768
C(12)	0.073994	0.119996	0.616641	0.5390
C(13)	0.379347	0.160445	2.364348	0.0201**
C(14)	0.659130	0.171392	3.845750	0.0002**
C(15)	-0.011591	0.008567	-1.352933	0.1794
	D(GDP)	**D(EXPORT)**	**D(IMPORT)**	
R-squared	0.918616	0.78826	0.846162	
Log likelihood	101.7073	92.27220	90.26160	
Akaike AIC	-5.372631	-4.84845	-4.736755	
Schwarz SC	-5.152697	-4.628523	-4.516822	

*** Significant at 5% level* **Significant at 10% level*

Estimated VEC with the GDP as target variable is following;

$$D(GDP) = C(1)*(GDP(-1) - 0.891365261045*EX(-1) + 0.118333937473 *IM(-1) - 7.38805383414)) + C(2)*D(GDP(-1)) + C(3) *D(EX(-1)) + C(4)*D(IM(-1)) + C(5) \quad \textbf{(7)}$$

C(1), C(6) and C(11) are Long Term Cointegration coefficients. Long term and short-term dynamics have coefficients of variables nominated with C and p-values from the VEC table. Regarding of the this C(1) has negative coefficient and p-values below the 0.5% which indicates in long run cointegration of GDP, Exports and Imports are statistically significant as GDP dependent variable. So, in long term export has negative and import have positive Granger causal impacts on the Turkey's GDP by their value of coefficients. On the other hand, there are no statistically significance in the long run equilibrium that Imports or Exports are dependent variables as seen in Equations 2 and Equation 3 from the VEC estimations table.

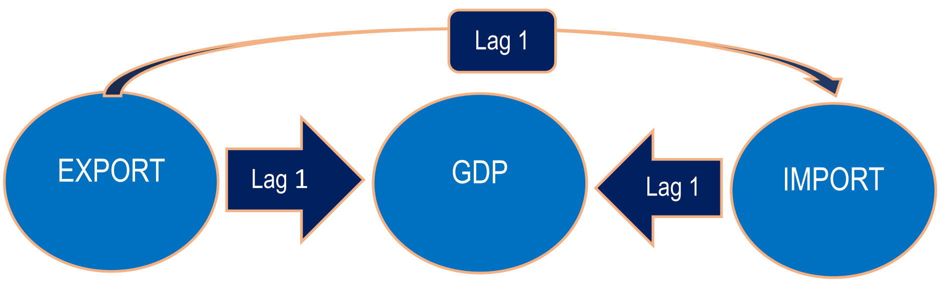


Figure 8. VEC Short- Run Causal Relationships for Turkey by Lags

In short term, Export lag 1 and Import lag 1 have significant causal effect on GDP. As seen on the table p-values below 0.05%. Export lag 1 also have relatively weak granger causal effect on the Import at 0.10 % of significance level.

3.3.5.5. VEC Granger Causality Test

Table 7. VEC Granger Causality/Block Exogeneity Wald Tests for CHINA

Null Hypothesis, H0	chi2	Prob > chi2	H_0
lnGDP does not granger cause on lnExport	1.265409	0.5312	Accept
lnGDP does not granger cause on lnImport	0.114402	0.9444	Accept
lnExport does not granger cause on lnGDP	**8.749235**	**0.0126**	**Reject****
lnExport does not granger cause on lnImport	1.306576	0.5203	Accept
lnImport does not granger cause on lnGDP	2.827396	0.2432	Accept
lnImport does not granger cause on lnExport	**6.401678**	**0.0407**	**Reject****

As it is seen from the table, changes in the growth rate of GDP are granger caused by the growth rate of Export but is not caused by the growth rate of Import at %5 significance level. Also, another casual relation is from Import growth to Export at %5 significance level. So, causality comes from Export to GDP and Import to Export for China.

Table 8. VEC Granger Causality/Block Exogeneity Wald Tests for Turkey

Null Hypothesis, *H0*	chi2	Prob > chi2	H_0
lnGDP does not granger cause on lnExport	1.364455	0.2428	Accept
lnGDP does not granger cause on lnImport	0.380246	0.5375	Accept
lnExport does not granger cause on lnGDP	**22.82133**	**0.0000**	**Reject****
lnExport does not granger cause on lnImport	**5.590141**	**0.0181**	**Reject****
lnImport does not granger cause on lnGDP	**4.913488**	**0.0266**	**Reject****
lnImport does not granger cause on lnExport	0.500178	0.4794	Accept

Table 8 shows the result VEC Granger causality test results for Turkey. According to test results; both Export and Import have granger causal effects on the GDP. Besides this, Export has also causal impact on Import which contradicts to China’s result. Direction of causality between export and Import is from Import to Export for China.

3.3.5.6. Impulse Response Function (IRF)

Impulse Response function (IRF) defines the reactions of the system as a function of time and other independent variables. IRF explains the system dynamic behaviors by parameterizing it. Following figure show the IRF functions for China (left) and Turkey (right).

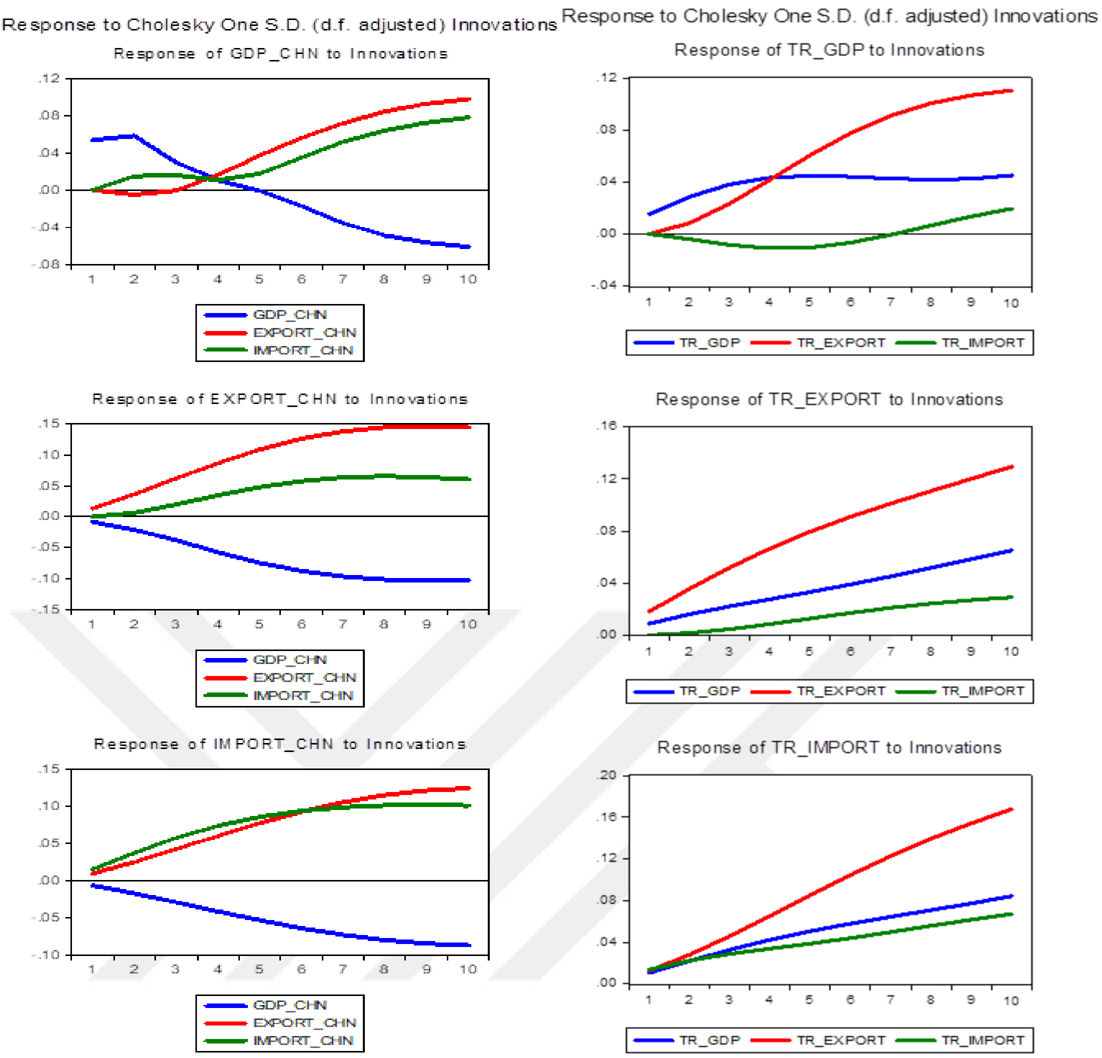


Figure 9. Impulse Response Functions of China (Left) **and Turkey** (Right)

For China, it seems that GDP doesn't respond significantly to shocks in export at first 3 time periods. By 4th period, GDP shows positive response increasingly until 10% increases for every shock in export. In terms of import shocks, GDP gives positive response to imports shock at first period. More specifically; GDP increases by 0.02% while 0.01% increase in imports. After that, response of GDP keeps similar response until 5th time periods, Then, response of GDP increases to 0.08% increases to every percentage change in import. Response of GDP to GDP shocks goes down until 0.06% decreases right after first two periods of 0.06% increase. Responses of export to shocks in import and export goes up increasingly over time until 0.05% and 0.15%, respectively. Yet, shocks in GDP have negative effects in exports by time. Response of import to export shocks goes up by time to reach 0.12% increase to every percentage shock in export. In addition, response of import to shocks in imports has similar trend by reaching 0.10%. Shocks in GDP have negative effects in imports by time.

For Turkey, IRF shows that export shocks have increasingly positive effect on GDP over the time periods up to 0.12% increase. Response of GDP to imports shocks is negative until 8th time period. Then, response of GDP becomes positive to every percentage change in import up to 0.02% increase. Shocks in GDP increases GDP from 0.01% to 0.04% until 4th period. Then, it halts in close range to 0.04% over the time. Export responses to shocks in GDP, import and export keep similar increasing trend with different volumes over the time periods. In other words, shocks in export cause increase in export with the response of until 0.12%, shocks in GDP causes increase until 0.06% and shocks in import causes increase until 0.02% in exports as a response to every percentage change in variables. Responses of import are positive and increasing trend. Shocks in export brings increases in import until 0.16% over the time. Shocks in GDP and import have also positive impact on import increasingly up to 0.08% and 0.06%, respectively.

Overall, in terms of imports impacts on GDP; China's imports enhance GDP growth significantly. Since import does not granger cause GDP growth in China, it suggests that China's imports might have promoted productivity indirectly via exports. Yet, it is not case for Turkey. Import has granger cause on GDP growth in Turkey and IRF shows that shocks in import doesn't accelerate Turkey's GDP. It can be suggested that imports may simply be consumed, as it does not generate much positive impacts on exports either, only contribute to more imports. Moreover, impacts of GDP shocks on exports and imports are both negative for China and both positive for Turkey. It means GDP promotes trade in Turkey but, it is not case for China.

3.3.5.7. Variance Decomposition

Variance Decomposition as a mean square errors decomposition refers the percental amount of information about contribution of variables to each other as short and long terms effects in the autoregression at chosen time horizons. Following figure shows variance decomposition results for China (left) and Turkey (right)

Figure 10. Variance Decomposition for China (Left) **and Turkey** (Right)

For China, according to Figure 8 (left), in GDP predicted variance, GDP contribution to itself change starts to gradually decrease from the first period, goes down to around 24% in the tenth period, export contribution to GDP starts in the third period and reaches to around 48% in the tenth period. Meanwhile, import contribution reaches to around 27% to GDP in same period by starting to contribute at second period more than export until 6th period. Variance decomposition of export shows that export has 75% of contribution to itself at first period while GDP contribution is 26%, then goes down to around 60% in the 10th period when GDP increases to around 28%. On the import side, 2% ratio at 2nd period rises to 11% in same period. Decomposition of import at first period reveals contribution shares as 10% of GDP, 26% of export and 63% of import. By 10th period, share of GDP increases to 20%, export rises to 42% and import declines to 37%.

For Turkey, according to figure 8 (right), contribution GDP to itself starts with 100%at first period and constantly decreases to 22% by 10th period. Exports contributes 6% by 2nd period and rapidly increases to 76% by 10th period. Contribution of import to GDP fluctuates over time and decreases to 1% by 10th period whilst reaches 3% in the 4th period. Variance decomposition of export shows that contribution of export to itself starts with 80% and fluctuates after a brief increase and comes to same level again at beginning. GDP contribution to export starts with 19% in the 1st period and after slow drop to 14% in the 5th period goes up to 17% throughout the periods. On the other hand, import contribution to export stays under 1% until 5th period and slowly rises to 3% by the 10th period. For predicted variance of import, contribution of import declines constantly from 40% in the first period to 12% in the 10th period whereas contribution of exports rises rapidly from 34% to 68% over the same time periods. GDP contributes to import by 24% in the 1st period and gradually decreases until 19% by 10th period.

Overall, variance decompositions of GDP, export and import variables for both countries emphasize the importance of import. China's import contributes to GDP and export increasingly over time which is not case for Turkey. There is no significant contribution to both GDP and export in Turkey by import. This conclusion supports the suggestion previously pointed that China's import promotes the China's GDP via exports.

3.3.6. Model Diagnostics

Model diagnostics are tested to specify the model correctly and prevent spurious results. Model misspecifications occur caused by unstable parameters and conclude to bias estimates. Stability,Autocorrelation, Normality test and Heteroskedascity are tested due to model diagnostics.

3.3.6.1. Stability Test

To ensure the residual stability of VEC model, AR Roots stability test is checked. If all polynomial roots values are below one, in other words, if all roots are within the circle, VEC model is accepted to be stable. Following graphs shows that all roots are within the circle for both China and Turkey. It means that the VEC models are stable for both countries.

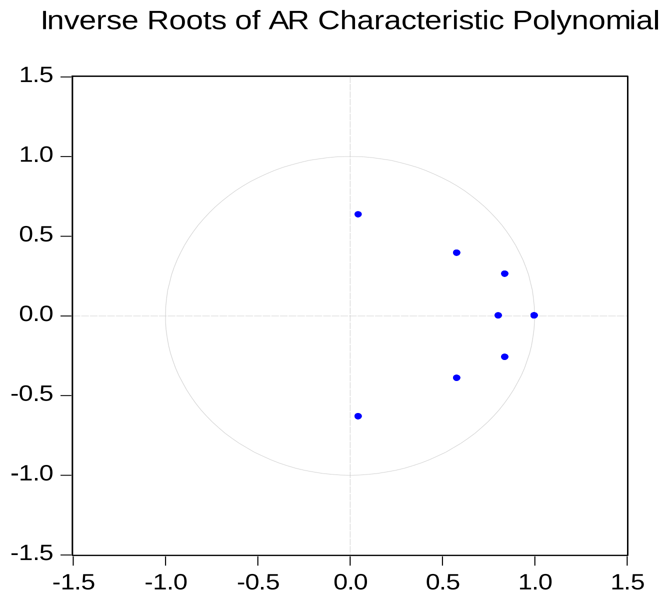


Figure 11. Inverse Roots of AR Characteristic Polynomial for China

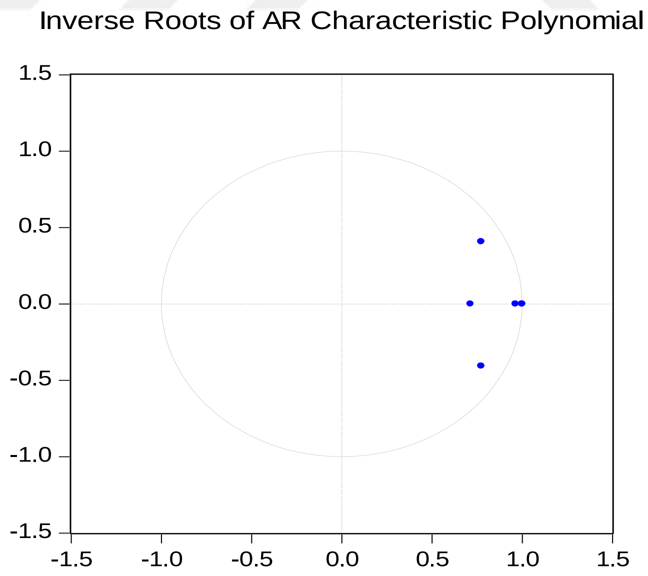


Figure 12. Inverse Roots of AR Characteristic Polynomial for Turkey

Model diagnostics are tested to specify the model correctly and prevent spurious results. Model misspecifications occur caused by unstable parameters and conclude to bias estimates. Autocorrelation, Normality test and Heteroskedascity are tested due to model diagnostics.

3.3.6.2. Autocorrelation Test

Autocorrelation comes into view whereas the observations have a natural sequence. VEC Residual Serial Correlation LM Tests are tested for both China and Turkey's VEC models. For China, LM- Statistics show that lag 1, lag 2 and lag 3 have p-values of 0.4144, 0.0550 and 0.0720, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5% or 1% level of significances. For Turkey, LM-Statistics show lag 1 has 0.0539 p-value and lag 2 has 0.5113 p-value. It also brings the point same drawn in test for China that there is also no existence of autocorrelation in terms of critical value at 5% or 1% level of significances. In conclusion, There is no issue of autocorrelation for both countries tests.

3.3.6.3. Heteroscedasticity Test

Heteroscedasticity comes out whereas the variance of random error terms (error term) in the model is not constant (same, homo) for different observations of the population by time. VEC Residual Heteroskedasticity test is used for detect heteroscedasticy for both China and Turkey's models. Test result indicates absence of heteroscedasticity in the both models. Test results of model for China confirm that with a chi-square value of 97.71233 and a p-value of 0.1455. Results of model for Turkey confirm with chi-square value of 47.86079 and a p-value of 0.4785. Both models have greater p-values than the critical values at 5% significance level which it makes sure of VEC models reliability.

3.3.6.4. Normality Test

Normality test is used to determine if sample data is drawn from a normally distributed population. VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Both Jarque- Bera component and joint test results show that all p-values are higher 0.05% significance level which indicates sample data is normally distributed of model for China. P-values results for component 1, component 2, component 3 and joint test are 0.4234,0.7220,0.2029 and 0.4742, respectively. All values are significantly higher than 0.05% level of significance. For sample size of model for Turkey confirms that all component and joint tests have higher p-values than 0.05% significance level which are 0.9920, 0.9853, 0.8358 and 0.9988, respectively. That also confirms that sample size is normally distributed for model of Turkey. Both countries are confirmed regarding of the normality tests.

3.4. Descriptive Analysis

In the previous section, econometric relationship between export, import and GDP was tested for both China and Turkey. In this section, interdependencies of export and import were scrutinized by using Trade in Value Added (TIVA) indicators from Organization for Economic Co-operation and Development (OECD). This was conducted to examine previous econometric findings and understand relationship between imports and exports in terms of production segmentation.

3.4.1. Trade in Value-Added Analysis (TIVA)

Trade in Value Added (TIVA) defines a statistical methodology to offer new perspectives on trade relations between countries and provide a wide and deepen information of where value is created at every stage of the global value chains (GVCs). With the globalization, production diversifies all over the world. Hence, conventional trade statistics may not create an accurate perspective to evaluate importance of the trade to economic growth. As Maurer points out that "what you see is not what you get" (Maurer and Degain, 2010). The TIVA approach, which draws a more detailed picture from the basic trade measures at the macro level, offers the higher contribution of services in GVCs, the imports' role in export performance and the detailed form of economic dependencies among the countries (OECD, 2018).

3.4.2. Conceptual Framework

This conceptual framework has been compiled from the "Trade in Value Added: Concepts, Methodologies and Challenges" note of the OECD and WTO in 2012 (OECD, W.,2012):

By ignoring subsidies and taxes to create simplicity, conceptually it can be decompose any kind of product generated in country *i* as the value-added within value of V^p , then its total value (OECD,W., 2012: P.9):

$$V^p = \sum_i VA_i^p \tag{8}$$

Let's describe consumer and producer relation as a function in the framework of an input-output (P.10):

$$g = A * g + y \tag{9}$$

Here;

g: is representation of $n*1$ output vector from n industries in such economy.

A: defines $n*n$ matrix that gives description the interrelationships of industries (technical coefficients matrix); therefore, a_{ij} represents inputs ratio in the domestic industry i embodied in any output from industry j.

y: defines $n*1$ final demand vector for goods as produced in the domestic market and services within exports.

Assuming homogeneity of all goods produced in a specific industry, total imports are built directly and indirectly in exports, then additional activity due to the additional production in domestic market can be estimated as (P.10):

$$\boldsymbol{Import\ content\ of\ exports} = \boldsymbol{m * (1 - A) - 1 * e} \tag{10}$$

here:

m: is a $1*n$ vector with components m_j (the ratio of imports to output in industry j)

e: is a $n*1$ vector of exports by industry.

Likewise, the total indirect and direct contribution of exports to value added can be estimated by replacing import vector m from above with an equivalent vector representing the ratio of value added to output (v). Thus, export contribution in total value added in the economy is equal to (P.10):

$$v*(I-A)-1*e \tag{11}$$

Suppose is α an international matrix of technical coefficients whose dimensions are defined as $(n * c) * (n * c)$, where c represents the number of countries and n defines the number of sectors. Also, assuming structure of the table defines that rows *1* ton reflection of the country *1*’s industries and rows $n + 1$ to $2n$ country *2*'s industries, thus continues. Then, v_i^k represents direct added value created in the country k by the industry i as percentage of total output. Thus, direct and indirect total domestic added value generated by sector j in country k is shown (P.11):

$$\Sigma_i v_i^k * L_{(kn+i)(kn+j)} \qquad \textbf{(12)}$$

where: L_{ij} is the *ij*th element of the global Leontief inverse $(I\text{-}\alpha)^{-1}$
Simirlarly,

$$\Sigma_i v_i^k * L_{(hn+i)(hn+j)} \qquad \textbf{(13)}$$

represents the total added value produced in country k within each unit of output in industry j of country h

$$v_i^k * L_{(hn+i)(hn+j)} \qquad \textbf{(14)}$$

creates a mechanism that defines the contributions within different sectors of the economy and represents the value-added that industry i in country k produces for the output unit of industry j.

Thus, any export generated by industry can be decomposed to the its entire value (P.11):

(i) domestic value added in its production can be from the main producer industry directly and through domestic and foreign industries indirectly; and

(ii) imported value added in producing imports built in production (excluding domestic value added in the import value)

3.4.3. Summary of Trade in Value Added Analysis

Trade in Value Added (TIVA) approach, which draws a more detailed picture from the basic trade measures at the macro level, offers the higher contribution of services in GVCs, the imports' role in export performance and the detailed form of economic dependencies among the countries (OECD, 2018).

The TIVA indicators used in this study were compiled from the latest TIVA report published by the OECD in December 2018 which includes 36 industrial sectors for 64 countries between the years of 2005 to 2015. It combines nature of indicators regarding to value-added origins of imports, exports and final demand for countries and industries.

In this study, China and Turkey indicators are elaborated to reveal value-added relationships between export and import.

Table 9. Trade in Value-Added Summary View for China and Turkey

<table>
<tr><td colspan="4">TRADE IN VALUE-ADDED
SUMMARY VIEW (2005 - 2016)</td></tr>
<tr><td colspan="2"></td><td>CHINA</td><td>TURKEY</td></tr>
<tr><td colspan="2">Import Content of Gross Exports

(% of total gross exports)</td><td>26.3% (2005)
Above averages (OECD, EU28, G20)

16.6% (2016)
Below averages (OECD, EU28)
Similar to average of G20</td><td>15.4% (2005)
Below averages (OECD, EU28, G20)

16.5% (2016)
Below averages (OECD, EU28)
Similar to average of G20</td></tr>
<tr><td colspan="2">Domestic Value-Added in Foreign Final Demand
(% total value-added)</td><td>23.5% (2005)
16.7% (2015)</td><td>18.2% (2005)
20% (2015)</td></tr>
<tr><td colspan="2">Imported Intermediate Inputs Used for Exports
(% of total Intermediate imports)</td><td>42% (2005)
30% (2015)</td><td>25% (2005)
30% (2015)</td></tr>
<tr><td colspan="2">Services Content of Gross Exports
(% of gross exports)</td><td>29% (2005)
35% (2015)</td><td>51% (2005)
51% (2015)</td></tr>
<tr><td rowspan="3">Main Trade Partners</td><td>Exports</td><td>USA, Japan, Korea, India, UK</td><td>Germany, USA, UK, Russia, France</td></tr>
<tr><td>Imports</td><td>USA, Korea, Japan, Taiwan, Germany</td><td>China, Germany, USA, Russia, Italy</td></tr>
<tr><td>Domestic Value-Added Content of Manufactured Imports

(% of total value-added (VA) built in imports)</td><td>Korea, Taiwan, Malaysia, Japan, Thailand</td><td>Germany, Italy, Bulgaria, Spain, France</td></tr>
</table>

Source: OECD, 2018

3.4.4. China

3.4.4.1. Overview

Before going into the details of the trade in value-added indicators, it is useful to briefly mention a few of the conclusions that are also highlighted in the latest TIVA report (OECD, 2018) in order to frame the transformation of China's trade over the years.

To start with a general framework, it is seen that there is a structural shift in the Chinese economy from manufacturing-led export growth towards domestic supply and consumption with an economy in which the role of services increases. The indicator of import content of exports herein 'foreign value-added content of gross exports' of China decreases from above OECD average and EU28 average in 2005 and comes to similar to the G20 average by 2016. Also, the most important trading partners of China are the USA, Japan and Korea in terms of both gross and trade added value. In addition, the intensity of China's integration with some regional trading partners such as Vietnam, Mexico, Cambodia, Malaysia and Hong Kong have increased significantly in recent years.

To proceed with the changes of some indicators between the years of 2005 and 2015 or 2016 provide a perspective on the details of interdependencies of China's export and import which is planned to scrutinize in this study (Especially, in terms of foreign value-added content of China's exports and China's domestic value-added content driven by foreign final demand). Firstly, as a measure of import content of export, foreign value-added content of export for China decreases to 16.6% in 2016 while it is 26.3% in 2005. Decline in total manufactures indicates a possible shift in sourcing of intermediate good to domestic area. Secondly, similar downtrend occurs in the share of China's domestic value-added content driven by foreign final demand between the years of 2005 (23.5%) and 2015 (16.7%). The proportion of imported intermediate inputs built in exports has significant decrease from 41,8% in 2005 to 30.3% in 2015. It suggests that face of China’s production turns to domestic consumption away from foreign final demand.

The downward trend in Tarde value-added indicators is not applicable to the services content of China's gross exports. On the contrary, from 2005 to 2015, there is an increase from 29% to 35%. Besides, the role of services (30%) becomes more important to China’s manufacturing competitiveness by 2015 while it is 24% in 2005.

3.4.4.2. Import Content of Gross Exports

As seen in Figure 13, the indicator of import content of exports herein ‘foreign value-added content of gross exports’ of China decreases above OECD average to similar to the G20 average following a short rise right after 2008 financial crisis. Despite this steady downward trend of China, averages of OECD, G20 and EU28 changes are seen to continue on a more horizontal route close to their previous values with the slight declining trend observed in recent years. This also means that the integration of global value chains has slight declining.

China's foreign content of exports, which is 26.3% in 2005, goes to 16.6% with a decrease of 9.6% in 2016. This is below averaging of OECD, EU28 and similar to G20 average levels. However, in 2005, China has a relatively higher foreign content of exports ratio. This is understandable, given the size of the Chinese economy and the stable trend of its exports and economic growth. Because, the local supplier pool, which is growing over time, and technological development in domestic market reduces the import value of China in exports.

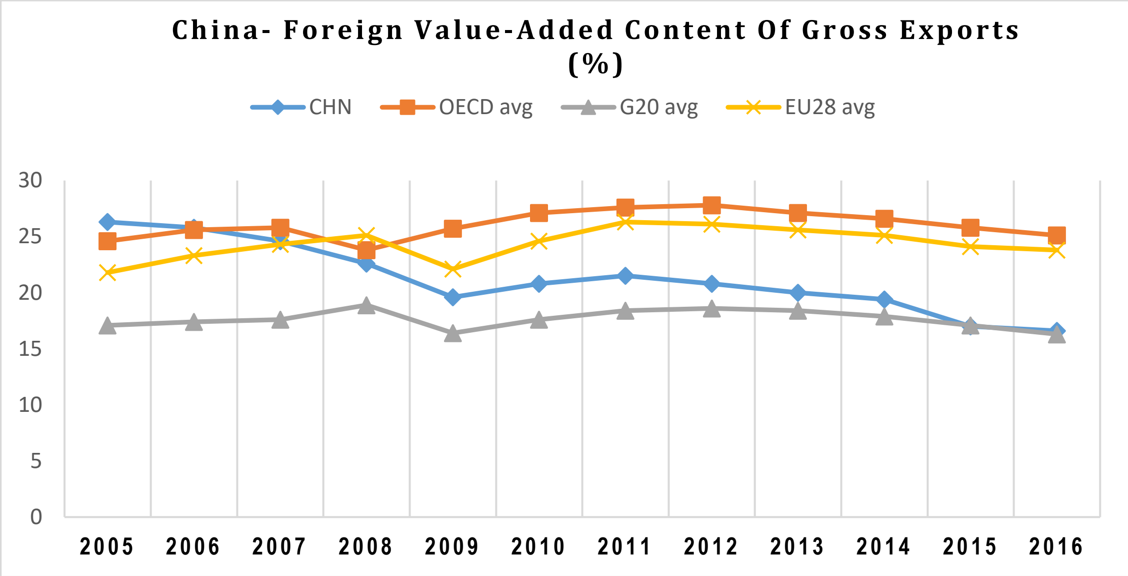


Figure 13. China - Foreign Value-Added Content of Gross Exports

Note: As a percent of total gross exports, 2005 to 2016

Source: OECD, 2018

3.4.4.3. Domestic Value-Added in Foreign Final Demand

The first column in Figure 14 shows that total contribution of the domestic value added (DVA) to foreign final demands in other words abroad consumption, which is 23.5% in 2005, decreases to 16.7% in 2015. This situation has possibility to be explained by the fact that China gains the ability and market power to produce some part foreign final demands in domestic market. Second and third columns show total manufactures and total services, respectively. Domestic value added in foreign demands for total manufactures decrease around 10% from below 40% to below 30% by the years of 2005 and 2015 in chronological order. On the other hand, decrease of total services is quite less between 2005 and 2015.

In terms of the distribution of shares according to the industries, the top ratios are ICT and electronics (55.3%), and Textile and apparel (50.8%), while the lower rates are Food products and accommodation & food with the shares of less than 10%. Moreover, the downward trend in high-rate industries between 2005 and 2015 is higher than in low-rate industries.

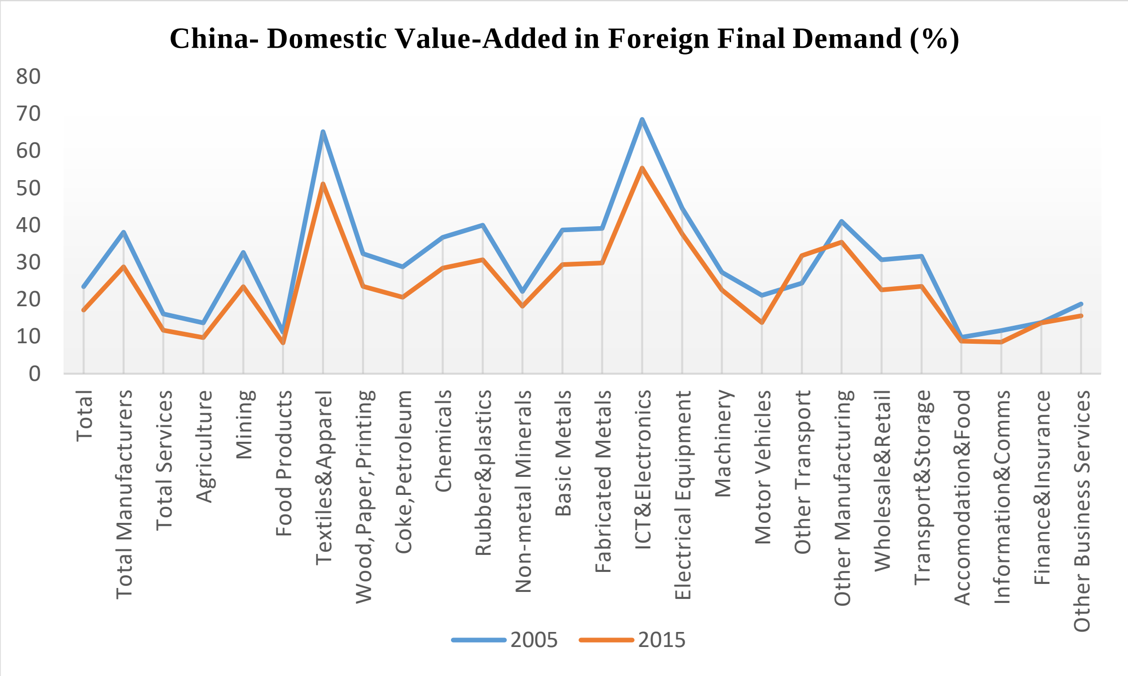


Figure 14. China - Domestic Value Added in Foreign Final Demand

Note: As a percent of value added by industry, 2005 to 2015

Source: OECD, 2018

3.4.4.4. The Importance of Imports for Exports by Industry

Foreign value-added content difference of total gross export has around 10% decrease from 2005 to 2015. Figure 15 shows that this decrease in size is higher in total manufactures compared to total services. Also, in terms of industries, Coke and Refined Petroleum products (35%) and ICT and Electronics (30.5%) share high portions than other industries by 2015 as same in 2005. Besides, the downtrend that occurred from 2005 to 2015 applies to almost all industries.

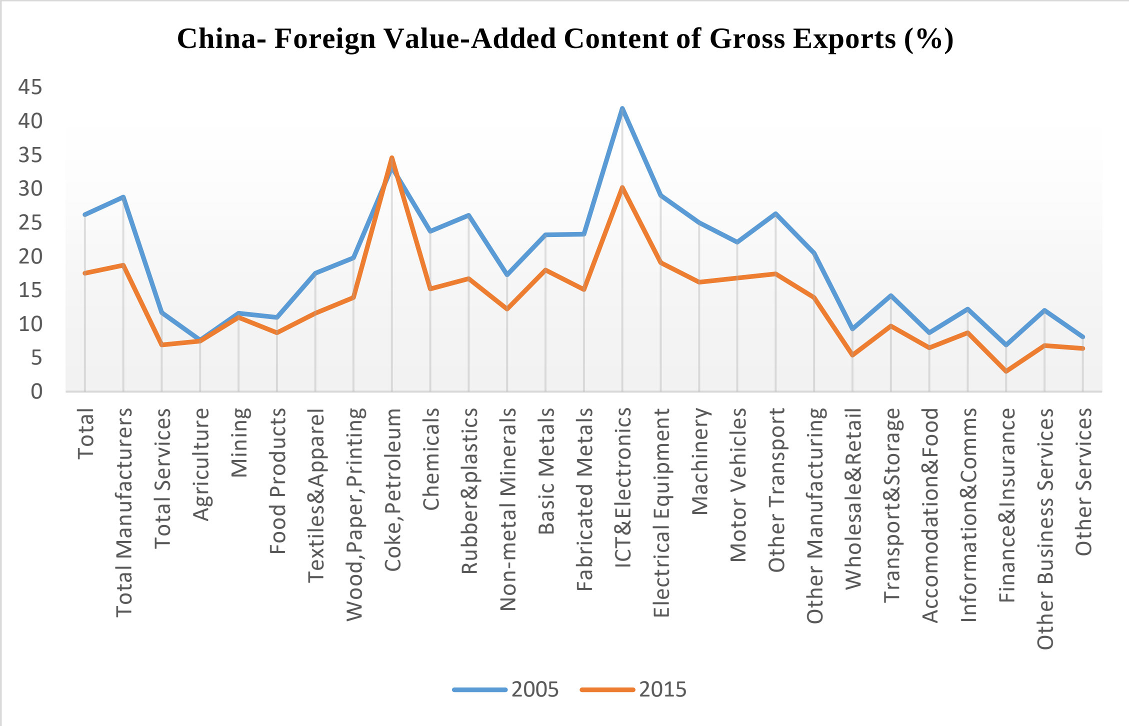


Figure 15. China - Foreign Value-Added Content of Gross Exports

Note: As a percent of gross exports, by industry, 2005 and 2015

Source: OECD, 2018

In comparison with domestic and foreign value-added content of total exports by industry shares, domestic value-added contribution of total exports has major distribution. According to the distribution of 2015, the largest source of domestic value-added export contents are ICT and electronics (15.6% of gross exports), Textiles and apparel (12.2%) and Electrical equipment (7.8%). On the other side, ICT and electronics (6.8%) has most foreign value-added content in total exports, followed by Electrical equipment and Textiles and Apparel (Figure16).

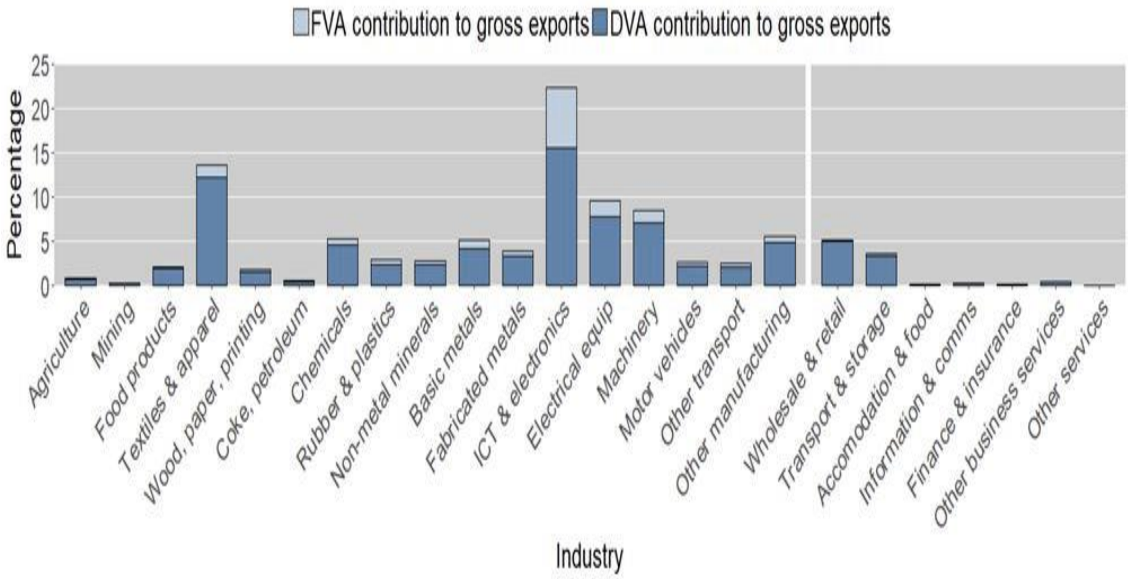


Figure 16. China - Foreign and Domestic Value-Added Content of Gross Exports by Industry Shares

Note: As a percent of total gross exports, 2015

Source: OECD, 2018

Figure 17 shows industry origin of imports as intermediate inputs which subsequently built-in exports. Imported intermediate input used in total exports has significant decrease from 41,8% in 2005 to 30.3% in 2015. A similar decline is observed for the total manufactures industries and total services. ICT and Electronics, Textiles and Apparel and Electrical Equipment have largest shares of intermediate imports built in exports of China by the 52.5%, 43.3% and 32.8% in 2015, respectively.

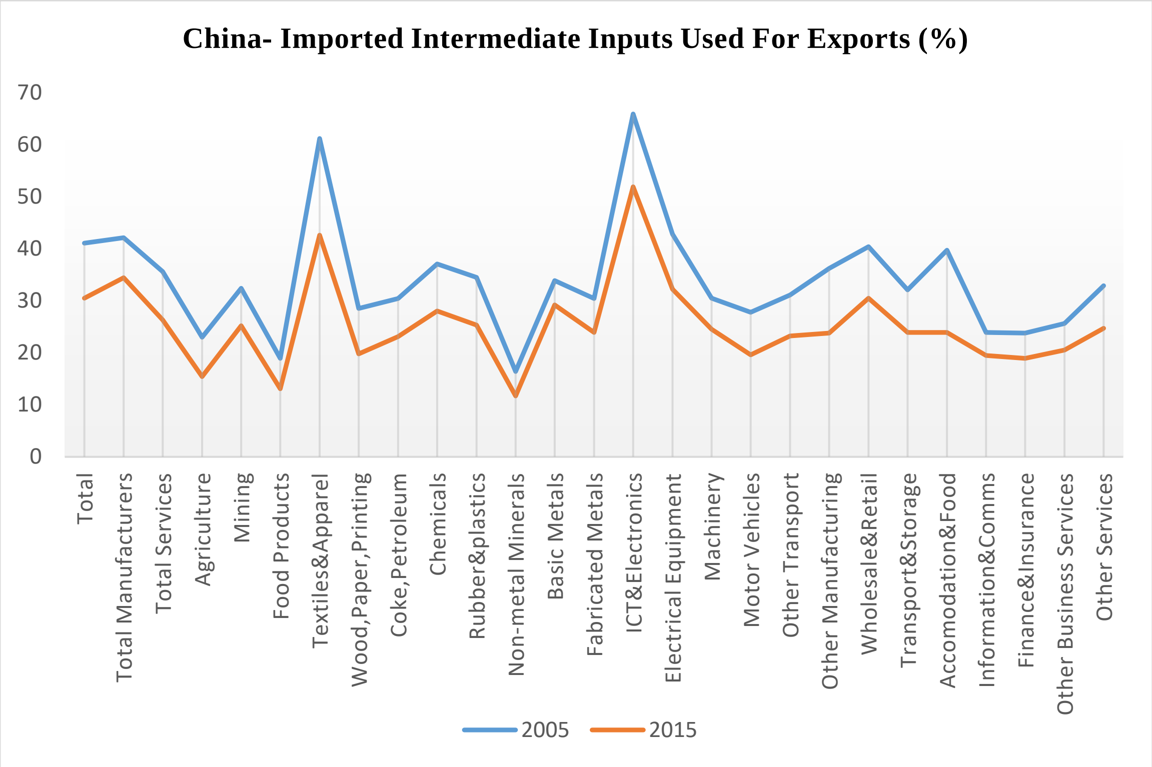


Figure 17. China - Imported Intermediate Inputs Used for Exports, by Industry-Origin of Imports

Note: As a percent of intermediate imports, 2005 and 2015

Source: OECD, 2018

3.4.4.5. Services Content of Gross Exports

Services, which accounted for 34.8% of China's gross exports in 2015, makes an increasingly important contribution to the China's economy as seen in Figure 18, even though this is significantly lower than 54% of the OECD average. Compared to 2005, the contribution of services to exports increases in all industries in 2015. This improves manufacturing competitiveness. Services value-added content has 29,7% shares in Total Manufactures exports by 2015. ICT and Electronics, Electrical Equipment, Rubber and Plastics, Electrical Equipment and Machinery are the industries have the biggest shares over 30% close each other (OECD, 2018).

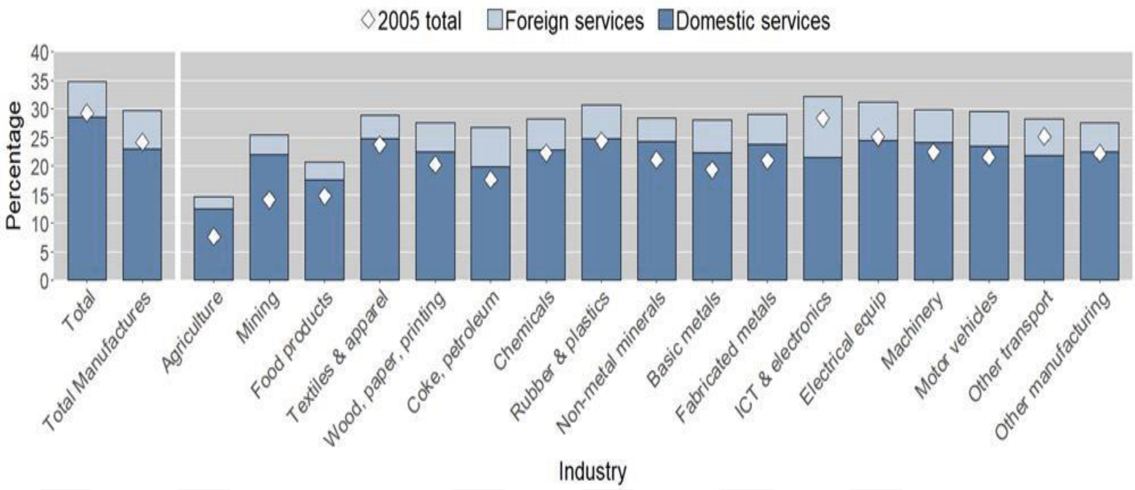


Figure 18. China - Services Content of Gross Exports

Note: As a percent of gross exports by industry, 2015

Source: OECD, 2018

3.4.4.6. Main Trade Partner Countries for China

United States (USA) has a special place in China's growing foreign trade journey over the years. According to data of 2015, USA is China's biggest partner in terms of both trade size and value-added trade content as seen in Figure 19 left and right. USA, Japan and Korea are leading China’s export market regarding to share of total gross export by 22.3%, 7.9% and 5.1%, respectively. USA (24.8%) and Japan (8.1%) are also in the top for final destinations of China’s value-added exports which India is in the third rank by 3.7%.

USA, Japan and Korea are also top main partners of China for imports in gross terms and value-added terms. For gross import side, USA is first by taking the share of 12,6% from total. Korea is second by 10.9% and Japan is third by 8.6%. For value-added side, once again USA takes first place by 14.9% followed by Japan (9%) and Korea (7.2%). Figure 17 also shows that in terms of total gross and value-added content of exports and imports, China's main partner countries are some top developed and largest economies in the world.

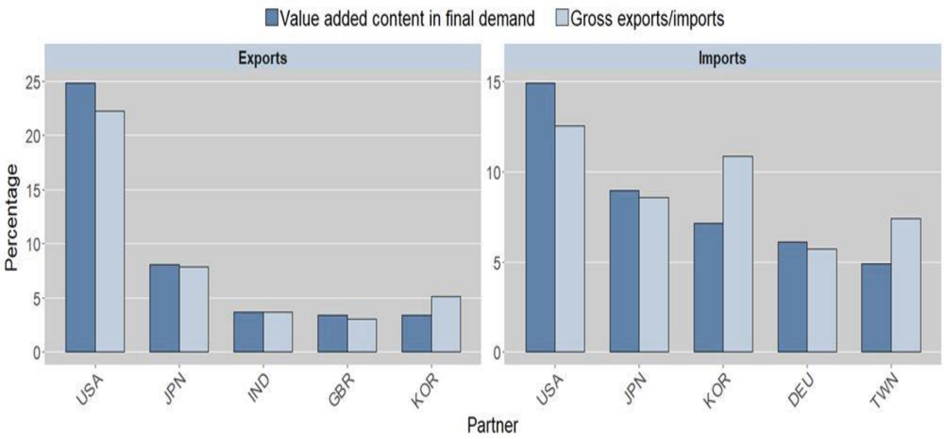


Figure 19. China - Exports to and Imports from Main Partner Countries

Note: As a percent of total gross and value-added exports and imports, 2015

Source: OECD, 2018

From the point of highest share of China's total value-added embodied in imports, in 2015 Korea takes highest share from China's import by 31.2%. Chinese Taipei takes second by 15.8% and Malaysia takes third by 8.7% of total (Figure 20, left). On the other hand, main partners of China which have highest share of China's value-added in manufactures in their export to China mainland are Vietnam (16.3 %), Mexico (14.9 %), and Cambodia (11.3 %) by 2015 (Figure 20, right).

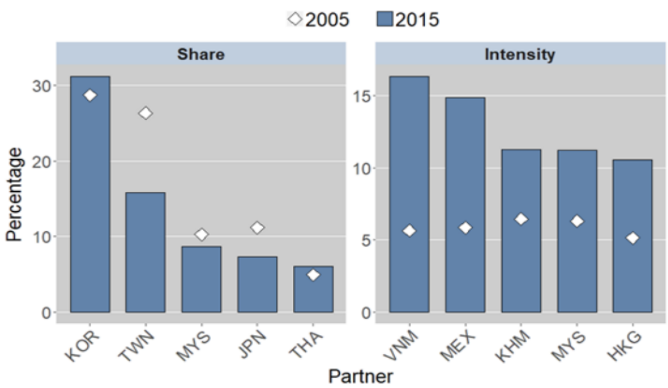


Figure 20. China - Domestic Value-Added Content of Manufactured Imports, Top 5 Partners

Note: As a share of China's total value added embodied in imports (left), as a percent of total imports by partner (right)

Source: OECD, 2018

3.4.5. Turkey

3.4.5.1. Overview

In general view, Turkey has experienced less changes compared to China regarding to interdependencies of export and import between 2005 and 2016. Before going into the details of the trade in value-added indicators, briefly mentioning some conclusions compiled from the latest TIVA report (OECD, 2018), helps to draw a general framework about Turkey's trade over the years.

Beginning with the import content of Turkey's export shows that it has a steadily decrease trend by 2012 with the line of EU20 average, OECD average and G20 average. Foreign value-added content of gross exports for Turkey decreases to 16.5% in 2016 after it reaches to 20.4% in 2012 while it is 15.4% in 2005. Yet, Turkey's import content of exports values is below the EU28 averages, OECD averages and similar to the G20 averages in both years of 2005 and 2016.

In terms of trade partners, Turkey's trade market is highly integrated with European countries (such as Germany, United Kingdom, Italy, Spain, Bulgaria), United States, China, Russia. Germany is the largest export market and value-added content in final demand destination for Turkey. United Kingdom and United States come after Germany. In import side, China is the main partner of Turkey in terms of gross by taking 14.7% in 2015. Germany is second by 10% and Italy is third by 5.9%. In terms of value-added content in final demand, China is also main partner of Turkey by taking 14.8 share of total. Germany comes after China by 10.1%. Although, China is the top import source for Turkey regarding to value-added content and gross terms of import, it is not one of the largest export partners (only seventh) for Turkey from the point of value-added content or gross terms.

General outlook in industries indicates rises in domestic value-added contribution in foreign final demand from 2005 to 2015. This is not valid for all industries. ICT and Electronics experiences a significant fall between 2005 and 2015 and lost the market power to Motor Vehicle industry followed by Other Transport Equipment and Basic Metals. Besides, Motor Vehicles and Basic Metals also have highest import content of Turkey's export in 2015. On the, imported intermediate input used in total exports side, compared to 200, Turkey experiences brief rise to 29.1% in 2015. This is below the OECD average year of 2015 by 45.5% and above OECD average year of 2005 by 25.2%. The highest share of intermediate imports used in Turkey's exports has its source in Motor Vehicles industry by 46.5%. Following industries are Textiles and Apparel and Basic Metals by shares of 35.9% and 34%, respectively.

Services content of Turkey's gross export make significantly important contribution to the Turkey's economy by containing 51.2% (below the OECD average of 54%) of Turkey's total exports in 2015. Services value-added content has share of 33.2% Turkey's total manufactures exports which shows importance for manufacturing competitiveness. By industry, Coke and Refined Petroleum products have the highest share in services by 38.5%. Electrical Equipment comes after with the share of 38.5%, and Motor Vehicles are in the third ranking industry by 38.2%.

3.4.5.2. Import Content of Gross Exports

Figure 21 shows that the world global chains (GVC) have downtrend in recent years. Even though there is a sudden drop with the financial crisis in 2009, all indicators are observed to be close its 2005 values as of the point reached in 2016.

The indicator of import content of exports herein ‘foreign value-added content of gross exports’ of Turkey decreases to 16.5% in 2016 after it reaches to 20.4% in 2012 while it is 15.4% in 2005. Yet, Turkey’s import content of exports values below EU28 averages, OECD averages and similar to the G20 averages.

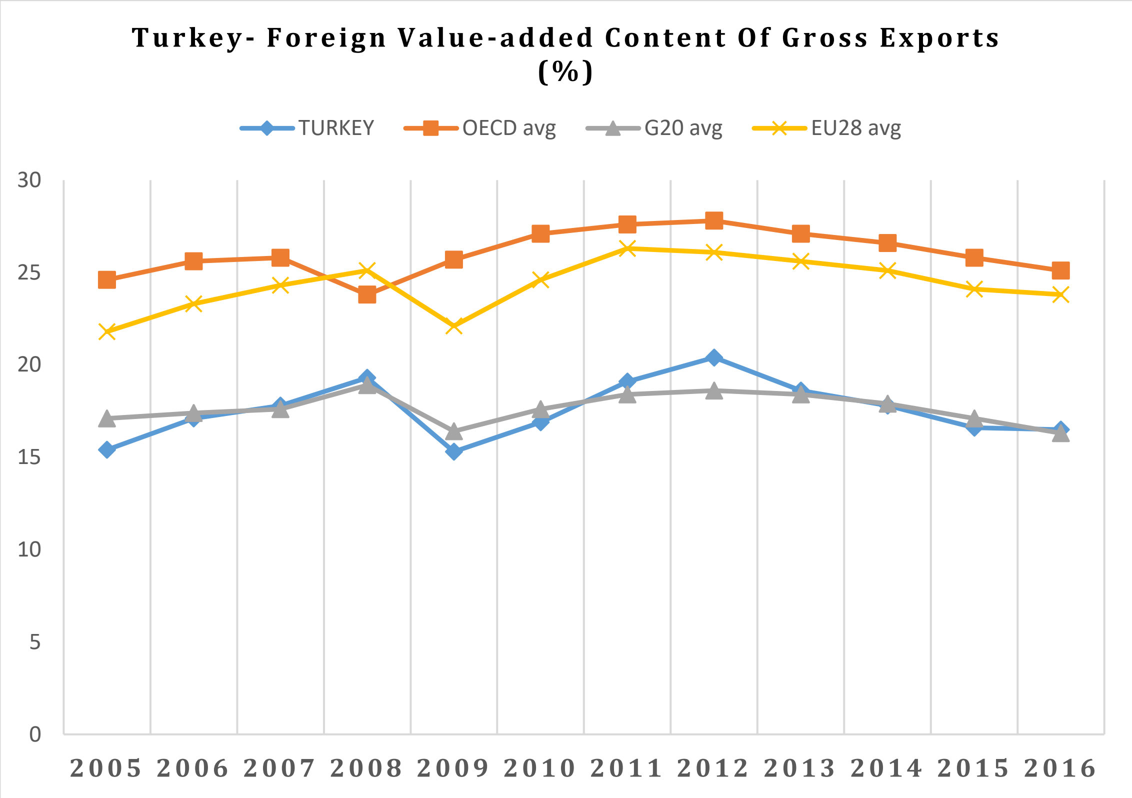


Figure 21. Turkey- Foreign Value-Added Content of Gross Exports

Note: As a percent of total gross exports, 2005 to 2016

Source: OECD, 2018

3.4.5.3. Domestic Value-Added in Foreign Final Demand

As seen in Figure 22, Turkey’s total contribution of the domestic value added in foreign final demands which is driven by abroad consumption reaches to 20% in 2015 while it is 18.2% in 2005. In terms of total manufactures and total services, it is seen that there are similar slight rises for both industries in 2015 compared to 2005.

General outlook in industries indicates rises in domestic value-added contribution in foreign final demand from 2005 to 2015. This is not valid for all industries. ICT and Electronics experiences a significant fall between 2005 and 2015. It has highest share in 2005 by over 70% which drops to 40% in 2015. After this dramatic decrease in ICT and Electronic, Motor Vehicle becomes industry held the highest share by 55.9% in 2015. Basic metals (52.8%) and Other transport equipment (52.8%) ranks second and third. On the lower end side, Information and communication (13%), Agriculture (15%) and Finance and insurance (16%) takes lowest shares of domestic value-added in final demand.

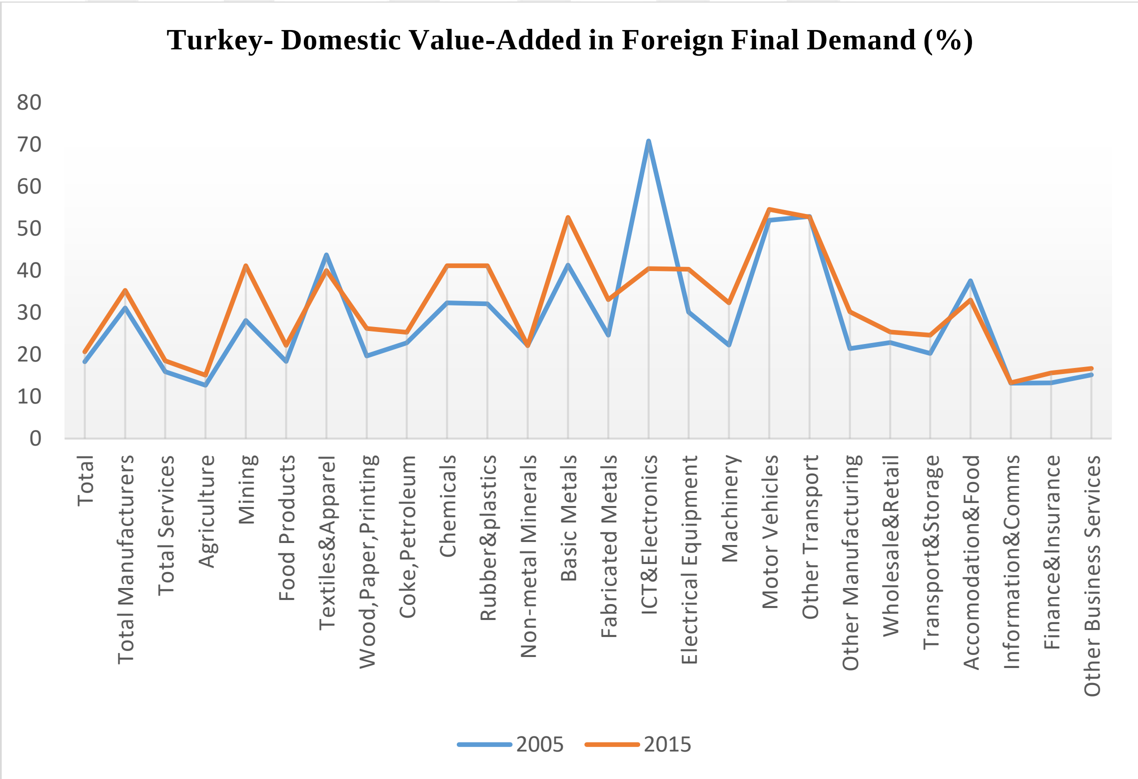


Figure 22. Turkey - Domestic Value Added in Foreign Final Demand

Note: As a percent of value added by industry, 2005 to 2015

Source: OECD, 2018

3.4.5.4. The Importance of Imports for Exports by Industry

Foreign value-added content has slight increase in gross export from 2005 to 2015. Total manufactures and total services also have brief increases over the years as shown in Figure 23. In general view, all industries are close to 2005 levels as an increase or decrease when it comes to 2015, except relatively higher drop in Coke and Refined Petroleum industry. Electrical Equipment (33.6%) has highest share of foreign value-added content in its export. Coke and refined petroleum products take second highest after drop over the years by 32.8% and Motor Vehicles take third ranking by 27.4% in 2015.

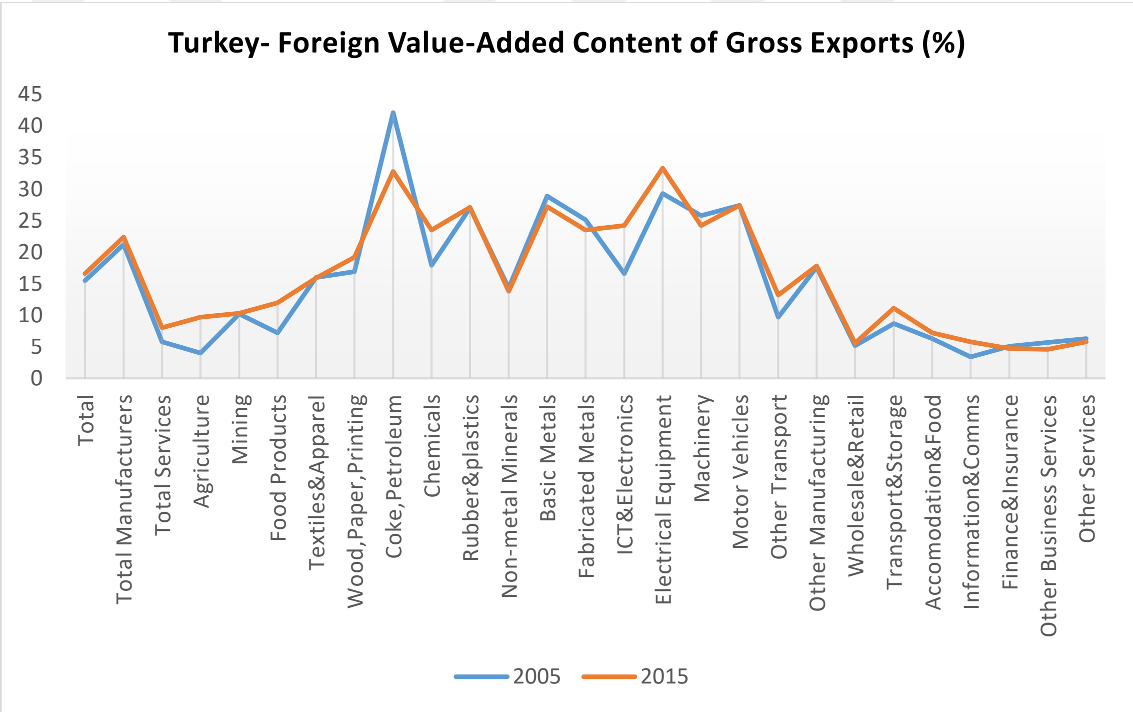


Figure 23. Turkey - Foreign Value-Added Content of Gross Exports

Note: As a percent of gross exports, by industry, 2005 and 2015

Source: OECD, 2018

In comparison with foreign value-added content and domestic value-added content of gross exports by industry shares, as seen in Figure 24, domestic value-added contribution of total exports generates majority. According to the distribution of 2015, the biggest source of domestic value-added export contents are Wholesale and Retail Trade has largest share of domestic value-added content of exports by 10.7%. Textiles and Apparel comes right behind with a share of 9.8% and Transport and Storage generates third by 8.8%. The industries with the highest foreign content in total exports are Basic Metals and Motor Vehicles. The shares of both industries are 2.4%.

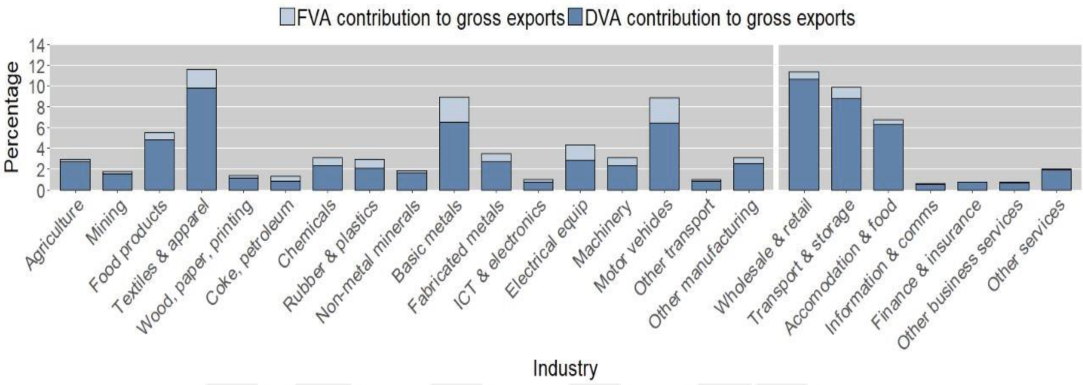


Figure 24. **Turkey - Foreign and Domestic Value-Added Content of Gross Exports by Industry Shares**

Note: As a percent of total gross exports, 2015

Source: OECD, 2018

Figure 25 shows industry origin of imports as intermediate inputs which subsequently embodied in exports. Compared to 2005, imported intermediate input used in total exports experience little rise to 29.1% in 2015. This is below the OECD average year of 2015 by 45.5% and above OECD average year of 2005 by 25.2% (OECD, 2018). The largest share of intermediate imports used in Turkey's exports has its source in Motor Vehicles industry by 46.5%. Following industries are Textiles and Apparel and Basic Metals by shares of 35.9% and 34%, respectively.

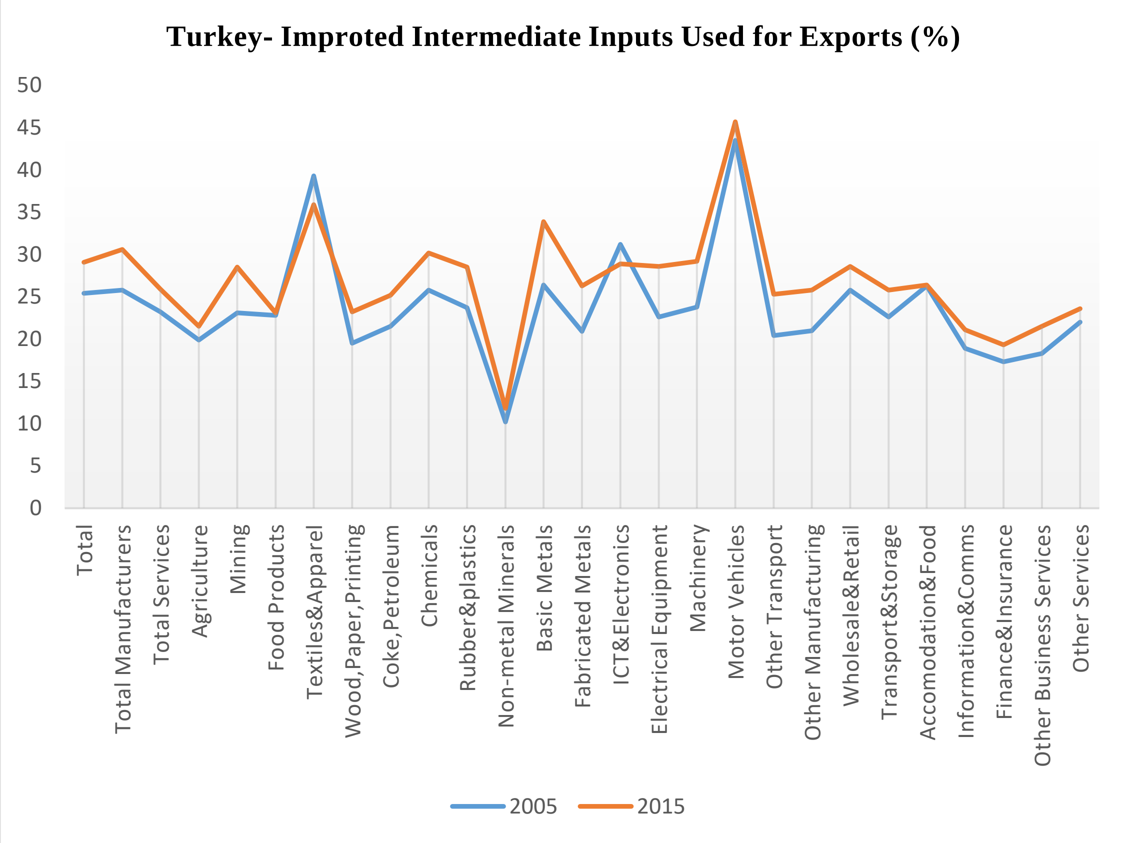


Figure 25. Turkey - Imported Intermediate Inputs Used for Exports, by Industry-Origin of Imports

Note: As a percent of intermediate imports, 2005 and 2015

Source: OECD, 2018

3.4.5.5. Services Content of Gross Exports

As seen Figure 26, services make significantly important contribution to the Turkey's economy by containing 51.2% of Turkey's total exports in 2015. This indicates that it is slightly below the OECD average of 54%. Domestic services take 44.5% of contribution of 51.2% while foreign services have 6.7%. In 2015, services value-added content has share of 33.2% Turkey's total manufactures exports which shows importance for manufacturing competitiveness. By industry, Coke and Refined Petroleum products have the highest share in services by 38.5%. Electrical Equipment comes after with the share of 38.5%, and Motor Vehicles are in the third ranking industry by 38.2% (OECD, 2018

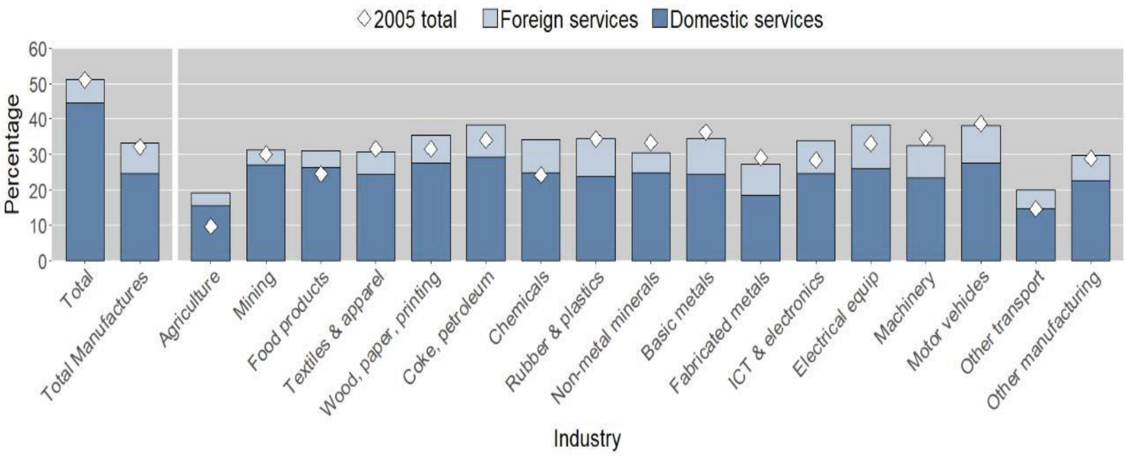


Figure 26. Turkey - Services Content of Gross Exports
Note: As a percent of gross exports by industry, 2015

Source: OECD, 2018

3.4.5.6. Main Trade Partner Countries for Turkey

Turkey's top export market is Germany by 11.4% in 2015 (Figure 27, left). United Kingdom and United States take second and third most important export market in terms of gross by share of 7.3% and 6.8%, respectively. Germany is also top of the list regarding to final destination for value-added content in final demand with the share of 10.1%. United States comes right after Germany by 8.5% share and United Kingdom follows as third with 7.3%.

In import side, China is the main partner of Turkey in terms of gross by taking 14.7% in 2015. Germany is second by 10% and Italy is third by 5.9%. In terms of value-added content in final demand, China is also main partner of Turkey by taking 14.8 share of total. Germany comes after China by 10.1%. United States has 7.5% share and takes third main country for Turkey regarding of the value-added content in final demand (Figure 27, right).

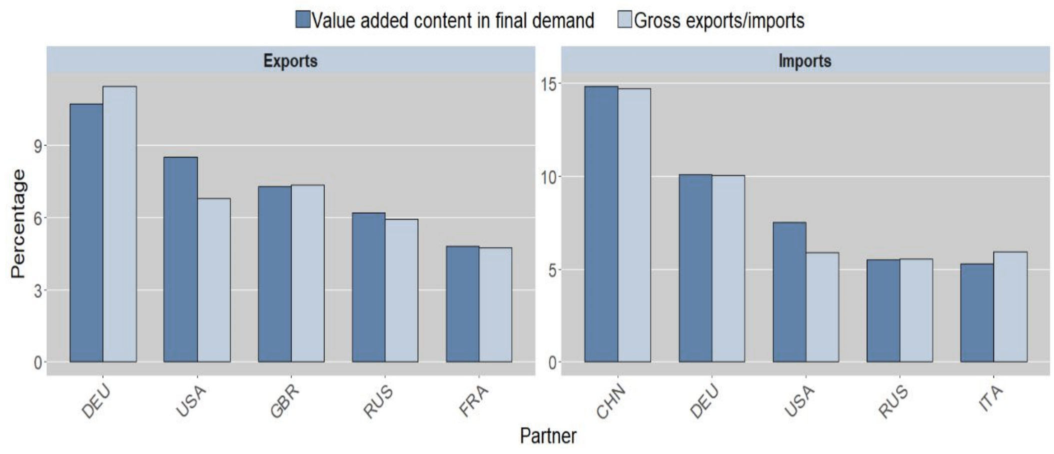


Figure 27. Turkey - Exports to and Imports from Main Partner Countries
Note: As a percent of total gross and value-added exports and imports, 2015

Source: OECD, 2018

From the view of top shares of Turkey's total value-added embodied in manufactured imports, (Figure 28, left) Germany takes highest share by 14.9% as same as gross export side. Italy is the second country by taking 12.4% and Bulgaria follows the Italy as share of 9.7% of Turkey's total domestic value-added content in manufactured imports.

On the other side, main partners of Turkey which have highest share of Turkey's value-added in their manufactured export to Turkey are Bulgaria (3.1 %), Morocco (2%), and Tunisia (1.7 %) by 2015 (Figure 28, right).

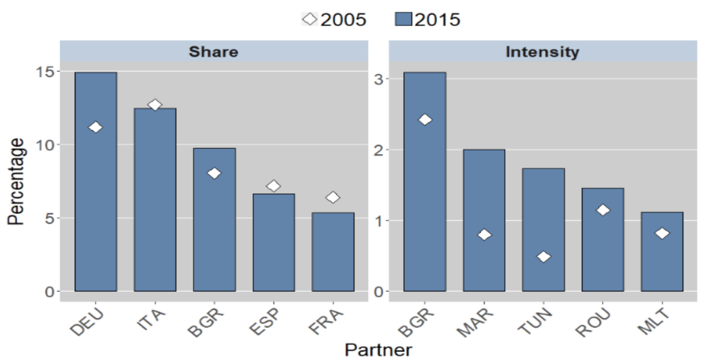


Figure 28. Turkey - Domestic Value-Added Content of Manufactured Imports, Top 5 Partners
Note: As a share of Turkey's total value added embodied in imports (left),
and as a percent of total imports by partner (right)

Source: OECD, 2018

Summary and Discussion

In this chapter, we first attempted to explore the relationship between economic growth and foreign trade after trade liberalization reforms for China (1978) and Turkey (1980). We used imports, exports and GDP as variables from the years of 1978-2017 for China and years of 1980-2017 for Turkey and data was fetched from the official website of World Bank database. We conducted empirical analysis by applying Vector Error Correction Model to examine the relationships between exports, imports and GDP for both countries. Empirical analysis revealed causal relationships from exports to GDP and from imports to export in China. On the other hand, casual direction goes from both imports and exports to GDP in Turkey. Also, opposite to China, there is causality from exports to imports in Turkey. These findings suggest that exports are engine of GDP growth for both countries after decision of trade liberalization. In addition, imports promote exports growth for China, and it is reversed for Turkey. Another important result that should be underlined among the findings is that imports cause to economic growth in Turkey.

After examining the relationship between economic growth and foreign trade for both countries, we wanted to take a closer look at the relationship between exports and imports. For this objective, we used Trade in Value-Added (TIVA) analysis to measure international trade taken into consideration of production fragmentation that is a new approach developed by OECD and WTO. Data covers the years of 2005 to 2015 or 2016 based on availability in the OECD database. In general framework, there is a structural shift in the Chinese economy from manufacturing-led export growth towards domestic supply and consumption with an economy in which the role of services increases. Import content of exports herein 'foreign value-added content of gross exports' of China decreases from above OECD average and EU28 average in 2005 and comes to similar to the G20 average by 2016. Decline in total manufactures despite of increasing gross exports indicates a shift in sourcing of intermediate goods to domestic area. Similar downtrend occurs in the share of China's domestic value-added content driven by foreign final demand. The proportion of imported intermediate inputs built in exports has significant decrease. It suggests that face of China’s production turns to domestic consumption away from foreign final demand. In general view of Turkey, there are less changes compared to China regarding to interdependencies of export and import. Foreign value-added content of gross exports has slightly increase between 2005 and 2016. Yet, it is below the EU28 averages, OECD averages and similar to the G20 averages in both years of 2005 and 2016. A slight increase in the imports content of the exports brings that Turkey has difficulties to strengthen the domestic market in order to reduce dependence on imports. Turkey’s total contribution of the domestic value added in foreign final demands which is driven by abroad consumption has also a slight increase during the years.

Results suggested the inference that imports may simply be consumed, as it does not generate much positive impacts on exports either, only contribute to more imports for Turkey. Yet, China’s imports might have promoted productivity indirectly via exports. This is consistent with findings of Liu (2001) and Tong (1995).

Chapter Four: Washington Consensus versus Beijing Consensus: Relationship Between Trade and Growth in Developing Countries

In previous chapter, econometric analysis was run for China and Turkey after trade liberalization. Results revealed that exports are engine of GDP growth for both countries while imports have significant effect on GDP only in Turkey after reforms of trade liberalization. In addition, imports promote exports in China, and it is reversed for Turkey. Also, TIVA analysis was used to measure international trade taken into consideration of production fragmentation by examining interdependencies of exports and imports in the years of 2005-2016 to deepen findings. The analysis showed that China's domestic market is getting stronger in the international market and there are no significant changes in Turkey.

This chapter aimed to explore whether the associations between imports, export and GDP in Turkey, which differed from those in China, apply to other countries following the Washington Consensus. Argentina, Brazil, Colombia, Dominican Republic, Ecuador, Greece, Malaysia, Mexico, Peru, Poland, Romania and Thailand were selected considering the following four criteria: 1) Middle income countries due to different stage of development may call for different of strategies of development. 2) Countries population were over 10 million in the year 2017 to avoid low population countries. Low population countries have limited resources, not competitive domestic market and high degree of dependency to international trade. 3) Countries liberalizing trade. The reason was to observe dynamics relationship between trade and growth with high degree of participation to international trade. 4) excluding countries such as Russia and Kazakhstan where most of their exports are made up of natural gas. Cuba is also excluded due to long term strict embargo by USA and most of the other industrialized countries.

4.1. Overview

4.1.1. Economic Overview

In this part, there is an economic review based on the macroeconomic indicators of selected countries. In Table 10, there are some indicators that show change in GDP per capita between 1980 and 2017, as well as the average growth rates achieved during this period, and the number of years in which countries experienced negative growth between those years for selected developing countries. Beginning with GDP per capita, by 2017, China experiences increase in GDP per capita approximately 44 times higher of level at 1980 which is the highest rise by far between selected countries. Thailand comes second by increase of around 9 times. Poland and Turkey take third and fourth rankings by increase around 7 and 6 times, respectively. Ecuador, Mexico and Greece experience the lowest increase in their GDP per capita by around 2 times rise. Second indicator is about average growth rate between 1980-2017. Once again China keeps the highest average growth rate over the years by 9.6%. Mexico takes second place with the average of 5.9% and Thailand takes third by 5.2%. Turkey and Dominican Republic come after with the average rate of 4.6%. Greece, Argentina and Romania have the lowest average growth rate by 0.9%, 2.1% and 2.2%, respectively. Third indicator show the number of years countries experience negative growth rate. This indicator is important in terms of giving a clue whether countries' growth experiences are fluctuating or more stable. As seen in the table 10, Argentina has experienced 15 years of negative growth while Greece has 13 years of negative growth rate experience. Brazil, Malaysia, Peru and Romania have 7 years of negative growth experience between the years of 1980-2017. In this period, China has no negative growth rate experience while Turkey has 5 years of negative growth rate. Poland and Colombia have 1 year of experiencing negative growth rate.

Table 10. Some Growth Indicators of Countries

Country Name	GDP Per Capita (USD)			Growth Rate (% average of years)	Number of Years Below 0% Growth Rate
	1980	**2017**	**Ratio (+)**	**1980 - 2017**	**1980 - 2017**
ARGENTINA	2758	14592	*+429%*	2.14	15
BRAZIL	1947	9880	*+407%*	2.45	7
CHINA	195	8760	*+4392%*	9.59	0
COLOMBIA	1241	6376	*+414%*	3.50	1
DOMINICAN REPUBLIC	1165	7609	*+553%*	4.62	3
ECUADOR	2238	6213	*+178%*	3.03	4
GREECE	5893	18884	*+220%*	0.85	13
MALAYSIA	1774	10254	*+478%*	2.58	7
MEXICO	3027	9278	*+207%*	5.87	3
PERU	1033	6710	*+550%*	3.29	7
POLAND	1731*	13856	*+700%*	3.71	1
ROMANIA	1673**	10807	*+546%*	2.22	7
THAILAND	683	6578	*+863%*	5.19	3
TURKEY	1564	10513	*+572%*	4.60	5

*1990, **1987

Source: World Bank, 2019e

In table 11, There are some trade indicators for selected countries. First indicator shows the ratio of total trade corresponding to GDP. In 2017, Malaysia, Thailand and Poland have highest ratio of trade/GDP by 133% and 122%, 104%, respectively. Brazil (24%),

Argentina (25%) and Colombia (35%) have the lowest trade/growth ratio. Turkey and China are the countries showing the biggest change when it comes to 2017 by increasing more than 3 times according to the level of 1980. Trade percentage of GDP increases from 12% to 38% for China and from 17% to 54% for Turkey. Peru has the same level of 1980 in 2017. Brazil, Colombia and Ecuador have the lowest increase between 1980 and 2017. Dominican Republic is the only country that has decrease in trade/GDP ratio by coming from 54% in 1980 to 50% in 2017.

Second indicator shows the percentage medium and high technology exports of total manufactured exports. In 2017, Mexico has the highest share (80%) of medium and high technology in total manufactured exports between the selected countries while it was 61% in 1990. Thailand takes second highest share by increasing from 35% to 63%. Malaysia, Romania and China follow by share of 62%, 60% and 59%, respectively. Turkey increases the share from 20% to 43% in 2017. Peru, Ecuador and Greece have the lowest share of medium and high technology share in total manufactured export while there is no data in World Bank Database for Dominican Republic in terms of this indicator.

As seen in third indicator, Malaysia has the highest share while including only high technology exports in total manufactured exports by 50% in 2017 as same ratio of 2009. China is the second by 31% and Thailand follows with the share of 23% in 2017. Turkey has the lowest high technology exports share in total manufactured exports by 3% while it is 2% in 2007. Peru (5%), Ecuador (8%) and Dominican Republic (8%) come after. The countries with the highest increase in proportion are Colombia (from 3% to 9%), Poland (from 4% to 11%) and Romania (from 4% to 10%), respectively between 2007 and 2017.

Table 11. Some Trade Indicators of Countries

Country Name	Trade (% of GDP)		Medium and High-Tech Exports (% of manufactered exports)		High-Tech Exports (% of manufactered exports)		Import Content of Exports (%)	
	1980	2017	1990	2017	2007	2017	2005	2016
ARGENTINA	11	25	23	45	7	9	11	7
BRAZIL	20	24	37	41	12*	13	11	10
CHINA	12	38	28	59	30	31	26	16
COLOMBIA	31	35	24	42	3	9	10	10
DOMINICAN REPUBLIC	54	50	-	-	10	8	-	-
ECUADOR	35	42	6	15	5*	8	-	-
GREECE	44	67	13	28	9	12	19	21
MALAYSIA	112	133	53	62	50**	50	44	36
MEXICO	22	77	61	80	20*	21	34	36
PERU	47	47	7	6	3*	5	13	10
POLAND	43*	104	41	55	4	11	24	27
ROMANIA	41**	85	38	60	4	10	27	21
THAILAND	54	122	35	63	27	23	38	32
TURKEY	17	54	20	43	2	3	15	16

*2008 **2009 *High-Tech Exports*
*1995 **1990 *Trade*

Source: World Bank, 2019f

Last indicator is import content of exports. Malaysia and Mexico have the highest ratio of import content in their exports by 36% in 2016. Thailand, Poland, Romania and Greece come after by ratio of 32%, 27%, 21% and 21%, respectively. China and Turkey both have 16% share of import content in their exports while Argentina (7%), Peru (10%) and Brazil 810%) have the lowest shares. There is no data for Ecuador and Dominican Republic regarding to import content in export in World Bank Database.

Figure 27 shows the import content of exports between 2007 and 2016 for selected countries. Apart from falls, rises or fluctuations over the years, countries have the highest and lowest share of import content in export mostly keep their positions. Malaysia, Mexico and Thailand have the highest share over the years while Argentina, Brazil, Peru and Colombia have the lowest proportion of import content of export during the years between 2005 and 2016. As pointed previously, Malaysia, Mexico and Thailand have also the highest share medium and high technology in total manufactured exports between selected countries. High import content of exports bases an explanation for high share of high technology exports in total manufactured exports.

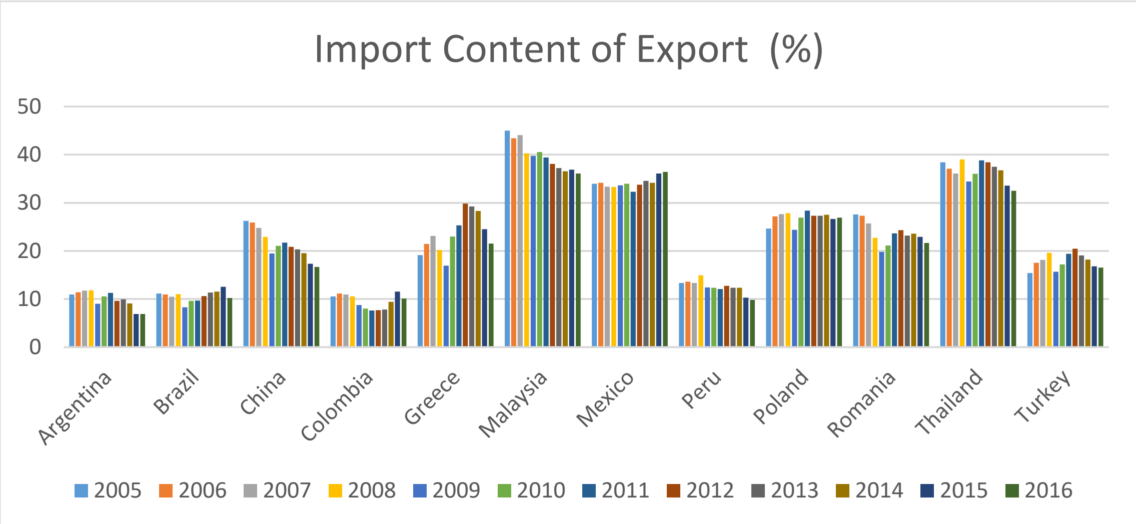


Figure 29. Percentage of Import Content in Export

Source: OECD, 2019

4.1.2. Empirical Overview

Causality tests in the framework of VAR or VEC models were run for selected countries to find out short term causality direction among the variables GDP, export and import included past values as lags at 5% significance level. Results are shown in the table 12.

Table 12. *Causality Direction Among the GDP, Export and Import

Country Name	Export-led	Growth-led	Import-led	Exp-Imp-gdp	
ARGENTINA	ELG		ILG		GDP → IM
BRAZIL	ELG	GLE	ILG	EX → IM	GDP → IM
CHINA	ELG			IM → EX	
COLOMBIA		GLE	ILG	EX ↔ IM	GDP → IM
DOMINICAN REPUBLIC		GLE	ILG	IM → EX	GDP → IM
ECUADOR	ELG	GLE	ILG		
GREECE	ELG		ILG		
MALAYSIA		GLE	ILG	IM → EX	GDP → IM
MEXICO	ELG		ILG	IM → EX	GDP → IM
PERU		GLE		EX ↔ IM	GDP → IM
POLAND	ELG	GLE	ILG	EX ↔ IM	
ROMANIA	ELG		ILG	EX → IM	
THAILAND		GLE		EX ↔ IM	
TURKEY	ELG		ILG	EX → IM	

EX: Exports **IM**:Imports **ELG**: GDP caused by Exports
ILG: GDP caused by Imports **GLE**:Exports caused by GDP
*VEC Granger Causality in short terms withing lags

Note: This table was compiled from the results of the econometric analysis applied in this chapter. See pages 109-122 for details.

The first noticeable inference is causality from the imports to GDP applies for almost all countries that have export causality to GDP. China is only exception in terms of having exports causal direction to GDP without imports causality. As seen from the table, Brazil, Colombia, Dominican Republic, Ecuador, Malaysia, Peru, Poland and Thailand have causality from GDP to exports. Imports caused GDP is valid for all countries except China, Peru and Thailand. There is bilateral causal relationship between exports and imports for Colombia, Peru, Poland and Thailand. One-way direction from imports to exports holds true for China, Dominican Republic, Malaysia and Mexico. The opposite way round applies for Brazil, Romania and Turkey that means causality comes from exports to imports for these countries. Argentina, Brazil, Colombia, Dominican Republic, Malaysia, Mexico and Peru have causal direction from GDP to imports.

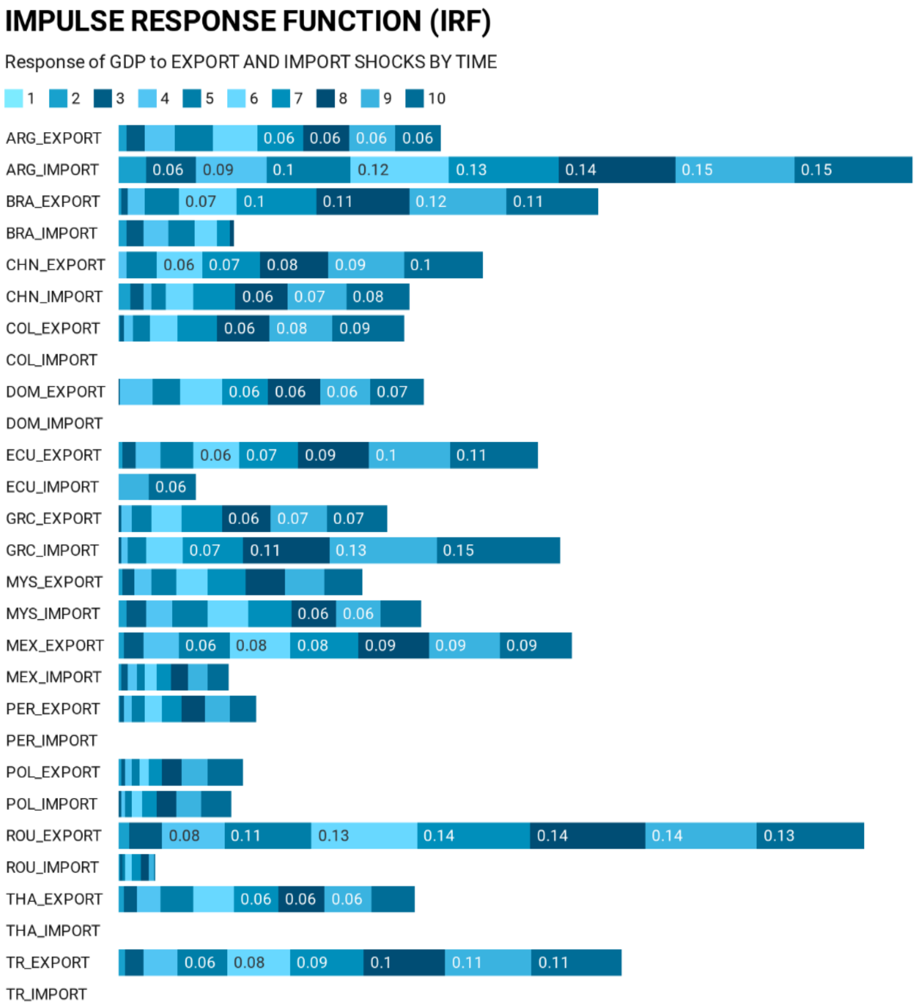


Figure 30. Response of GDP to Export and Import Shocks for Selected Countries

Note: This table was compiled from the results of the econometric analysis applied in this chapter. See Appendix.

As adoption of reflect shocks impacts on an internal variable, Impulse Response Functions (IRF) for selected countries are shown in the Figure 30. IRF refers that GDP response of export shocks is positive for all selected countries over the periods in different size of impacts. Moreover, GDP responds positively to import shocks for Argentina, Brazil, China, Ecuador, Greece, Malaysia, Mexico, Poland and Romania. On the other hand, import shocks causes negative responses for Colombia, Dominican Republic, Peru, Thailand and Turkey. In comparison of exports and import shocks impacts; import shocks have larger impact on GDP for Argentina, Greece and Malaysia while export shocks are more effective on GDP in rest of selected countries. Argentina has the largest positive effects of import on GDP. On the other side, Romania has the largest of the export shocks impact on the GDP between the selected countries. In addition to this, Malaysia has the weakest export shocks effect on GDP. Export and import effects on GDP are close to each other in favor of exports shocks While Turkey has the negative impact of import shocks by GDP side.

Variance Decomposition is a decomposition of mean square error into variable contribution in a system over the periods of time. In other words, Variance decomposition analysis the contribution of each variable to each other as a sequence of relative influences. Figure 29 demonstrates variance decomposition of GDP for selected countries. According to predicted variance of GDP, all selected countries have more significant contribution of export to GDP than import. In comparison, while the contribution of exports in some countries (Brazil, China, Ecuador, Mexico, Poland, Romania, Thailand and Turkey) is higher than imports, in some countries (Argentina, Colombia, Dominican Republic, Greece, Malaysia and Peru) imports contribute more than exports. Mexico holds the largest contribution of export between selected countries where Peru has the weakest influence of export on GDP. On the other hand, Argentina shows the most significant contribution to GDP between the countries while Romania holds the weakest contribution of import. In terms of contribution to GDP; Turkey, Mexico and Romania have the largest gaps between export and import in comparison of other selected countries.

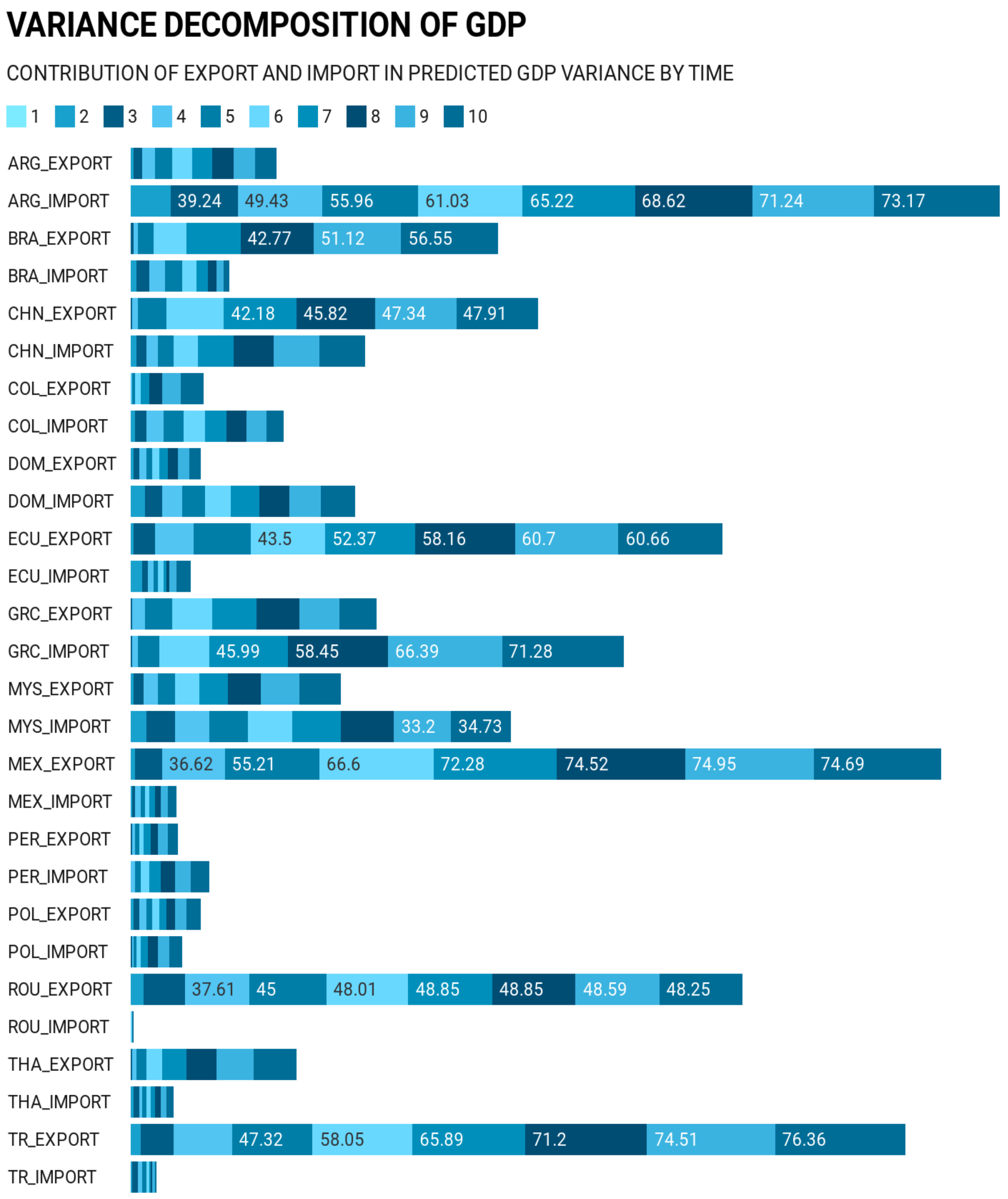


Figure 31. Contribution of Export and Import to GDP

Note: This table was compiled from the results of the econometric analysis applied in this chapter. See Appendix

4.1.3. Summary View of Empirical Results by Countries

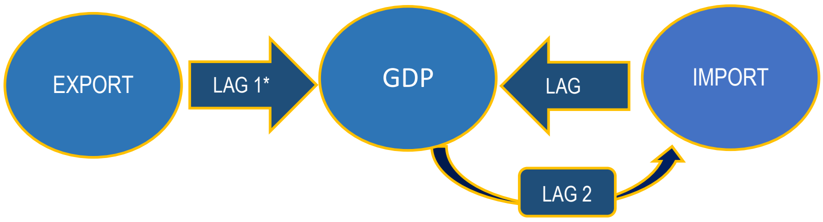
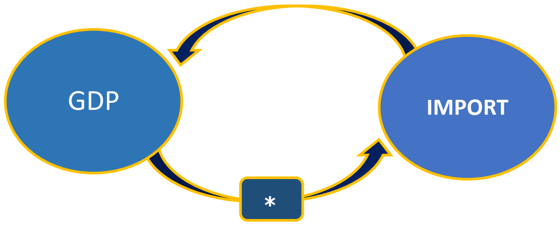
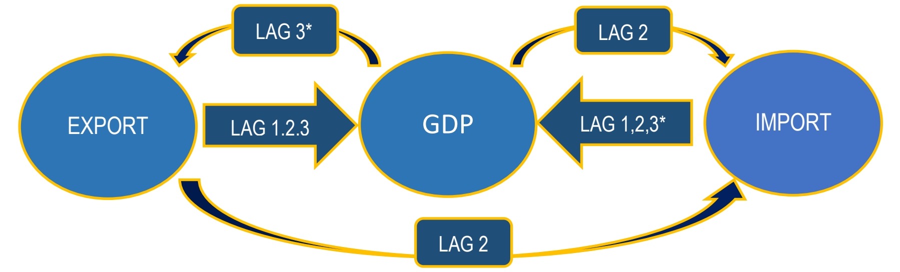
ARGENTINA			
Variables: Log(GDP) Log(EXPORT) Log(IMPORT)	**Sample:** 1980-2017 (Annual, Constant 2015 USD)	**Stationarity:** All variables are stationary at first difference	**Lag:** Optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility.
VEC Tests *10% significance level			
Granger Causality *10% significance level			
Impulse Response Functions (IRF)	**Response of GDP to Export and Import Shocks:** Both are positive and increasingly in time. Import shocks are almost 3 times more effective on GDP than export shocks. **Response of Export to Import and GDP Shocks:** Import shocks have positive effects on Export, but GDP shocks have declining negative effects by time. **Response of Import to Export and GDP Shocks:** Export shocks are positive and GDP shocks are negative on import in time.		
Variance Decomposition	**Variance Decomposition of GDP:** In GDP predicted variance; contribution of import reaches to over 70% by time while export has around 12% at same time sequence. **Variance Decomposition of Export:** In EXPORT predicted variance; GDP contributes up to over 70% in time whereas import contributes up to 7% in time. **Variance Decomposition of Import:** In IMPORT predicted variance; contribution comes from import itself over 65% in time. GDP contributes up to 9% and contribution of export down to 23% by 10th period while it was 27% at first period.		

Figure 32. A Glance to Econometric Results for Argentin

<table>
<tr><th colspan="4">BRAZIL</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1980-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 4 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests

*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality

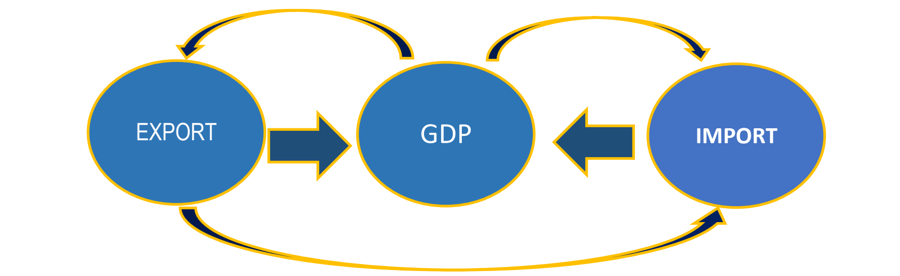
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to export shocks are positive and increasing gradually until 4th period. By 5th period, there is acceleration in increasing trend until 9th period. Import shocks have gradually increasing positive effect at firs periods on GDP responses. By 9th period, it goes down below the zero and becomes negative effect.
Response of Export to Import and GDP Shocks: Import shocks have negative effects on Export, but GDP shocks have declining positive effects by time.
Response of Imports to Export and GDP Shocks: Export and GDP shocks are positive on import. Export shocks start an increasing trend at 6th period and go higher than effects of GDP shocks on import in time.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of import reaches to around 9% then go back initial level 3% by time while export increases to 56% at same time sequence.
Variance Decomposition of Export: In EXPORT predicted variance; GDP contributes up to over 33% in 5th period then go down to 18% in the end of 10th period whereas import contributes around 2% all over the time periods.
Variance Decomposition of Import: In IMPORT predicted variance; contribution comes from GDP starts 44% to 56% in time. Export contribution comes back to initial level around 30% in time.</td></tr>
</table>

Figure 33. A Glance to Econometric Results for Brazil

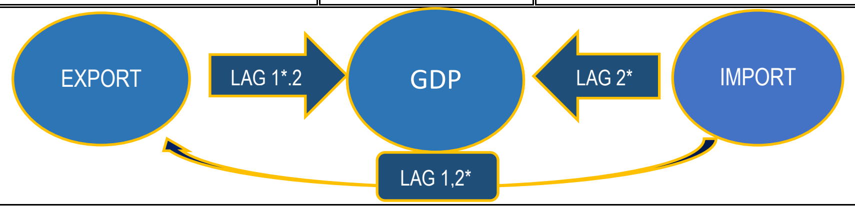
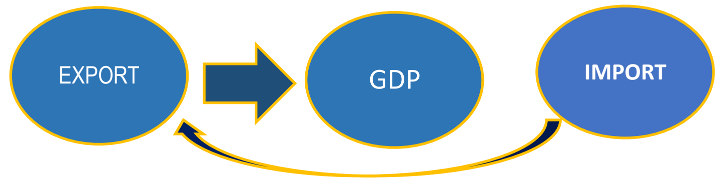
<table>
<tr><th colspan="4">CHINA</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1978-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to export and import shocks are positive and have significantly increasing trend over time. Moreover, import shocks follow the same path of export shock as just below. GDP shocks start with a positive trend initially then go down below the zero at 5th period. After that GDP shocks become negative on GDP decreasingly by time.
Response of Export to Import and GDP Shocks: GDP shocks have increasing negative effect on export. Import shocks have positive effect on export over the time as following the effect of export shocks trend.
Response of Import to Export and GDP Shocks: Export shocks have significantly increasing positive effect on import as following the effect of import shocks trend. GDP shocks have negative effect on imports increasingly by time.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of export reaches to above 47% by time. Import contributes to around 27% at same time sequence. Export is the main contributor for GDP by 47% over the time with increased contribution from imports.
Variance Decomposition of Export: In EXPORT predicted variance; contribution of GDP increases from 25% to 29% while import contribute up to 11%. Export is the main contributors to itself by 59%.
Variance Decomposition of Import: In IMPORT predicted variance; contribution comes from GDP increases to 20% over the time. Export contribution increases up to 42%. Export and import have the major contribution for import.</td></tr>
</table>

Figure 34. A Glance to Econometric Results for China

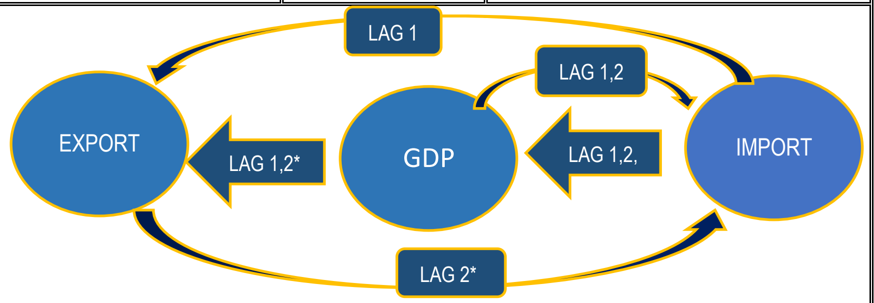
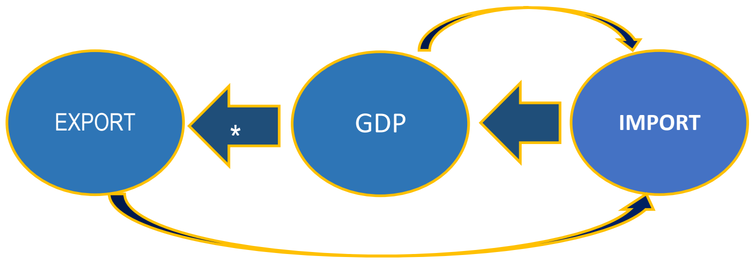
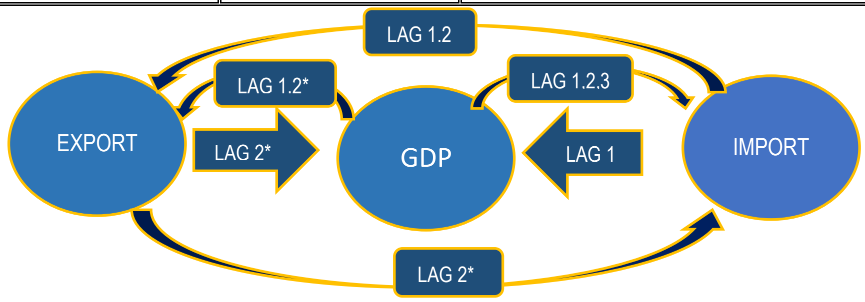
<table>
<tr><th colspan="4">COLOMBIA</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1980-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to export shocks are positive and has an increasing trend over time. Import shocks have negative effect on GDP responses. GDP shocks have major effect on GDP responses positively
Response of Export to Import and GDP Shocks: Import shocks have negative effects on Export, but GDP shocks have positive effects on export by time.
Response of Import to Export and GDP Shocks: Export and GDP shocks are positive on imports.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of imports reaches to around 10% by time while exports increase to 13% at same time sequence. GDP is the major contribution for itself by average 80% over the time.
Variance Decomposition of Export: In EXPORT predicted variance; GDP contributes in average 65% in time whereas import contribute around 5% all over the time periods.
Variance Decomposition of Import: In IMPORT predicted variance; contribution comes from GDP starts 76% to 67% in time. Export contribution rises to around 27%.</td></tr>
</table>

Figure 35. A Glance to Econometric Results for Colombia

<table>
<tr><th colspan="4">DOMINICAN REPUBLIC</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1980-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 4 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests

*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality

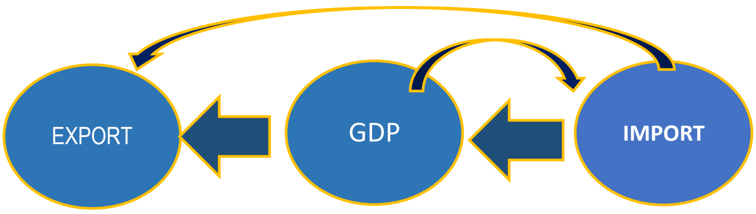
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to export shocks are positive and has an increasing trend over time. Import shocks have negative effect on GDP responses. GDP shocks have major effect on GDP responses positively.
Response of Export to Import and GDP Shocks: Import shocks have negative effects on Export, but GDP shocks have positive effects on export by time.
Response of Import to Export and GDP Shocks: GDP shocks have major effect on import responses positively. Export shocks have positive also but weak effect on import.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of import reaches to around 20% by time while export increases to 6% at same time sequence. GDP is the major contributor for itself by over 73% over the time.
Variance Decomposition of Export: In EXPORT predicted variance; GDP contributes in average 38% in time whereas import contributes around 33% all over the time periods.
Variance Decomposition of Import: In IMPORT predicted variance; contribution comes from GDP starts 75% to 93% in time. Export contribution is around 2%.</td></tr>
</table>

Figure 36. A Glance to Econometric Results for Dominican Republic

<table>
<tr><th colspan="4">ECUADOR</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1980-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 4 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests

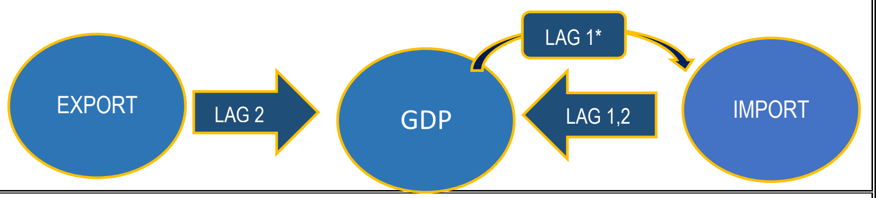
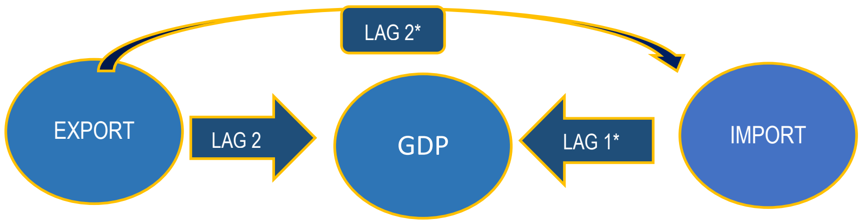
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality</td><td colspan="3">
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to export shocks are positive and has an increasing trend over time. Import shocks have negative effect on GDP until 6th period then becomes positive and increasing trend.
Response of Exports to Imports and GDP Shocks: Import and GDP shocks have positive effects on Export. Import shocks have increasing trend and go above GDP shocks.
Response of Import to Export and GDP Shocks: GDP and export shocks have positive effect and increasing trend on import.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of export reaches to above 60% by time while import increases to 8% at same time sequence. Export is the major contributor for GDP over the time.
Variance Decomposition of Export: In EXPORT predicted variance; GDP contributes export from 23% to 26% in time whereas import contribute up to 17% all over the time periods.
Variance Decomposition of Import: In IMPORT predicted variance; contribution comes from Export by up to 47% in time. GDP contribution is around 12%.</td></tr>
</table>

Figure 37. A Glance to Econometric Results for Ecuador

<table>
<tr><th colspan="4">GREECE</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1980-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests

*10% significance level</td><td colspan="3">



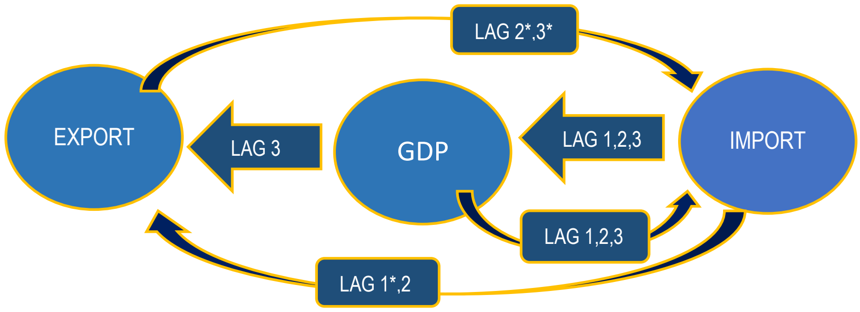
</td></tr>
<tr><td>Granger Causality

*10% significance level</td><td colspan="3">

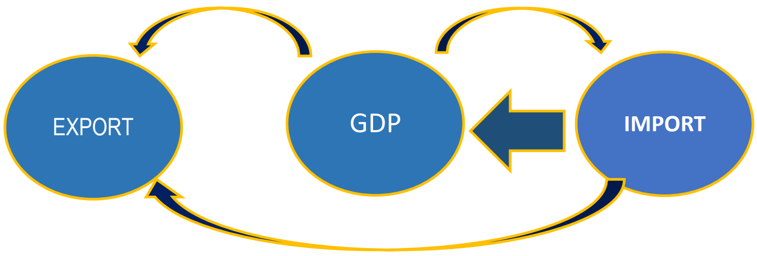
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to import shocks are positive and has an increasing trend over time. Export shocks are also positive and have increasing trend. Import shocks are 2 times more effective than export shocks.
Response of Export to Import and GDP Shocks: Import and GDP shocks have positive effects on Export. Import shocks have increasing trend and go above GDP shocks.
Response of Import to Export and GDP Shocks: Export shocks have positive effect and increasing trend on import. GDP shocks are also positive but in a declining trend.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of imports reaches to above 70% by time while exports increase to around 22% at same time sequence. Import is the major contributor for GDP over the time.
Variance Decomposition of Export: In EXPORT predicted variance; contribution of GDP decreases from 47% to 25% in time whereas import contribute up to 22% all over the time periods.
Variance Decomposition of Import: In IMPORT predicted variance; contribution comes from Export up to 38% then go back to 33% in time. GDP contribution is around 9%. Import is the major contributor to itself.</td></tr>
</table>

Figure 38. A Glance to Econometric Results for Greece

<table>
<tr><th colspan="4">MALAYSIA</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1980-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 4 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests

*10% significance level</td><td colspan="3">


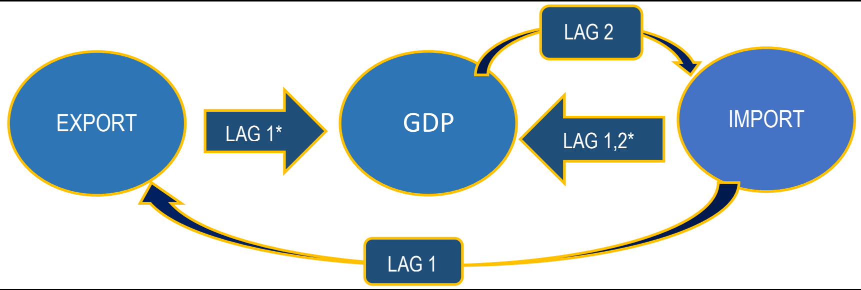
</td></tr>
<tr><td>Granger Causality

*10% significance level</td><td colspan="3">


</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to import and export shocks are positive and has an increasing trend over time by following each other.
Response of Export to Import and GDP Shocks: Import shocks have positive effects on Export. GDP shocks have declining negative effect on Exports.
Response of Import to Export and GDP Shocks: Export shocks have positive effect and increasing trend on import. GDP shock have negative effect in a declining trend.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of imports reaches to above 34% by time while exports increase to around 24% at same time sequence. GDP puts the major contribution for itself over the time.
Variance Decomposition of Export: In EXPORTS predicted variance; contribution of GDP increases up to 16% in time whereas import contribute up to 60% all over the time periods.
Variance Decomposition of Import: In IMPORTS predicted variance; contribution comes from Export is up to 23% in time. GDP contribution is around 14%. Import has the major contribution of itself.</td></tr>
</table>

Figure 39. A Glance to Econometric Results for Malaysia

<table>
<tr><th colspan="4">MEXICO</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1980-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests

*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality

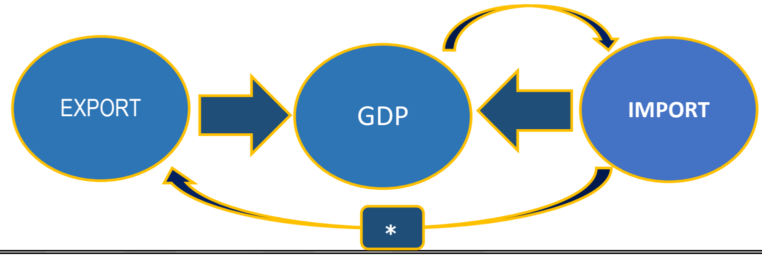
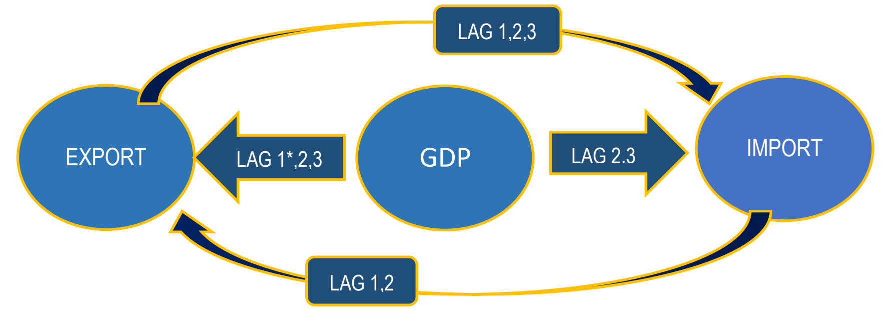
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to import and export shocks are positive and has an increasing trend over time. Yet, export shocks are 3 times more effective than import shocks.
Response of Export to Import and GDP Shocks: Import and GDP shocks have positive effects on export with a close range to each other.
Response of Import to Export and GDP Shocks: Export shocks have significant positive effect on import. GDP shocks have negative effect by levels just below the zero.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of exports reaches to above 74% by time while import increases to around 5% at same time sequence. Export is the main contributor for GDP over the time.
Variance Decomposition of Exports: In EXPORTS predicted variance; contribution of GDP and imports increases up to 6% and 8%, respectively. Export is the main contributor to itself.
Variance Decomposition of Imports: In IMPORTS predicted variance; contribution comes from Export is up to 72% in time. GDP contribution is around 3%. Export has the major contribution for imports.</td></tr>
</table>

Figure 40. A Glance to Econometric Results for Mexico

<table>
<tr><th colspan="4">PERU</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1980-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 4 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests

*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality

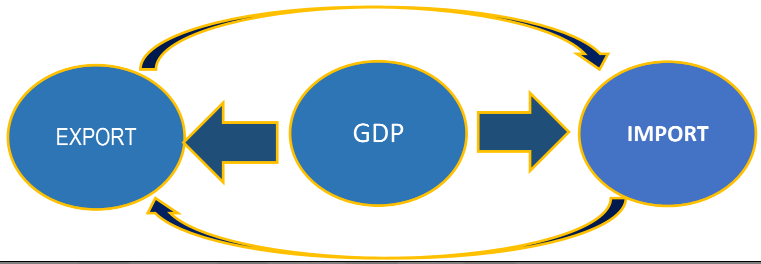
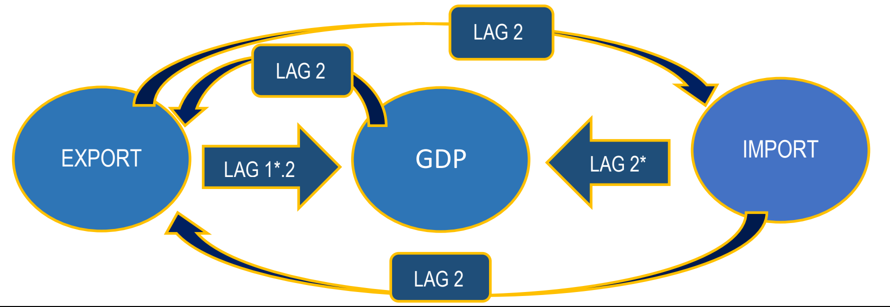
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to export shocks are positive and has gradual increasing trend over time. Yet, import shocks have negative effect on GDP with a declining trend.
Response of Export to Import and GDP Shocks: GDP shocks have significantly positive effect on export. But import shocks have weak positive effects on exports over the time.
Response of Import to Export and GDP Shocks: Export shocks have weak positive effect on import while GDP shocks have significantly positive effect as similar as export responses.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of exports reaches to above 10% by time whereas import increases to around 10% at same time sequence. GDP is the main contributor for itself over the time.
Variance Decomposition of Export: In EXPORT predicted variance; contribution of GDP and import increases up to 86% and 5%, respectively. GDP is the main contributor to export.
Variance Decomposition of Import: In IMPORT predicted variance; contribution comes from GDP is up to 90% in time. Export contribution is around 5%. GDP has the major contribution for imports.</td></tr>
</table>

Figure 41. A Glance to Econometric Results for Peru

<table>
<tr><th colspan="4">POLAND</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1990-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests

*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality

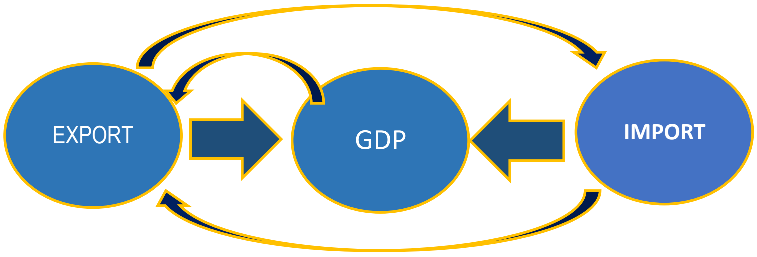
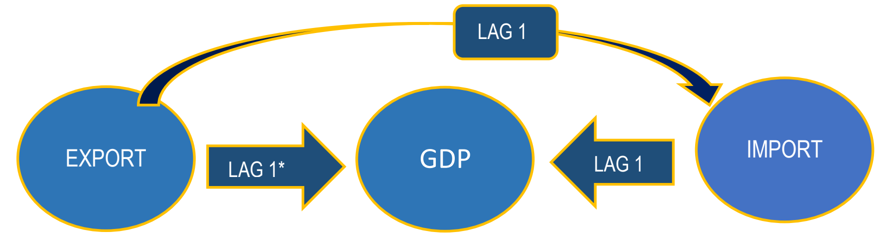
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to export and import shocks are positive and has gradual increasing trend over time. Yet, GDP shocks have higher positive effect on itself.
Response of Export to Import and GDP Shocks: GDP shocks have significantly increasing positive effect on export. Import shocks have weaker positive effects on export over the time.
Response of Import to Export and GDP Shocks: GDP shocks have significantly increasing positive effect on import. Export shocks have weaker positive effect on import while GDP shocks have significantly increasing positive effect as similar as export responses.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of export reaches to above 9% by time whereas import increases to around 9% at same time sequence. GDP is the main contributor for itself over the time.
Variance Decomposition of Export: In EXPORT predicted variance; contribution of GDP starts with 77% to 67% while import increases up to 8%. GDP is the main contributor to export.
Variance Decomposition of Import: In IMPORT predicted variance; contribution comes from GDP is around 77% in time. Export contribution increases up to 8%. GDP has the major contribution for import.</td></tr>
</table>

Figure 42. A Glance to Econometric Results for Poland

<table>
<tr><th colspan="4">ROMANIA</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1990-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Tests

*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality

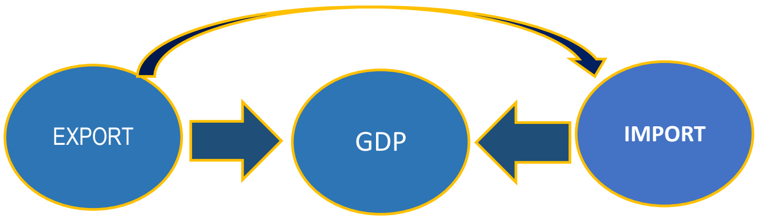
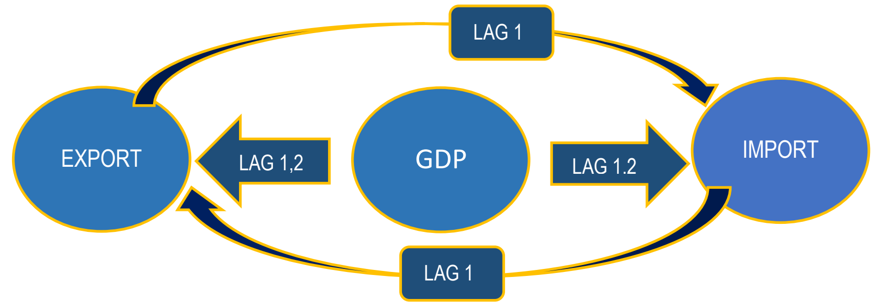
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to export shocks are positive and has significantly increasing trend over time by following GDP shocks. Yet, import shocks have weaker positive effect on GDP.
Response of Export to Import and GDP Shocks: GDP shocks have significantly increasing positive effect on export close the effect of export shocks. Import shocks have weaker positive effects on export over the time.
Response of Import to Export and GDP Shocks: GDP and export shocks have significantly increasing positive effect on import with a similar trend path.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of export reaches to above 48% by time whereas import increase to around 1% at same time sequence. GDP and export are the main contributors for GDP over the time.
Variance Decomposition of Export: In EXPORT predicted variance; contribution of GDP increases up to 37% while import contributes around 1%. Export is the main contributors to itself by 62%.
Variance Decomposition of Import: In IMPORT predicted variance; contribution comes from GDP increases up to 43% in time. Export contribution increases up to 56%. GDP and export have the major contribution for import.</td></tr>
</table>

Figure 43. A Glance to Econometric Results for Romania

<table>
<tr><th colspan="4">THAILAND</th></tr>
<tr><td>Variables:
Log(GDP)
Log(EXPORT)
Log(IMPORT)</td><td>Sample:
1980-2017
(Annual, Constant 2015 USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 2 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VAR Tests

*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality

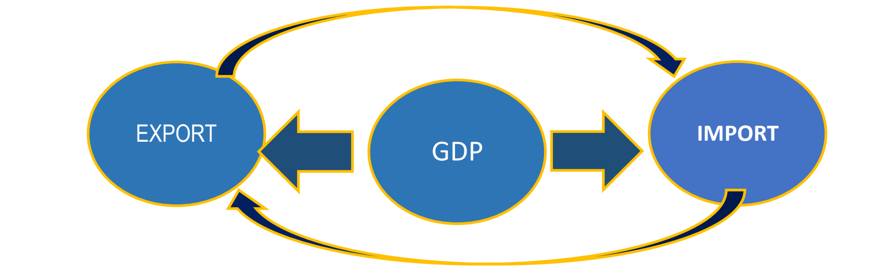
*10% significance level</td><td colspan="3">
</td></tr>
<tr><td>Impulse Response Functions (IRF)</td><td colspan="3">Response of GDP to Export and Import Shocks: Response of GDP to export shocks are positive and has gradual increasing trend over time. Yet, import shocks have negative effect on GDP.
Response of Export to Import and GDP Shocks: GDP shocks have decreasing positive effect on export. Import shocks have negative effects on export over the time.
Response of Import to Export and GDP Shocks: Export shocks have gradually increasing positive effect on imports. GDP has brief increasing positive effect initially. Yet, then it decreases to zero level.</td></tr>
<tr><td>Variance Decomposition</td><td colspan="3">Variance Decomposition of GDP: In GDP predicted variance; contribution of export reaches to above 24% by time whereas import increases to around 4% at same time sequence. GDP is the main contributor for itself by 71% over the time.
Variance Decomposition of Export: In EXPORT predicted variance; contribution of GDP decreases from 57% to 30% while import contributes up to 10%. Export is the main contributor to itself by 59%.
Variance Decomposition of Import: In IMPORT predicted variance; contribution comes from GDP increases to 83% in second period then decreases to 45% by 10^{th} period. Export contribution increases up to 44%. GDP and export have the major contribution for import.</td></tr>
</table>

Figure 44. A Glance to Econometric Results for Thailand

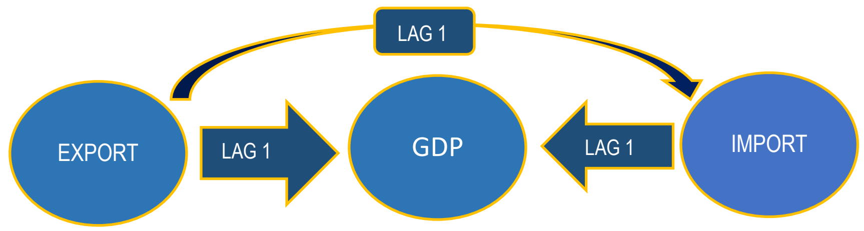
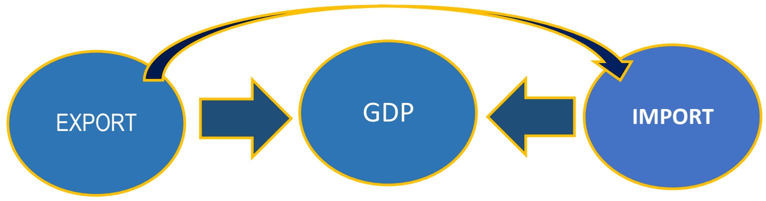
TURKEY			
Variables: Log(GDP) Log(EXPORT) Log(IMPORT)	**Sample:** 1980-2017 (Annual, Constant 2015 USD)	**Stationarity:** All variables are stationary at first difference	**Lag:** Optimal lag selected as lag 2 based on AIC, SC, HQ and model diagnostics compatibility.
VEC Tests *10% significance level			
Granger Causality *10% significance level			
Impulse Response Functions (IRF)	**Response of GDP to Export and Import Shocks:** Response of GDP to export shocks are positive and have significantly increasing trend over time. Import shocks have negative effects on GDP at first periods. Then it follows an increasing trend and becomes positive by 8th period. GDP shocks start with a positive trend initially then fluctuates at similar positive levels. **Response of Export to Import and GDP Shocks:** GDP shocks have increasing positive effect on export. Import shocks have similar positive effect trend just below GDP shocks. **Response of Import to Export and GDP Shocks:** Export shocks have significantly increasing positive effect on import. Import and GDP shocks have similar positive effect trend on import increasingly by time.		
Variance Decomposition	**Variance Decomposition of GDP:** In GDP predicted variance; contribution of exports reaches to above 76% by time. Import contributes to around 2% at same time sequence. Export is the main contributor on GDP over the time. **Variance Decomposition of Export:** In EXPORT predicted variance; contribution of GDP is around 17% while import contributes up to 3%. Export is the main contributor to itself by 79%. **Variance Decomposition of Import:** In IMPORT predicted variance; contribution comes from GDP increases to 20% over the time. Export contribution increases up to 68%. Export has the major contribution for import.		

Figure 45. A Glance to Econometric Results for Turkey

4.2. Empirical Analysis

4.2.1. Data

Variables used in this analysis are the logarithm of real GDP as measurement of economic growth (Constant 2015 US$), logarithm of exports of goods and services (Constant 2015 US$) and logarithm of imports of goods and services (Constant 2015 US$) as measurements of the trade. Analysis uses observations of selected developing countries (Argentina, Brazil, Colombia, Dominican Republic, Ecuador, Greece, Malaysia, Mexico, Peru, Poland, Romania, Thailand) in the years of 1980-2017. Sample for Poland and Romania start by 1990 based on availability since they are former Soviet Union countries and later declared their independence. Data is annual and imported from the World Bank database (World Bank, World Development Indicators, 2019).

.

4.2.2. Methodology

This chapter focuses on the relationship between trade and growth in China and thirteen developing countries (including Turkey) following Washington consensus policies. The reason for including the other developing countries was to explore whether the associations between imports, export and GDP in Turkey, which differed from those in China, apply to other countries following the Washington Consensus. These countries were selected considering the following four criteria: 1) Middle income countries due to different stage of development may call for different of strategies of development. 2) Countries population were over 10 million in the year 2017 to avoid low population countries. Low population countries have limited resources, not competitive domestic market and high degree of dependency to international trade. 3) Countries liberalizing trade. The reason was to observe dynamics relationship between trade and growth with high degree of participation to international trade. 4) excluding countries such as Russia and Kazakhstan where most of their exports are made up of natural gas. Gas agreements are long term. Therefore, they are not suitable in terms of the dynamic relationship between trade and growth, which are discussed with their lags in this study. In addition, Cuba is also excluded due to the long term and strict embargo by USA and majority of countries. In this regard, their participation in free foreign trade was politically restricted.

There are many investigations in literature focus on causal relationship between trade and growth (Balassa, 1978; Sheehey,1992; Kruger, 1998; Sharer 1999; Thirwall, 2011). Vector Autoregressive (VAR) and Vector Error Correction (VEC) models are frequently used for this investigation to deepen analysis of causality (Wan and Xie, 2006; Lin and Cao, 2007; Yu and Sun; 2016).

Vector Autoregressive Model (VAR)

As combination of several models of autoregressive (AR), Vector Autoregressive is a multivariate system where any of each variable is defined with historical values of all variables estimated in a system. Since the work of Sims (1980), it has been widely used and extended for modeling and forecasting. VAR model is typically and commonly applying for study the dynamics of the growth and chosen macroeconomic indicators by economists. The importance of a VAR model is that variables are considered symmetrically in a structural sense. Thus, it can be seen as a system of form equations in which each of the internal variables is subjected to regression on its own and lagged values of other variables in the system (Gujarati, 2003).

VAR model form introduced by Lutkepohl (2005) as follow:

$$Y_t = A_1 y_{t-1} + \ldots + A_p y_{t-p} + B_0 x_t + \ldots + B_q x_{t-q} + CD_t + u_t \qquad \textbf{(15)}$$

Where, $Y_t = (y_{1t}, \ldots, y_{Kt})'$ is endogenous variables ;

$kx1$ vector, $x_t = (x_{1t}, \ldots, x_{Mt})'$ is exogeneous variables

$Mx1$ vector, all pre-determined variables are included in Dt

(linear trend, intercept)

u_t is normal distributed residual, white noise and average of zero.

covariance matrix = $E(u_t ut') = \Sigma_U$

coefficient matrices with dimensions = Ai, Bj *and* C

So, as form of 3 variables' vector, it can be shown;

$$\begin{bmatrix} \boldsymbol{y_t} \\ \boldsymbol{x_t} \\ \boldsymbol{m_t} \end{bmatrix} = \sum_{t=1}^{p} \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix} \begin{bmatrix} \boldsymbol{y_{t-1}} \\ \boldsymbol{x_{t-1}} \\ \boldsymbol{m_{t-1}} \end{bmatrix} \begin{vmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{32} & b_{33} \end{vmatrix} \begin{bmatrix} \boldsymbol{c} \\ \boldsymbol{s_{1t}} \\ \boldsymbol{s_{2t}} \\ \boldsymbol{t} \end{bmatrix} + \begin{bmatrix} \boldsymbol{u_t} \\ \boldsymbol{u_{2t}} \\ \boldsymbol{u_{3t}} \end{bmatrix} \qquad \textbf{(16)}$$

Another formation of VAR model contains K economic indicator variables can be shown;

$\boldsymbol{Y_t} = (\boldsymbol{Y_{1t}}, \boldsymbol{Y_{2t}}, \ldots, \boldsymbol{Y_{kt}})$ observed at time

$t = 0,1,2, \ldots, T$ and defined with order p as

$$\boldsymbol{Y_t} = \boldsymbol{\omega} + \boldsymbol{A_1 Y_{t-1}} + \boldsymbol{A_2 Y_{t-2}} + \ldots + \boldsymbol{A_p Y_{t-p}} + \boldsymbol{u_t} \qquad \textbf{(17)}$$

and $\boldsymbol{A_i}$ is $(K \times K)$ coefficient matrix for each $i = 1, 2, \ldots, p$.

The following assumptions are considered under model as shown above: **a)** stationarity, **b)** $\boldsymbol{u_t}$ is a K-dimensional white noise process with $E(\boldsymbol{u_t}) = 0$, $\boldsymbol{\omega} = (\omega_1, \omega_2, \ldots, \omega_K)'$ is a fixed $(K \times 1)$ vector of intercept let non-zero mean as a possibility, $E(\boldsymbol{Y_t})$, and **c)** $\boldsymbol{u_t}$ is time constant included positive covariance matrix (Gudeta, *et al.*, 2017)

Vector Error Correction Model (VEC)

As a multivariate time series, VEC model is a full information maximum likelihood estimation model and provides a more efficient estimator for cointegration vectors that allows a VEC to be tested in a system of all equations in one step without testing the normalization of a given variable. The term cointegration is known as the error correction term as the deviation from equilibrium is gradually corrected in the long run by a series of partial short-term adjustments. VEC has built cointegration relationships to model specification, thus long-term behavior of endogenous variables converges the cointegration relationships and provides short-term adjustment dynamics.

The regression equation form for VEC is as,

$$\Delta y_t = \alpha_1 + p_1 e_1 + \sum_{i=1}^{n} \beta_i \Delta y_t - i \sum_{i=1}^{n} \delta_i \Delta x_t - i + \sum_{i=1}^{n} \gamma_i \Delta z_t - i \quad \textbf{(18)}$$

$$\Delta x_t = \alpha_2 + p_2 e_i - 1 + \sum_{i=1}^{n} \beta_i \Delta y_t - i \sum_{i=1}^{n} \delta_i \Delta x_t - i + \sum_{i=1}^{n} \gamma_i \Delta z_t - i \quad \textbf{(19)}$$

where α_1 and α_2 is a constant.

The empirical methodology used in this study requires determining the degree of integration of each variable. Because, time series for economic data is generally stochastic or shows a non-stationary trend, ie the data has a root unit. Various statistical tests are applying for determining the degree of integration of a variable. Augmented Dickey-Fuller (ADF) or/and Philips Perron (PP) unit root tests is used as a part of methods used in this study. Phillips-Perron is a nonparametric alternative method which modifies the augmented Dickey-Fuller test, running the same regression by OLS but calculating different critical points in order to consider the possibility of serial correlation (Hamilton, 1994).

After finding the proper order of integration, next stage is optimum lag selection for VAR model. Schwarz Information Criterion, (SC)Akaike Information Criterion (AIC) or Hannan Quinn (HQ) are the criteria for determination number of lags (orders). VAR model stability is also tested in here before moving to cointegration test stage.

The testing the cointegration relationship depends on stationarity level. If stationarity is found at the first difference level, then necessarily brings to test possibility of cointegration to see the long-term balance between observed variables. Linear connection can provide stationarity when a data individually is not stationary. Then data becomes cointegrated. Johansen test is used for cointegration. Comparing to Engle and Granger’s (1987) two-step strategy, procedure of Johansen (1988) is more effective in case of the small sample and the high number of variables. In Johansen procedure, cointegration relationship is seen from the value of trace statistic and max eigen statistic. After run cointegration test, If results show cointegrating relationships, VEC is chosen. if results show no cointegrating relationship, VAR model is one to be proceed.

As a restricted form of VAR, VEC model defines cointegration relationships in order to nonstationary series. After determination of cointegration in the model, process continues to error correction method. Any integration difference degrees of variables are run jointly between the long-term by error correction equation, thus cointegration variable occurs. The integration degree of cointegrated variables is known Lee and Granger such multi cointegration (Suharsono, Aziza and Pramesti, 2017). After VEC test, VEC Granger Causality test is run to check causal relationships in short term. Then, Impulse Response Function (IRF) and Variance Decomposition are tested to interpret shocks and response and contribution of variable to each other in parameterized time periods. Finally, tests for Autocorrelation, Normality and Heteroscedasticity are done to check model structure regarding to residuals.

4.2.3. Model Specification and Procedure

In this investigation, VAR and VEC models are applied to analysis relationships between trade and growth. Macroeconomic variables mostly are not suitable for policy analysis and forecasting, as they have possibly nonstationary behavior and high persistence. Data must be stationary by using unit root tests that may have an intercept and/or a trend before proceeding to the VAR or VEC examination. Augmented Dickey-Fuller (ADF)) unit root test, Granger Causality test and Johansen cointegration test under the broader framework of Vector Error Correction (VEC) model are used to examine the dynamic relationship between GDP, export and import in both short-term and long-term, to find causality and direction between them. Impulse Response Functions (IRF) and Variance Decomposition are estimated to reveal supply and demand shocks of variables to each other over the time. Econometric calculations are made by using EViews 10 software.

Model specification;

$$\boldsymbol{ln(GDP)_{it} = \alpha_i + \beta_{it}\, ln(EX) + \beta_{it}\, ln(IM) + \varepsilon_t} \qquad \textbf{(20)}$$

The abbreviations for the data used are as follows;

lnGDP = log of GDP

lnEX = log of exports of goods and services.

lnIM = log of imports of goods and services

ARG: Argentina

BRA: Brazil

CHN: China

COL: Colombia

DOM: Dominican Republic

ECU: Ecuador

GRC: Greece

MYS: Malaysia

MEX: Mexico

PER: Peru

POL: Poland

ROU: Romania

THA: Thailand

TR: Turkey

The empirical methodology used in this study requires determining the degree of integration of each variable. Because, time series for economic data is generally stochastic or shows a non-stationary trend, ie the data has a root unit. Augmented Dickey-Fuller (ADF) or/and Philips Perron (PP) unit root tests were applied for determining the degree of integration of a variable. After finding the proper order of integration, next stage was optimum lag selection for VAR model. Schwarz Information Criterion, (SC)Akaike Information Criterion (AIC) or Hannan Quinn (HQ) are the criteria for determination number of lags (orders). Then, Johansen procedure conducted to determine presence of cointegration vectors in long run. After run cointegration test, if results showed cointegrating relationships. Thus, VEC Model was chosen. If results did not show cointegration, thus VAR model was chosen. VAR and VEC models define relationships in order to nonstationary series for long term, and also short-term estimations. After VEC test, VEC Granger Causality test was run to check causal relationships in short term. Then, Impulse Response Function (IRF) and Variance Decomposition were tested to interpret shocks and response and contribution of variable to each other in parameterized time periods. Finally, tests for Stability, Autocorrelation, Normality and Heteroscedasticity were done to check model structure regarding to residuals.

4.3. Results of Selected Countries

4.3.1. ARGENTINA

Table 13. Unit Root Tests and Optimal Lag Selection (Argentina)

	Variables	ADF Test Statistics (1st Difference)	5% Critical value	Deterministic Regressors	Results
Unit Root Tests	LGDP	-6.554635	-1.950394	none	stationary
	LEXP	-7.809740	-1.950394	none	stationary
	LIMP	-5.213955	-1.950394	none	stationary

	Lag	LogL	Lr	FPE	AIC	SC	HQ
Optimal Lag Selection	0	19.08428	NA	8.01e-05	-0.919102	-0.785786	-0.873081
	1	193.0309	308.1340	6.48e-09	-10.34462	-9.811361	-10.16054
	2	251.3230	93.26736	3.92e-10	-13.16131	-12.22811	-12.83917
	3	270.3320	27.15565*	2.29e-10*	-13.73326*	-12.40010*	-13.27305*

Table 14. Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.667074	61.87935	29.79707	0.0000
At most 1 *	0.435388	24.48492	15.49471	0.0017
At most 2 *	0.138025	5.049986	3.841466	0.0246

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.667074	37.39443	21.13162	0.0001
At most 1 *	0.435388	19.43494	14.26460	0.0070
At most 2 *	0.138025	5.049986	3.841466	0.0246

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

As seen from tables, all variables are stationary at first difference and optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility. Results of Johansen Cointegration test shows the long term cointegration as 3 cointegrating equations that leads to run VEC model test.

Table 15. VEC Granger Causality/Block Exogeneity Wald Tests (Argentina)

Null Hypothesis, H0	**chi2**	**Prob > chi2**	**H0**
lnGDP does not granger cause on lnExport	1.411755	0.4937	Accept
lnGDP does not granger cause on lnImport	**4.981877**	**0.0828***	**Reject***
lnExport does not granger cause on lnGDP	3.599270	0.1654	Accept
lnExport does not granger cause on lnImport	2.106506	0.3488	Accept
lnImport does not granger cause on lnGDP	**21.48295**	**0.0000****	**Reject****
lnImport does not granger cause on lnExport	1.378603	0.5019	Accept

VEC test reveals the causality from import (lag 1,2) to GDP and GDP (lag2) to import. VEC Granger Causality test indicates the causal directions from import to GDP in short term at 5% significance level.

Response of GDP to exports and imports shocks both are positive and increasingly in time. Imports shocks are almost 3 times more effective on GDP than exports shocks. Imports shocks have positive effects on Exports, but GDP shocks have declining negative effects by time. Exports shocks are positive and GDP shocks are negative on imports in time.

Variance Decomposition test results in GDP predicted variance; contribution of imports reaches to over 70% by time while exports have around 12% at same time sequence. In export predicted variance; GDP contributes up to over 70% in time whereas imports contribute up to 7% in time. In import predicted variance; contribution comes from imports itself over 65% in time. GDP contributes up to 9% and contribution of exports down to 23% by 10th period while it was 27% at first period.

4.3.2. BRAZIL

Table 16. Unit Root Test and Optimal Lag Selection (Brazil)

	Variables	ADF Test Statistics (1st Difference)	5% Critical value	Deterministic Regressors	Results	
Unit Root Tests	LGDP	-4.861398	-1.950394	none	stationary	
	LEXP	-5.765883	-1.950394	none	stationary	
	LIMP	-4.716723	-1.950394	none	stationary	
	Lag	**LogL**	**Lr**	**FPE**	**AIC**	**SC**	**HQ**
Optimal Lag Selection	0	-5.869460	NA	0.000338	0.521733	0.656412	0.567662
	1	91.52139	171.8662	1.87e-06	-4.677729	-4.139013	-4.494011
	2	132.4877	65.06412	2.90e-07	-6.558099	-5.615347	-6.236594
	3	165.4542	46.54091	7.34e-08	-7.967892	-6.621103	-7.508599
	4	188.6342	28.63411*	3.41e-08*	-8.802010*	-7.051184*	-8.204928*

As seen from tables, all variables are stationary at first difference and optimal lag selected as lag 4 based on AIC, SC, HQ and model diagnostics compatibility. Results of Johansen Cointegration test shows the long term cointegration as 2 cointegrating equations that leads to run VEC model test.

Table 17. Johansen Cointegration Test (Brazil)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.511000	43.04810	29.79707	0.0009
At most 1 *	0.385726	19.44013	15.49471	0.0120
At most 2	0.096773	3.358788	3.841466	0.0668

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.511000	23.60797	21.13162	0.0219
At most 1 *	0.385726	16.08134	14.26460	0.0255
At most 2	0.096773	3.358788	3.841466	0.0668

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

Table 18. VEC Granger Causality/Block Exogeneity Wald Tests

Null Hypothesis, H0	**chi2**	**Prob > chi2**	**H0**
lnGDP does not granger cause on lnExport	10.78853	0.0129	Reject**
lnGDP does not granger cause on lnImport	12.36012	0.0062	Reject**
lnExport does not granger cause on lnGDP	15.73536	0.0013	Reject**
lnExport does not granger cause on lnImport	8.067774	0.0446	Reject**
lnImport does not granger cause on lnGDP	11.44205	0.0096	Reject**
lnImport does not granger cause on lnExport	2.117948	0.5483	Accept

VEC test reveals the causality from export (lag 1,2,3) and import (lag 1,2) to GDP and GDP (lag2) to import. Also, export causes to import by lag 2. VEC Granger Causality test indicates the causal directions from export and import to GDP in short term. Besides this, there are causality relationships come from GDP to both export and import. Another causal direction is caused by export to import at 5% significance level.

Response of GDP to exports shocks are positive and increasing gradually until 4th period. By 5th period, there is acceleration in increasing trend until 9th period. Imports shocks have gradually increasing positive effect at firs periods on GDP responses. By 9th period, it goes down below the zero and becomes negative effect. Imports shocks have negative effects on Exports, but GDP shocks have declining positive effects by time. Exports and GDP shocks are positive on imports. Exports shocks start an increasing trend at 6th period and go higher than effects of GDP shocks on import in time.

Variance Decomposition test results in GDP predicted variance; contribution of imports reaches to around 9% then go back initial level 3% by time while exports increase to 56% at same time sequence. In export predicted variance; GDP contributes up to over 33% in 5th period then go down to 18% in the end of 10th period whereas imports contribute around 2% all over the time periods. In import predicted variance; contribution comes from GDP starts 44% to 56% in time. Exports contribution comes back to initial level around 30% in time.

4.3.3. COLOMBIA

Table 19. Unit Root Test and Optimal Lag Selection (Colombia)

	Variables	ADF Test Statistics (1st Difference)	5% Critical value	Deterministic Regressors	Results
Unit Root Tests	LGDP	-3.880902	-1.950394	none	stationary
	LEXP	-4.625942	-1.950394	none	stationary
	LIMP	-3.562323	-1.950394	none	stationary

	Lag	LogL	Lr	FPE	AIC	SC	HQ
Optimal Lag Selection	0	38.48275	NA	2.49e-05	-2.087220	-1.952542	-2.041291
	1	226.1296	331.1415	6.82e-10	-12.59586	-12.05714	-12.41214
	2	310.5823	134.1307	8.17e-12	-17.03425	-16.09150	-16.71274
	3	337.3867	37.84154*	2.97e-12*	-18.08157	-16.73478*	-17.62228*

Table 20. Johansen Cointegration Test (Colombia)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.581003	50.03347	29.79707	0.0001
At most 1 *	0.339113	20.45717	15.49471	0.0082
At most 2 *	0.170978	6.375310	3.841466	0.0116

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.581003	29.57630	21.13162	0.0026
At most 1	0.339113	14.08186	14.26460	0.0534
At most 2 *	0.170978	6.375310	3.841466	0.0116

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

As seen from tables, all variables are stationary at first difference and optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility. Results of Johansen Cointegration test shows the long term cointegration as 3 cointegrating equations in trace test that leads to run VEC model test.

VEC test reveals the causality from import (lag 1,2) to GDP and GDP (lag1,2) to import. Also, import causes to export by lag 1 while GDP (lag1) causes to export. VEC Granger Causality test indicates the bilateral causal directions between import and GDP in short term. Besides this, there are causality relationships come from export to import at 5% significance level.

Table 21. VEC Granger Causality Test (Colombia)

Null Hypothesis, H0	chi2	Prob > chi2	H0
lnGDP does not granger cause on lnExport	4.753699	0.0928	Reject*
lnGDP does not granger cause on lnImport	22.00376	0.0000	Reject**
lnExport does not granger cause on lnGDP	2.979697	0.2254	Accept
lnExport does not granger cause on lnImport	8.231373	0.0163	Reject**
lnImport does not granger cause on lnGDP	10.83338	0.0044	Reject**
lnImport does not granger cause on lnExport	3.368620	0.1856	Accept

Response of GDP to exports shocks are positive and has an increasing trend over time. Imports shocks have negative effect on GDP responses. GDP shocks have major effect on GDP responses positively. Imports shocks have negative effects on Exports, but GDP shocks have positive effects on exports by time. Export and GDP shocks are positive on imports.

Variance Decomposition test results in GDP predicted variance; contribution of imports reaches to around 10% by time while exports increase to 13% at same time sequence. GDP is the major contribution for itself by average 80% over the time. In export predicted variance; GDP contributes in average 65% in time whereas imports contribute around 5% all over the time periods. In import predicted variance; contribution comes from GDP starts 76% to 67% in time. Exports contribution rises to around 27%.

4.3.4. DOMINICAN REPUBLIC

Table 22. Unit Root Test and Optimal Lag Selection (Dominican R.)

	Variables	ADF Test Statistics (1st Difference)	5% Critical value	Deterministic Regressors	Results
Unit Root Tests	LGDP	-6.638634	-1.950394	none	stationary
	LEXP	-8.573578	-1.950394	constant	stationary
	LIMP	--8.079288	-1.950394	none	stationary

	Lag	LogL	Lr	FPE	AIC	SC	HQ
Optimal Lag Selectio n	0	26.07527	NA	5.17e-05	-1.357369	-1.222690	-1.311440
	1	89.61183	112.1233	2.10e-06	-4.565402	-4.026686	-4.381684
	2	108.6155	30.18230	1.18e-06	-5.153853	-4.211101	-4.832347
	3	127.1332	26.14258	6.99e-07	-5.713715	-4.366926	-5.254422
	4	143.8557	20.65720*	4.76e-7*	-6.16798*	-4.41715*	-5.57089*

As seen from tables, all variables are stationary at first difference and optimal lag selected as lag 4 based on AIC, SC, HQ and model diagnostics compatibility. Results of Johansen Cointegration test shows the long term cointegration as 1 cointegrating equations that leads to run VEC model test.

Table 23. Johansen Cointegration Test (Dominican R.)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.544589	40.81340	29.79707	0.0018
At most 1	0.276721	14.85706	15.49471	0.0622
At most 2 *	0.118608	4.166347	3.841466	0.0412
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.544589	25.95634	21.13162	0.0097
At most 1	0.276721	10.69071	14.26460	0.1704
At most 2 *	0.118608	4.166347	3.841466	0.0412
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

Table 24. VEC Granger Causality Test/Block Exogeneity Wald Tests (Dominican R.)

Null Hypothesis, H0	**chi2**	**Prob > chi2**	**H0**
lnGDP does not granger cause on lnExport	**37.59268**	**0.0000**	**Reject****
lnGDP does not granger cause on lnImport	**29.60370**	**0.0000**	**Reject****
lnExport does not granger cause on lnGDP	3.027936	0.3873	Accept
lnExport does not granger cause on lnImport	1.242745	0.7428	Accept
lnImport does not granger cause on lnGDP	**10.21622**	**0.0168**	**Reject****
lnImport does not granger cause on lnExport	**31.48575**	**0.0000**	**Reject****

VEC test reveals the causality from import (lag 1) to GDP and GDP (lag1,2,3) to import. Also, import causes to export by lag 1and 2 while GDP (lag1) causes to export. VEC Granger Causality test indicates the bilateral causal directions between import and GDP in short term. Besides this, there are causality relationships come from import to export at 5% significance level.

Impulse Response Functions (IRF) show that response of GDP to export shocks are positive and has an increasing trend over time. Import shocks have negative effect on GDP responses. GDP shocks have major effect on GDP responses positively. Import shocks have negative effects on Exports, but GDP shocks have positive effects on exports by time. GDP shocks have major effect on imports responses positively. Export shocks have positive also but weak effect on imports.

Variance Decomposition test results in GDP predicted variance; contribution of import reaches to around 20% by time while export increases to 6% at same time sequence. GDP is the major contribution for itself by over 73% over the time. In export predicted variance; GDP contributes in average 38% in time whereas import contributes around 33% all over the time periods. In import predicted variance; contribution comes from GDP starts 75% to 93% in time. Export contribution is around 2%.

4.3.5. ECUADOR

Table 25. Unit Root Test and Optimal Lag Selection (Ecuador)

	Variables	ADF Test Statistics (1st Difference)	5% Critical value	Deterministic Regressors	Results
Unit Root Tests	LGDP	-3.846639	-1.950394	none	stationary
	LEXP	-5.053803	-1.950394	none	stationary
	LIMP	-5.688559	-1.950394	none	stationary

	Lag	LogL	Lr	FPE	AIC	SC	HQ
Optimal Lag Selection	0	40.62152	NA	2.20e-05	-2.213030	-2.078352	-2.167101
	1	222.7525	321.4076	8.32e-10	-12.39721	-11.85849	-12.21349
	2	262.7669	63.55231	1.36e-10	-14.22158	-13.27883	-13.90008
	3	282.8076	28.2926*	7.37e-11	-14.87103	-13.5242*	-14.41174
	4	295.2267	15.34124	6.46e-1*	-15.0721*	-13.32133	-14.4757*

Table 26. Johansen Cointegration Test (Ecuador)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.495565	44.01921	29.79707	0.0006
At most 1 *	0.318130	21.43675	15.49471	0.0056
At most 2 *	0.234083	8.800496	3.841466	0.0030

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.495565	22.58246	21.13162	0.0310
At most 1	0.318130	12.63625	14.26460	0.0890
At most 2 *	0.234083	8.800496	3.841466	0.0030

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

As seen from tables, all variables are stationary at first difference and optimal lag selected as lag 4 based on AIC, SC, HQ and model diagnostics compatibility. Results of Johansen Cointegration test shows the long term cointegration as 3 cointegrating equations that leads to run VEC model test.

VEC test reveals the causality from import (lag 1,2) to GDP. Also, export causes to GDP by lag 1and 2. VEC Granger Causality test indicates causal directions from import to GDP in short term. Besides this, there is causality relationship that comes from GDP to export at 5% significance level.

Table 27. VEC Granger Causality/Block Exogeneity Wald Tests (Ecuador)

Null Hypothesis, H0	**chi2**	**Prob > chi2**	**H0**
lnGDP does not granger cause on lnExport	**9.412714**	**0.0243**	**Reject****
lnGDP does not granger cause on lnImport	5.958250	0.1137	Accept
lnExport does not granger cause on lnGDP	4.405338	0.2209	Accept
lnExport does not granger cause on lnImport	1.586963	0.6623	Accept
lnImport does not granger cause on lnGDP	**12.82538**	**0.0050**	**Reject****
lnImport does not granger cause on lnExport	2.723569	0.4362	Accept

Impulse Response Functions (IRF) show that response of GDP to exports shocks are positive and has an increasing trend over time. Imports shocks have negative effect on GDP until 6th period then becomes positive and increasing trend. Imports and GDP shocks have positive effects on Exports. Imports shocks have increasing trend and go above GDP shocks. GDP and exports shocks have positive effect and increasing trend on import.

Variance Decomposition test results in GDP predicted variance; contribution of exports reaches to above 60% by time while imports increase to 8% at same time sequence. Exports shocks are the major contribution for GDP over the time. In export predicted variance; GDP contributes exports from 23% to 26% in time whereas imports contribute up to 17% all over the time periods. In import predicted variance; contribution comes from Export by up to 47% in time. GDP contribution is around 12%.

4.3.6. GREECE

Table 28. Unit Root Test and Optimal Lag Selection (Greece)

	Variables	**ADF Test Statistics** (1st Difference)	**5% Critical value**	**Deterministic Regressors**	**Results**
Unit Root Tests	LGDP	-3.890887	-1.950394	none	stationary
	LEXP	-4.753300	-1.950394	none	stationary
	LIMP	-4.559968	-1.950394	none	stationary

	Lag	**LogL**	**Lr**	**FPE**	**AIC**	**SC**	**HQ**
Optimal Lag Selection	0	55.92411	NA	8.92e-06	-3.113183	-2.978504	-3.067254
	1	244.0509	331.9885	2.38e-10	-13.65005	-13.11134	-13.46634
	2	328.4885	134.1068	2.85e-12	-18.08756	-17.14481	-17.76605
	3	349.6849	29.9243*	1.44e-2*	-18.8050*	-17.4581*	-18.3450*
	4	357.4506	9.592881	1.66e-12	-18.73239	-16.98156	-18.13531

As seen from tables, all variables are stationary at first difference and optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility. Results of Johansen Cointegration test shows the long term cointegration as 3 cointegrating equations that leads to run VEC model test.

Table 29. Johansen Cointegration Test (Greece)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.610688	49.25687	29.79707	0.0001
At most 1 *	0.258709	17.18213	15.49471	0.0276
At most 2 *	0.186162	7.003797	3.841466	0.0081
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.610688	32.07474	21.13162	0.0010
At most 1	0.258709	10.17833	14.26460	0.2005
At most 2 *	0.186162	7.003797	3.841466	0.0081
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

VEC test reveals the causality from export (lag 2) to GDP. VEC Granger Causality test indicates causal directions from import and export to GDP in short term.

Table 30. VEC Granger Causality/Block Exogeneity Wald Tests (Greece)

Null Hypothesis, H0	**chi2**	**Prob > chi2**	**H0**
lnGDP does not granger cause on lnExport	0.356810	0.8366	Accept
lnGDP does not granger cause on lnImport	3.145700	0.2075	Accept
lnExport does not granger cause on lnGDP	**10.04869**	**0.0066**	**Reject** **
lnExport does not granger cause on lnImport	3.611853	0.1643	Accept
lnImport does not granger cause on lnGDP	**8.438275**	**0.0147**	**Reject** **
lnImport does not granger cause on lnExport	0.061484	0.9697	Accept

Impulse Response Functions (IRF) show that response of GDP to imports shocks are positive and has an increasing trend over time. Exports shocks are also positive and have increasing trend. Imports shocks are 2 times more effective than export shocks. Imports and GDP shocks have positive effects on Exports. Imports shocks have increasing trend and go above GDP shocks. Exports shocks have positive effect and increasing trend on import. GDP shocks are also positive but in a declining trend.

Variance Decomposition test results in GDP predicted variance; contribution of imports reaches to above 70% by time while exports increase to around 22% at same time sequence. Imports shocks are the major contribution for GDP over the time. In export predicted variance; contribution of GDP decreases from 47% to 25% in time whereas import contribute up to 22% all over the time periods. In import predicted variance; contribution comes from Export up to 38% then go back to 33% in time. GDP contribution is around 9%. Import shocks are the major contribution of itself.

4.3.7. MALAYSIA

Table 31. Unit Root Test and Optimal Lag Selection (Malaysia)

	Variables	ADF Test Statistics (1st Difference)	5% Critical value	Deterministic Regressors	Results
Unit Root Tests	LGDP	-4.655674	-1.950394	none	stationary
	LEXP	-4.398405	-1.950394	none	stationary
	LIMP	-4.146784	-1.950394	none	stationary

	Lag	LogL	Lr	FPE	AIC	SC	HQ
Optimal Lag Selection	0	17.73188	NA	8.44e-05	-0.866581	-0.731902	-0.820652
	1	168.4714	266.0108	2.03e-08	-9.204197	-8.665482	-9.020480
	2	230.5345	98.57092	9.07e-10	-12.32556	-11.38281	-12.00405
	3	251.4780	29.56722	4.65e-10	-13.02812	-11.68133	-12.56882
	4	276.1046	30.42111*	1.99e-0*	-13.9433*	-12.1960*	-13.3525*

Table 32. Johansen Cointegration Test (Malaysia)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.634885	65.64179	29.79707	0.0000
At most 1 *	0.468406	32.39284	15.49471	0.0001
At most 2 *	0.295119	11.54095	3.841466	0.0007

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.634885	33.24895	21.13162	0.0006
At most 1 *	0.468406	20.85189	14.26460	0.0040
At most 2 *	0.295119	11.54095	3.841466	0.0007

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

As seen from tables, all variables are stationary at first difference and optimal lag selected as lag 4 based on AIC, SC, HQ and model diagnostics compatibility. Results of Johansen Cointegration test shows the long term cointegration as 3 cointegrating equations that leads to run VEC model test.

VEC test reveals the bilateral causality between import (lag 1,2,3) and GDP (lag 1,2,3). Also, GDP causes export to by lag 3 and there is causal direction from import (lag 2) to export. VEC Granger Causality test also indicates bilateral causal directions between import and GDP in short term. Besides this, there are causalities from GDP to export and from import to export at 5% significance level.

Table 33. VEC Granger Causality/Block Exogeneity Wald Tests (Malaysia)

Null Hypothesis, H0	chi2	Prob > chi2	H0
lnGDP does not granger cause on lnExport	**12.52089**	**0.0058**	**Reject****
lnGDP does not granger cause on lnImport	**20.81063**	**0.0001**	**Reject****
lnExport does not granger cause on lnGDP	2.296609	0.5132	Accept
lnExport does not granger cause on lnImport	4.698701	0.1952	Accept
lnImport does not granger cause on lnGDP	**28.07530**	**0.0000**	**Reject****
lnImport does not granger cause on lnExport	**26.15014**	**0.0000**	**Reject****

Impulse Response Functions (IRF) show that response of GDP to impors and export shocks are positive and has an increasing trend over time by following each other. Import shocks have positive effects on Exports. GDP shocks have declining negative effect on Export. On the other hand, export shocks have positive effect and increasing trend on import. GDP shocks have negative effect in a declining trend.

Variance Decomposition test results in GDP predicted variance; contribution of import reaches to above 34% by time while export increases to around 24% at same time sequence. GDP puts the major contribution for itself over the time. In export predicted variance; contribution of GDP increases up to 16% in time whereas imports contribute up to 60% all over the time periods. In import predicted variance; contribution comes from Export is up to 23% in time. GDP contribution is around 14%. Imports have the major contribution of itself.

4.3.8. MEXICO

Table 34. Unit Root Test and Optimal Lag Selection (Mexico)

	Variables	ADF Test Statistics (1st Difference)	5% Critical value	Deterministic Regressors	Results
Unit Root Tests	LGDP	-5.397031	-1.950394	none	stationary
	LEXP	-4.446094	-1.950394	none	stationary
	LIMP	-4.928556	-1.950394	none	stationary

	Lag	LogL	Lr	FPE	AIC	SC	HQ
Optimal Lag Selection	0	17.47770	NA	8.78e-05	-0.827297	-0.693982	-0.781277
	1	173.3510	276.1184	1.99e-08	-9.220057	-8.686794	-9.035975
	2	227.9641	87.38098	1.49e-09	-11.82652	-10.8931*	-11.50438
	3	242.7631	21.1415*	1.11e-9*	-12.1579*	-10.82473	-11.6978*

Table 35. Johansen Cointegration Test (Mexico)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.435212	34.38969	29.79707	0.0138
At most 1	0.342995	14.96531	15.49471	0.0600
At most 2	0.019893	0.683170	3.841466	0.4085
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.435212	19.42438	21.13162	0.0852
At most 1 *	0.342995	14.28214	14.26460	0.0497
At most 2	0.019893	0.683170	3.841466	0.4085
Max-eigenvalue test indicates no cointegrating eqn(s) at the 0.05 level				

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

As seen from tables, all variables are stationary at first difference and optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility. Results of Johansen Cointegration test shows the long term cointegration as 1 cointegrating equations that leads to run VEC model test.

VEC test reveals the bilateral causality between import (lag 1) and GDP (lag 2). Also, import causes export to by lag 1. VEC Granger Causality test also indicates bilateral causal directions between import and GDP in short term. Besides this, there is causality from export to GDP at 5% significance level.

Table 36. VEC Granger Causality/Block Exogeneity Wald Tests (Mexico)

Null Hypothesis, H0	chi2	Prob > chi2	H0
lnGDP does not granger cause on lnExport	0.397811	0.8196	Accept
lnGDP does not granger cause on lnImport	10.19316	0.0061	Reject**
lnExport does not granger cause on lnGDP	15.61323	0.0004	Reject**
lnExport does not granger cause on lnImport	2.561738	0.2778	Accept
lnImport does not granger cause on lnGDP	8.940116	0.0114	Reject**
lnImport does not granger cause on lnExport	4.812240	0.0902	Reject*

Impulse Response Functions (IRF) show that response of GDP to import and export shocks are positive and has an increasing trend over time. Yet, export shocks are 3 times more effective than import shocks. Import and GDP shocks have positive effects on export with a close range to each other. Export shocks have significant positive effect on import. GDP shocks have negative effect by levels just below the zero.

Variance Decomposition test results in GDP predicted variance; contribution of exports reaches to above 74% by time while import increases to around 5% at same time sequence. Export is the main contributor for GDP over the time. In export predicted variance; contribution of GDP and import increases up to 6% and 8%, respectively. Export is the main contributor to itself. In import predicted variance; contribution comes from export is up to 72% in time. GDP contribution is around 3%. Export has the major contribution for imports.

4.3.9. PERU

Table 37. Unit Root Test and Optimal Lag Selection (Peru)

	Variables	**ADF Test Statistics** (1st Difference)	**5% Critical value**	**Deterministic Regressors**	**Results**	
Unit Root Tests	LGDP	-5.942715	-1.950394	none	stationary	
	LEXP	-4.836466	-1.950394	none	stationary	
	LIMP	-4.430325	-1.950394	none	stationary	
	Lag	**LogL**	**Lr**	**FPE**	**AIC**	**SC**	**HQ**
Optimal Lag Selection	0	0.854042	NA	0.000228	0.126233	0.260912	0.172162
	1	109.3707	191.4999	6.55e-07	-5.727687	-5.188971	-5.543969
	2	159.1774	79.10479	6.03e-08	-8.128082	-7.18530*	-7.806577
	3	174.6220	21.80415*	4.28e-08	-8.507176	-7.160388	-8.047883
	4	186.2715	14.39060	3.92e-8*	-8.66301*	-6.912206	-8.06590*

Table 38. Johansen Cointegration Test (Peru)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.631817	47.59821	29.79707	0.0002
At most 1	0.250914	14.62543	15.49471	0.0673
At most 2 *	0.142980	5.091699	3.841466	0.0240

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.631817	32.97277	21.13162	0.0007
At most 1	0.250914	9.533733	14.26460	0.2444
At most 2 *	0.142980	5.091699	3.841466	0.0240

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

As seen from tables, all variables are stationary at first difference and optimal lag selected as lag 4 based on AIC, SC, HQ and model diagnostics compatibility. Results of Johansen Cointegration test shows the long term cointegration as 1 cointegrating equations that leads to run VEC model test.

VEC test reveals the causalities from GDP (lag 2,3) to both import and export. Also, there is bilateral causal directions between export (lag 1,2,3) and import (1,2). VEC Granger Causality test also indicates bilateral causal directions between import and export in short term. Besides this, there are causalities from GDP to both import and export at 5% significance level.

Table 39. VEC Granger Causality/Block Exogeneity Wald Tests (Peru)

Null Hypothesis, H0	chi2	Prob > chi2	H0
lnGDP does not granger cause on lnExport	45.60247	0.0000	Reject**
lnGDP does not granger cause on lnImport	49.77082	0.0000	Reject**
lnExport does not granger cause on lnGDP	0.999800	0.8013	Accept
lnExport does not granger cause on lnImport	23.45821	0.0000	Reject**
lnImport does not granger cause on lnGDP	4.430227	0.2186	Accept
lnImport does not granger cause on lnExport	41.97820	0.0000	Reject**

Impulse Response Functions (IRF) show that response of GDP to export shocks are positive and has gradual increasing trend over time. Yet, import shocks have negative effect on GDP with a declining trend. GDP shocks have significantly positive effect on export. But import shocks have weak positive effects on exports over the time. Export shocks have weak positive effect on import while GDP shocks have significantly positive effect as similar as export responses.

Variance Decomposition test results in GDP predicted variance; contribution of exports reaches to above 10% by time whereas imports increase to around 10% at same time sequence. GDP is the main contributor for itself over the time. In export predicted variance; contribution of GDP and import increases up to 86% and 5%, respectively. GDP is the main contributor to export. In import predicted variance; contribution comes from GDP is up to 90% in time. Exports contribution is around 5%. GDP has the major contribution for imports.

4.3.10. POLAND

Table 40. Unit Root Test and Optimal Lag Selection (Poland)

	Variables	ADF Test Statistics (1st Difference)	5% Critical value	Deterministic Regressors	Results	
Unit Root Tests	LGDP	-4.655319	-2.981038	Constant	stationary	
	LEXP	-5.145184	-2.981038	Constant	stationary	
	LIMP	- 5.571663	-2.981038	Constant	stationary	
Optimal Lag Selection	**Lag**	**LogL**	**Lr**	**FPE**	**AIC**	**SC**	**HQ**
	0	43.44096	NA	1.00e-05	-2.995627	-2.851645	-2.952814
	1	206.8278	278.3628	1.09e-10	-14.43169	-13.85576	-14.26044
	2	318.7719	165.8431	5.48e-14	-22.05718	-21.04931	-21.75749
	3	336.8071	22.7109*	3.03e-4*	-22.7264*	-21.2866*	-22.2982*

Table 41. Johansen Cointegration Test (Poland)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.740741	71.31741	29.79707	0.0000
At most 1 *	0.539822	36.21933	15.49471	0.0000
At most 2 *	0.460390	16.03963	3.841466	0.0001
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.740741	35.09808	21.13162	0.0003
At most 1 *	0.539822	20.17970	14.26460	0.0052
At most 2 *	0.460390	16.03963	3.841466	0.0001
Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level				

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

As seen from tables, all variables are stationary at first difference and optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility. Results of Johansen Cointegration test shows the long term cointegration as 3 cointegrating equations that leads to run VEC model test.

Table 42. VEC Granger Causality/Block Exogeneity Wald Tests (Poland)

Null Hypothesis, H0	chi2	Prob > chi2	H0
lnGDP does not granger cause on lnExport	22.22573	0.0000	Reject**
lnGDP does not granger cause on lnImport	4.258176	0.1189	Accept
lnExport does not granger cause on lnGDP	16.65748	0.0002	Reject**
lnExport does not granger cause on lnImport	8.488810	0.0143	Reject**
lnImport does not granger cause on lnGDP	8.190874	0.0166	Reject**
lnImport does not granger cause on lnExport	7.777404	0.0205	Reject**

VEC test reveals that there is bilateral causal directions between export (lag 2) and GDP (lag 2). Another bilateral causality is between import (lag2) and export (lag 2). VEC Granger Causality test also indicates bilateral causal directions between import and export in short term while GDP causes to export. Besides this, there are causalities from export and import to GDP at 5% significance level.

Impulse Response Functions (IRF) show that response of GDP to export and import shocks are positive and has gradual increasing trend over time. Yet, GDP shocks have higher positive effect on itself. GDP shocks have significantly increasing positive effect on export. Import shocks have weaker positive effects on exports over the time. GDP shocks have significantly increasing positive effect on import. Export shocks have weaker positive effect on import while GDP shocks have significantly increasing positive effect as similar as export responses.

Variance Decomposition test results in GDP predicted variance; contribution of export reaches to above 9% by time whereas import increases to around 9% at same time sequence. GDP is the main contributor for itself over the time. In export predicted variance; contribution of GDP starts with 77% to 67% while import increases up to 8%. GDP is the main contributor to export. In import predicted variance; contribution comes from GDP is around 77% in time. Export contribution increases up to 8%. GDP has the major contribution for import.

4.3.11. ROMANIA

Table 43. Unit Root Test and Optimal Lag Selection (Romania)

	Variables	ADF Test Statistics (1st Difference)	5% Critical value	Deterministic Regressors	Results
Unit Root Tests	LGDP	-3.519080	-1.954414	None	stationary
	LEXP	-6.734016	- 2.981038	Constant	stationary
	LIMP	-5.737827	-1.954414	None	stationary

	Lag	LogL	Lr	FPE	AIC	SC	HQ
Optimal Lag Selection	0	48.41668	NA	6.10e-06	-3.493591	-3.348426	-3.451788
	1	185.6674	232.2704	3.19e-10	-13.35903	-12.77837	-13.19182
	2	218.5690	48.08697*	5.25e-11	-15.19762	-14.18146*	-14.90500
	3	231.7124	16.17645	4.15e-11*	-15.5163*	-14.06469	-15.0983*

Table 44. Johansen Cointegration Test (Romania)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.781216	62.64219	29.79707	0.0000
At most 1 *	0.576949	24.65043	15.49471	0.0016
At most 2	0.118169	3.143865	3.841466	0.0762
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.781216	37.99176	21.13162	0.0001
At most 1 *	0.576949	21.50656	14.26460	0.0030
At most 2	0.118169	3.143865	3.841466	0.0762
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level				

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

As seen from tables, all variables are stationary at first difference and optimal lag selected as lag 3 based on AIC, SC, HQ and model diagnostics compatibility. Results of Johansen Cointegration test shows the long term cointegration as 2 cointegrating equations that leads to run VEC model test.

Table 45. VEC Granger Causality/Block Exogeneity Wald Tests (Romania)

Null Hypothesis, H0	chi2	Prob > chi2	H0
lnGDP does not granger cause on lnExport	1.678254	0.4321	Accept
lnGDP does not granger cause on lnImport	0.315585	0.8540	Accept
lnExport does not granger cause on lnGDP	6.623716	0.0364	Reject**
lnExport does not granger cause on lnImport	9.073874	0.0107	Reject**
lnImport does not granger cause on lnGDP	5.350722	0.0689	Reject*
lnImport does not granger cause on lnExport	2.155813	0.3403	Accept

VEC test reveals that there is causal direction from import (lag 1) to GDP. Another causality comes from export (lag 2) to import. VEC Granger Causality test indicates causal directions from export and import to GDP. Besides this, there is causality from export to import at 5% significance level.

Impulse Response Functions (IRF) show that response of GDP to export shocks are positive and has significantly increasing trend over time by following GDP shocks. Yet, import shocks have weaker positive effect on GDP. GDP shocks have significantly increasing positive effect on export close the effect of export shocks. Import shocks have weaker positive effects on export over the time. GDP and export shocks have significantly increasing positive effect on import with a similar trend path.

Variance Decomposition test results in GDP predicted variance; contribution of export reaches to above 48% by time whereas import increase to around 1% at same time sequence. GDP and export are the main contributors for GDP over the time. In export predicted variance; contribution of GDP increases up to 37% while import contributes around 1%. Export is the main contributors to itself by 62%. In import predicted variance; contribution comes from GDP increases up to 43% in time. Export contribution increases up to 56%. GDP and export have the major contribution for import.

4.3.12. THAILAND

Table 46. Unit Root Test and Optimal Lag Selection (Thailand)

	Variables	**ADF Test Statistics** (1st Difference)	**5% Critical value**	**Deterministic Regressors**	**Results**
Unit Root Tests	LGDP	-3.375693	1.950687	None	stationary
	LEXP	3.060736	1.950687	None	stationary
	LIMP	-4.096968	1.950687	None	stationary

	Lag	**LogL**	**Lr**	**FPE**	**AIC**	**SC**	**HQ**
Optimal Lag Selection	0	12.95612	NA	0.000112	-0.585654	-0.450975	-0.539725
	1	118.7413	186.6797	3.78e-07	-6.278900	-5.740184*	-6.095182
	2	133.8517	23.99895*	2.68e-07*	-6.638338*	-5.695586	-6.316833*
	3	138.8502	7.056658	3.51e-07	-6.402954	-5.056165	-5.943660

As seen from tables, all variables are stationary at first difference and optimal lag selected as lag 2 based on AIC, SC, HQ and model diagnostics compatibility. Results of Johansen Cointegration test shows there is no cointegrating equations in long term that leads to run VAR model test.

Table 47. Johansen Cointegration Test (Thailand)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.421563	26.43815	29.79707	0.1161
At most 1	0.134711	7.825659	15.49471	0.4842
At most 2	0.081924	2.906145	3.841466	0.0882
Trace test indicates no cointegrating eqn(s) at the 0.05 level				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.421563	18.61249	21.13162	0.1086
At most 1	0.134711	4.919514	14.26460	0.7520
At most 2	0.081924	2.906145	3.841466	0.0882
Max-eigenvalue test indicates no cointegrating eqn(s) at the 0.05 level				

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

VAR test reveals that there are causal directions from GDP (lag 1,2) to both import and export. Also, there is a bilateral causality between export (lag 1) to import (lag 1). VAR Granger Causality test indicates causal directions from GDP to both export and import. Besides, there is bilateral causality between export and import at 5% significance level.

Table 48. VAR Granger Causality/Block Exogeneity Wald Tests (Thailand)

Null Hypothesis, H0	**chi2**	**Prob > chi2**	**H0**
lnGDP does not granger cause on lnExport	6.771468	0.0339	Reject**
lnGDP does not granger cause on lnImport	17.89649	0.0001	Reject**
lnExport does not granger cause on lnGDP	2.642529	0.2668	Accept
lnExport does not granger cause on lnImport	22.14870	0.0000	Reject**
lnImport does not granger cause on lnGDP	3.133579	0.2087	Accept
lnImport does not granger cause on lnExport	5.072863	0.0791	Reject*

VAR test reveals that there are causal directions from GDP (lag 1,2) to both import and export. Also, there is a bilateral causality between export (lag 1) to import (lag 1). VAR Granger Causality test indicates causal directions from GDP to both export and import. Besides this, there is bilateral causality between export and import at 5% significance level.

Impulse Response Functions (IRF) show that response of GDP to export shocks are positive and has gradual increasing trend over time. Yet, import shocks have negative effect on GDP. GDP shocks have decreasing positive effect on export. Import shocks have negative effects on export over the time. Export shocks have gradually increasing positive effect on imports. GDP has brief increasing positive effect initially. Yet, then it decreases to zero level.

Variance Decomposition test results in GDP predicted variance; contribution of export reaches to above 24% by time whereas import increases to around 4% at same time sequence. GDP is the main contributor for itself by 71% over the time. In export predicted variance; contribution of GDP decreases from 57% to 30% while import contributes up to 10%. Export is the main contributors to itself by 59%. In import predicted variance; contribution comes from GDP increases to 83% in second period then decreases to 45% by 10th period. Export contribution increases up to 44%. GDP and export have the major contribution for import.

Summary and Discussion

In previous chapter, we examined relationship between trade and economic growth for China and Turkey after trade liberalization. As we have stated before, while China followed its trade liberalization approach, Turkey followed the Washington Consensus approach. In this respect, our findings provide inferences about the impacts of two different trade liberalization approaches. Empirical analysis suggested that exports are engine of GDP growth for both countries after decision of trade liberalization. In addition, imports promote exports growth for China, and it is reversed for Turkey. Another important result that should be underlined among the findings is that imports lead to economic growth in Turkey. In order to interpret these findings at a macro level, it is useful to look at the relationship between trade and GDP in other developing countries to draw a frame. This creates opportunity to observe global view of China's approach and Washington consensus approach. So, in this chapter, we run same econometric analysis for some developing countries which are Argentina, Brazil, Colombia, Dominican Republic, Ecuador, Greece, Malaysia, Mexico, Peru, Poland, Romania and Thailand. These countries were selected considering the following four criteria: 1) Middle income countries due to different stage of development may call for different of strategies of development. 2) Countries population were over 10 million in the year 2017 to avoid low population countries. Low population countries have limited resources, not competitive domestic market and high degree of dependency to international trade. 3) Countries liberalizing trade. The reason was to observe dynamics relationship between trade and growth with high degree of participation to international trade. 4) Excluding countries such as Russia and Kazakhstan where most of their exports are made up of natural gas. Cuba is also excluded due to the long term and strict embargo by USA and majority of industrialized countries. Another common point of the selected countries is that they carried out trade liberalization and economic liberalization under the influence or guidance of the Washington Consensus policy recommendations. So, this analysis gives the opportunity of drawing a general framework regarding of trade liberalization policy choice.

The most striking result in empirical analysis results is causality from imports to GDP, valid for almost all countries with exports to GDP causality. China is only exception in terms of having exports causal direction to GDP without imports causality. Brazil, Colombia, Dominican Republic, Ecuador, Malaysia, Peru, Poland and Thailand have causality from GDP to export. Imports caused GDP is valid for all countries except China, Peru and Thailand. There is bilateral causal relationship between export and import for Colombia, Peru, Poland and Thailand. One-way direction from imports to exports holds true for China, Dominican Republic, Malaysia and Mexico. The opposite way round applies for Brazil, Romania and Turkey that means causality comes from export to import for these countries. Argentina, Brazil, Colombia, Dominican Republic, Malaysia, Mexico and Peru have causal direction from GDP to import.

Besides the empirical analysis, we also analyzed some economics and trade indicators to deepen analysis for all selected countries between the years of 1980-2017. One of the prominent results from the economic indicators is changes in per capita income. China experiences increase in GDP per capita approximately 44 times higher of level at 1980 which is the highest rise by far between selected countries. Thailand comes second by increase of around 9 times. Poland and Turkey take third and fourth rankings by increase around 7 and 6 times, respectively. Second indicator is about average growth rate. Once again China keeps the highest average growth rate over the years by 9.6%. Mexico takes second place with the average of 5.9% and Thailand takes third by 5.2%. Turkey and Dominican Republic come after with the average rate of 4.6%. Greece, Argentina and

Romania have the lowest average growth rate. Third indicator show the number of years countries experience negative growth rate. This indicator is important in terms of giving a clue whether countries' growth experiences are fluctuating or more stable. Argentina has experienced 15 years of negative growth while Greece has 13 years of negative growth rate experience. Brazil, Malaysia, Peru and Romania have 7 years of negative growth experience between the years of 1980-2017. In this period, China has no negative growth rate experience while Turkey has 5 years of negative growth rate. Poland and Colombia have 1 year of experiencing negative growth rate.

Trade indicators also showed interesting results. On the ratio of total trade corresponding to GDP in 2017; Malaysia, Thailand and Poland have highest ratio of trade to GDP. Brazil, Argentina and Colombia have the lowest trade/growth ratio. Turkey and China are the countries showing the biggest change when it comes to 2017 by increasing more than 3 times according to the level of 1980. On the high-tech exports ratio of manufactured exports side, Malaysia, China and Thailand have the highest share of high technology exports in total manufactured exports Turkey, Peru and Ecuador have the lowest share. The countries with the highest increase in proportion are Colombia, Poland and Romania between 2007 and 2017. Another important indicator is the import content of exports. Malaysia and Mexico have the highest ratio of import content in their exports in 2016. Thailand, Poland, Romania, Greece, China and Turkey come after, respectively. China and Turkey both have 16% share of import content in their exports while Argentina, Peru and Brazil have the lowest shares. Also, China has the highest proportional declining between the years of 2005 and 2016.

The most important inference we derive from this analysis is that China has benefited more from the relationship between foreign trade and economic growth among other developing countries after trade liberalization. China's economy has a more stable and high growth trend. In addition, its domestic market has strengthened and gained international competitiveness. In addition, it was observed that countries with causality from import to economic growth could not achieve economic stability and experienced negative growth for more than one year with lower average growth rate than China. Trade and growth causal relationships and macroeconomic indicators are heterogeneous for different countries, supporting thesis hypothesis that Beijing Consensus trade liberalization leads to different outcomes from Washington Consensus type of liberalization.

Chapter Five: The Relationship Between the Import Components and Growth: A Case of Turkey

In previous chapters, causality directions from the imports to growth was valid for Turkey and other developing countries (except China) that also have causality from exports to growth. To explore whether imports played a role in GDP, this chapter examined the role of imports components in GDP growth in Turkey.

5.1. Overview

The general understanding of macroeconomics is that imports are seen as an income leak that may lead to unemployment rather than economic growth as mentioned above. Hence, the causality and direction of the relationship in the foreign trade and growth literature have been examined mostly in terms of export-growth side. But some studies have shown that, without import control, any causality between exports and growth can be counterfeit and hence misleading (Thangavelu and Gulasekaran, 2004; Riezman et al., 1996; Esfahani, 1991).

It is possible import increase the efficiency in domestic production and enable the development of the country's industrial structure. In general, developed countries keep the capital and technology advantages. On the other hand, developing countries have lack of technology and capital yet having labor and natural resources advantages. For this reason, exports are mainly low value-added production such as agricultural products and importing is the fastest way to reach high technology products or inputs. In this consideration, import seems a key tool to solve the issues and improve domestic market and thus economic development (Chen, 2009).

In previous parts, we observed that Turkey and most of other developing countries have causal relationship from imports to growth. In this part, we will run an econometric test to define the specific relationship between import components classification by Broad Economics Categories (BEC) and GDP for Turkey. This may create an opportunity to interpret causality between import and growth for developing countries.

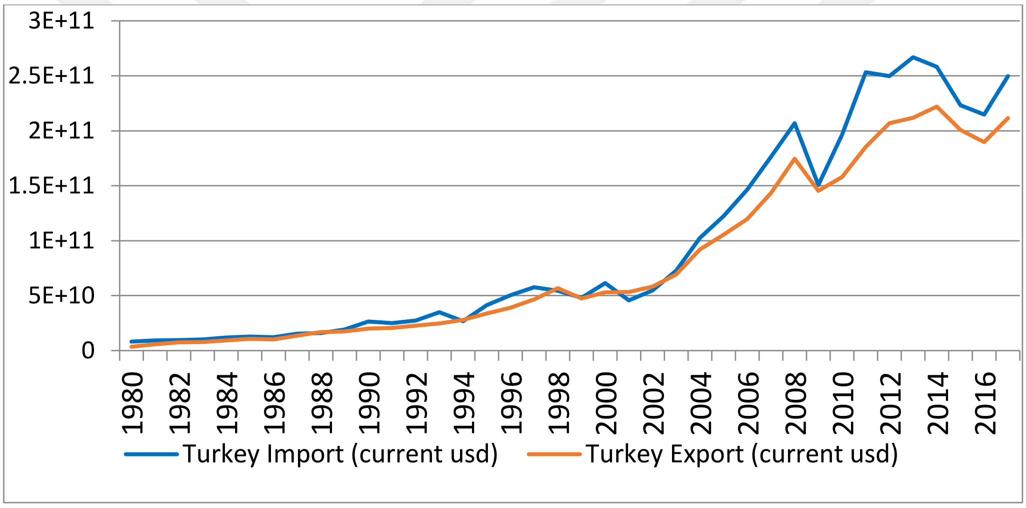


Figure 46. Turkey Imports and Exports of Goods and Services

Source: World Bank, 2019d

As seen the from Figure 56 imports of goods and services for Turkey follow above similar trends to exports over the years after trade liberalization. The gap between import and export becomes larger right after 2001 banking crisis of Turkey that are the years of higher growth experiences for Turkey. The peak point of imports is in the years 2013 after year of GDP per capita for Turkey is in the highest level.

Figure 57 shows the changes in import components of Turkey. It is seen that imported intermediate goods keep major part of imports of goods and services. It is more than the sum of imported consumption goods and imported capital goods.

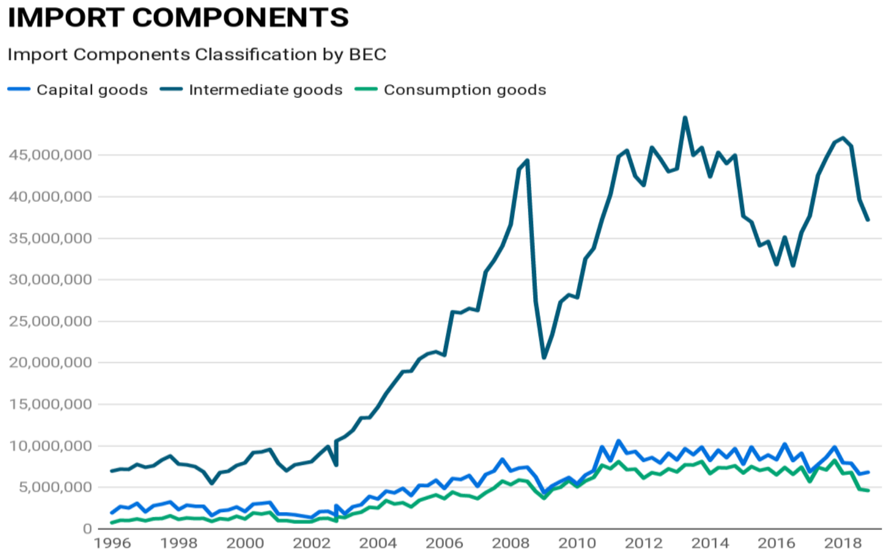


Figure 47. Changes in Import Components of Turkey by Years

Source: Turkish Statistical Institute,2019

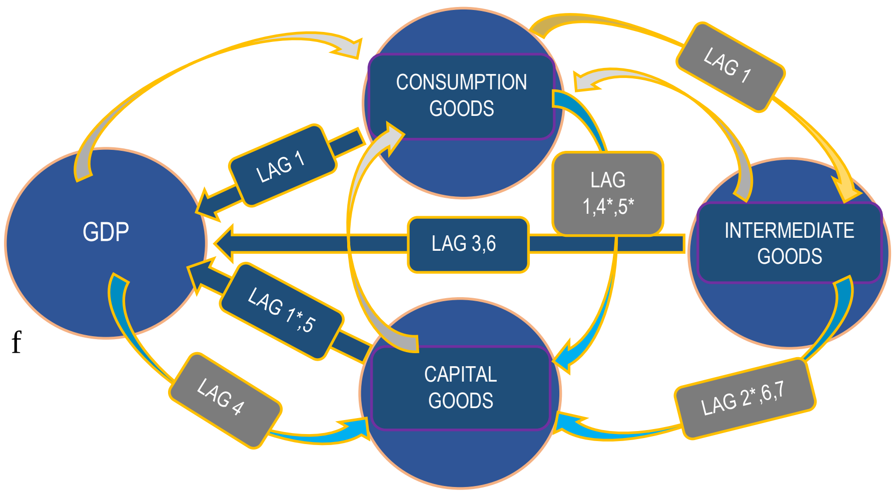
5.1.1. Summary of Empirical Results

In previous parts, we observed that Turkey and most of other developing countries have causal relationship from imports to growth. In this part, we run an econometric test to define the specific relationship between import components classification by Broad Economic Categories (BEC) and GDP for Turkey. This analysis brought an opportunity to interpret causal relationship between import and growth. We used Vector Error Correction Model to analyze. Variables were imports components (Intermediate Goods, Consumption Goods, Capital Goods) and GDP. Data was fetched from Turkish Statistical Institute and covers the quarterly data of 1998Q1 to 2018Q3. Results revealed that imported intermediate goods have strong causal impact on GDP. Also, imported consumption goods and capital goods has significant causal effect on GDP. Imported intermediate goods have impact on imported consumption and imported capital goods.

Findings from this chapter and previous chapters brought the assumption that imports cannot help enough to improve domestic productivity and technological improvements for Turkey and possibly other developing countries followed Washington Consensus type of trade liberalization. It is indicating the dependence on foreign technology and lacking of industrial catching up along the economic growth. Imports may simply be consumed, as it does not generate much positive impacts on exports either, only contribute to more imports.

Summary of the empirical results of GDP and import components for Turkey is shown in the below.

<table>
<tr><th colspan="4">GDP AND IMPORT COMPONENTS</th></tr>
<tr><td>Variables:
Log(GDP),
Log(INT),
Log(CAP)
Log (CON)</td><td>Sample:
1998Q1-2018Q3
(Quarterly, Current USD)</td><td>Stationarity:
All variables are stationary at first difference</td><td>Lag:
Optimal lag selected as lag 8 based on AIC, SC, HQ and model diagnostics compatibility.</td></tr>
<tr><td>VEC Test

*10%
significance level</td><td colspan="3">
</td></tr>
<tr><td>Granger Causality

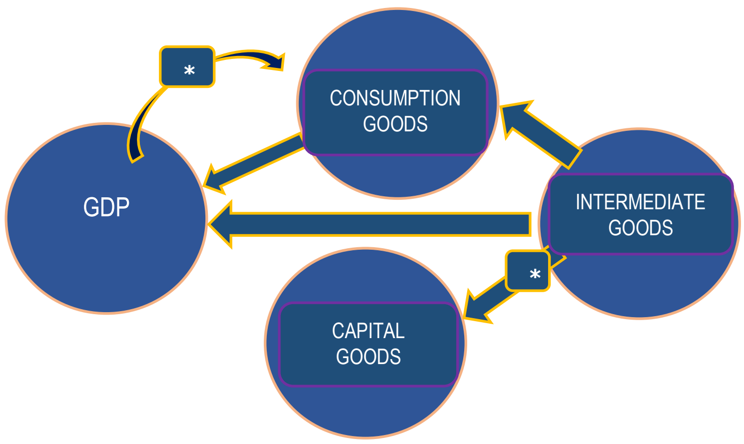
*10%
significance level</td><td colspan="3">
</td></tr>
</table>

Figure 48. Summary View of Econometric Results for GDP and Import Components

5.1.1.1. Impulse Response Functions (IRF)

Response of GDP to shocks: Imported intermediate goods shocks make a positive impact on GDP at first period. Then, it becomes negative and fluctuates over the time. Imported consumption goods shocks cause a negative response at first period. After that, response of GDP increases and becomes positive by 4th period with a rising trend. GDP responses to the capital goods are negative over the time.

Response of Intermediate Goods to Shocks: Imported intermediate goods respond to imported capital goods positively over the time with a fluctuated trend right after a rise trend until 4th period. Yet, GDP shocks cause negative response on imported intermediate goods. Imported consumption goods shocks have a positive effect on intermediate goods until 6th period. Then it goes to negative effect for 2 periods. By 9th period becomes positive again.

Response of Capital Goods to Shocks: Imported intermediate goods create a positive response on the imported capital goods. It has an increasing trend at first 3 periods then it fluctuates over the time periods. Response of imported capital goods is positive by an increasing trend until 2nd period. Then, it goes down sharply and becomes negative by 6th period. GDP shocks cause negative responses over the time periods on the imported capital goods

Response of Consumption Goods to Shocks: The response of imported consumption goods is significantly positive over the time. Moreover, imported capital goods have also significant positive impacts on the imported consumption goods following the imported intermediate goods. GDP shocks have negative effect on imported consumption goods.

5.1.1.2. Variance Decomposition

Variance Decomposition of GDP: in GDP predicted variance, GDP contribution to itself change starts to gradually decrease from the first period to 74% level in the 10th period. Imported intermediate goods contribute to GDP until 7% over the time period while imported capital goods contribution to GDP is around 3%. On the other hand, imported consumption goods contribute to GDP up to 16% percent with 10th time period.

Variance Decomposition of Intermediate Goods: In intermediate goods predicted variance, GDP contributes 26% in the first period while it decreases to 16% over the time period. Major contribution of imported intermediate goods comes from itself fluctuated around 73% through the time periods. Contribution from the imported capital goods goes up to 8% during the time periods while imported consumption goods contribute around 2% to imported intermediate goods over the time periods.

Variance Decomposition of Capital Goods: In capital goods predicted variance, major contribution comes from itself while 63% in the beginning to 40% in the 10th period by decreasing. On the other side, imported intermediate goods contribute to imported capital goods starting from 19% to 41% in the time periods. Contribution GDP comes to 14% while it is 17% in the beginning. Imported consumption goods contribute to imported capital goods go down to %5 while it peaks to 10% from zero in the second period

Variance Decomposition of Consumption Goods: In consumption goods predicted variance, imported intermediate goods put the major contribution in the 10th period by around 50% come from 24% in the beginning. GDP contributes 22% in the first period and decreases to 16%. Contribution from imported capital goods starts with 23% and fluctuates over time to 20% in the 10th period. Imported consumption goods contributes to itself 13% in the 10th period while it is 28% in the beginning.

5.2. Empirical Analysis

5.2.1. Data

Import components used in this chapter are classified based on Broad Economic Categories (BEC) classifications (imported intermediate goods, imported capital goods and imported consumption goods). Another variable is GDP as measurement of economic growth. Data is quarterly data starts from 1998Q1 to 2018Q3 and imported from Turkish Statistical Institute (TurkStat). All variables are current USD.

5.2.2. Methodology

This chapter investigates relationship between imports components and growth to explore whether imports played a role in GDP. Some economists discuss and investigate the role of imports on economic growth. According to discussion, it is possible imports increase the production efficiency and enable the development of the industrial structure of the country (Esfahani, 1991; Riezman, et al., 1996; Thangavelu and Gulasekaran, 2004, Park, et al., 2007, Chen, 2009, Veeramani, 2009). Vector Error Correction (VEC) model was also applied frequently to investigate this relationship (Mishra, 2012; Bakari and Mabrouki, 2017).

Vector Error Correction Model (VEC)

As a multivariate time series, VEC is a full information maximum likelihood estimation model and provides a more efficient estimator for cointegration vectors that allows a VEC to be tested in a system of all equations in one step without testing the normalization of a given variable. The term cointegration is known as the error correction term as the deviation from equilibrium is gradually corrected in the long run by a series of partial short-term adjustments. VEC has built cointegration relationships to model specification, thus long-term behavior of endogenous variables converges the cointegration relationships and provides short-term adjustment dynamics.

The regression equation form for VEC is as,

$$\Delta y_t = \alpha_1 + p_1 e_1 + \sum_{i=1}^{n} \beta_i \Delta y_t - i \sum_{i=1}^{n} \delta_i \Delta x_t - i + \sum_{i=1}^{n} \gamma_i \Delta z_t - i \qquad \textbf{(21)}$$

$$\boldsymbol{\Delta x_t = \alpha_2 + p_2 e_i - 1 + \sum_{i=1}^{n} \beta_i \Delta y_t - i \sum_{i=1}^{n} \delta_i \Delta x_t - i + \sum_{i=1}^{n} \gamma_i \Delta z_t - i} \qquad (22)$$

where α_1 and α_2 is a constant.

The empirical methodology used in this study requires determining the degree of integration of each variable. Because, time series for economic data is generally stochastic or shows a non-stationary trend, ie the data has a root unit. Various statistical tests are applying for determining the degree of integration of a variable. Augmented Dickey-Fuller (ADF) or/and Philips Perron (PP) unit root tests is used as a part of methods used in this study. Phillips-Perron is a nonparametric alternative method which modifies the augmented Dickey-Fuller test, running the same regression by OLS but calculating different critical points in order to consider the possibility of serial correlation (Hamilton, 1994).

After finding the proper order of integration, next stage is optimum lag selection for VAR model. Schwarz Information Criterion, (SC)Akaike Information Criterion (AIC) or

Hannan Quinn (HQ) are the criteria for determination number of lags (orders). VAR model stability is also tested in here before moving to cointegration test stage.

The testing the cointegration relationship depends on stationarity level. If stationarity is found at the first difference level, then necessarily brings to test possibility of cointegration to see the long-term balance between observed variables. Linear connection can provide stationarity when a data individually is not stationary. Then data becomes cointegrated. Johansen test is used for cointegration. Comparing to Engle and Granger's (1987) two-step strategy, procedure of Johansen (1988) is more effective in case of the small sample and the high number of variables. In Johansen procedure, cointegration relationship is seen from the value of trace statistic and max eigen statistic. After run cointegration test, if results show cointegrating relationships, VEC is chosen. if results show no cointegrating relationship, VAR model is the one to be proceed.

As a restricted form of VAR, VEC model defines cointegration relationships in order to nonstationary series. After determination of cointegration in the model, process continues to error correction method. Any integration difference degrees of variables are run jointly between the long-term by error correction equation, thus cointegration variable occurs. The integration degree of cointegrated variables is known Lee and Granger such multi cointegration (Suharsono, Aziza and Pramesti, 2017). After VEC test, VEC Granger Causality test is run to check causal relationships in short term. Then, Impulse Response Function (IRF) and Variance Decomposition are tested to interpret shocks and response and contribution of variable to each other in parameterized time periods. Finally, tests for Autocorrelation, Normality and Heteroscedasticity are done to check model structure regarding to residuals.

5.2.3. Model Specification and Procedure

In this investigation, VEC model is applied to analysis relationships between import components and growth. Macroeconomic variables mostly are not suitable for policy analysis and forecasting, as they have possibly nonstationary behavior and high persistence. Data must be stationary by using unit root tests that may have an intercept and/or a trend before proceeding to the VEC examination. Augmented Dickey-Fuller (ADF) unit root test is used to stationarity. Then, Granger Causality test and Johansen cointegration test under the broader framework of Vector Error Correction (VEC) model are used to examine the dynamic relationship between GDP and imports components in both short-term and long-term, to find causality and direction between them. Impulse Response Functions (IRF) and Variance Decomposition are estimated to reveal supply and demand shocks of variables to each other over the time. Econometric calculations are made by using EViews 10 software.

Model specification;

$$ln(gdp)_{it} = \alpha_i + \beta_{it}\, ln(int) + \beta_{it}\, ln(con) + \beta_{it}\, ln(cap) + + \varepsilon_t \qquad \textbf{(23)}$$

The abbreviations for the data used are as follows;

lnGDP = *log of GDP*

lnINT = *log of imported intermediate goods*

lnCON = *log of imported consumption goods*

lnCAP = *log of imported capital goods*

The estimation methodology consists of 11 steps;

The empirical methodology used in this study requires determining the degree of integration of each variable. Because, time series for economic data is generally stochastic or shows a non-stationary trend, ie the data has a root unit. Augmented Dickey-Fuller (ADF) or/and Philips Perron (PP) unit root tests were applied for determining the degree of integration of a variable. After finding the proper order of integration, next stage was optimum lag selection for VAR model. Schwarz Information Criterion, (SC)Akaike Information Criterion (AIC) or Hannan Quinn (HQ) are the criteria for determination number of lags (orders). Then, Johansen procedure conducted to determine presence of cointegration vectors in long run. After run cointegration test, results showed cointegrating relationships. Thus, VEC Model was chosen. VEC model defines cointegration relationships in order to nonstationary series for long term, and also short-term estimations. After VEC test, VEC Granger Causality test was run to check causal relationships in short term. Then, Impulse Response Function (IRF) and Variance Decomposition were tested to interpret shocks and response and contribution of variable to each other in parameterized time periods. Finally, tests for Stability, Autocorrelation, Normality and Heteroscedasticity were done to check model structure regarding to residuals.

5.3. Results and Discussion

Macroeconomic variables mostly are not suitable for policy analysis and forecasting, as they have possibly nonstationary behavior and high persistence. Data must be stationary by using unit root tests that may have an intercept and/or a trend before proceeding to the VAR or VEC tests.

5.3.1. Augmented Dickey Fuller Unit Root Tests

LnGDP and other import components (lnIntermediate goods, lnCapital Goods and ln Consumption) variables are not stationary at the beginning levels that indicates not rejection of null-hypothesis. So, first differences of variables are taken to check stationarity at first orders. At this stage, null-hypothesis is rejected as results shown in the Table 83 that indicate all series are stationary by integrated of order one I(1) including none deterministic regressors.

Table 49. Unit Root Test Results (Import Components, GDP)

Variables	ADF test Statistics (First Difference)	5% Critical value	Deterministic Regressors	Results
LGDP	-4.801682	-1.944862	none	stationary
LIntermediate Goods	-7.291776	-1.944862	none	stationary
LConsumption Goods	-4.723203	-1.945081	none	stationary
LCapital Goods	-4.239494	-1.945081	none	stationary

5.3.2. Optimal Lag Selection

Lag order determination or optimal lag selection have crucial importance for autoregressive lag polynomial since correct model specification affects all deduces in VAR/VEC model directly. Choosing a higher lag length results with the higher errors in the mean square forecast in the model. On the other hand, lower lag length causes to autocorrelated errrors (Lütkepohl, 1993). Also, there is an inconsistency both of impulse response functions and variance decomposition when the lag length differs from the correct lag length (Braun and Mittnik, 1993).

Table 50. Optimal Lag Selection (Import Components, GDP)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	0.486291	NA	1.29e-05	0.093699	0.217298	0.143051
1	299.4759	558.1139	6.82e-09	-7.452691	-6.834694*	-7.205931
2	323.6265	42.50501	5.51e-09	-7.670039	-6.557645	-7.225873*
3	336.6188	21.48064	6.03e-09	-7.589835	-5.983043	-6.948260
4	358.7913	34.29343	5.20e-09	-7.754434	-5.653245	-6.915452
5	382.0189	33.44773	4.42e-09	-7.947170	-5.351583	-6.910781
6	413.4784	41.94606*	3.06e-09	-8.359424	-5.269440	-7.125628
7	432.6474	23.51395	3.00e-09	-8.443931	-4.859549	-7.012726
8	**452.0641**	**21.74674**	**2.99e-09***	**-8.535043***	**-4.456264**	**-6.906432**

Even though there is no hard rules about appointing the optimal lag length, Akaike (AIC), Hannan-Quinn (HQ) and Schwarz (SC) are the information criterias are used for determining optimal lag selection. In table 84, Optimal lag lengths are selected based on AIC, SC, HQ and model diagnostics compatibility. These are 8 lag length for GDP and imported intermediate, capital and consumptions goods.

5.3.3. Johansen Cointegration Test

As a maximum likelihood method Johansen procedure indicates the presence of cointegration vectors and, if any, designates the number cointegration in non-stationary time series VAR model with restricted which is VEC.

Table 51. Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.345695	60.97789	47.85613	0.0018
At most 1	0.227954	29.58841	29.79707	0.0528
At most 2	0.126635	10.44378	15.49471	0.2481
At most 3	0.005714	0.424031	3.841466	0.5149
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None*	0.345695	31.38948	27.58434	0.0154
At most 1	0.227954	19.14463	21.13162	0.0927
At most 2	0.126635	10.01975	14.26460	0.2106
At most 3	0.005714	0.424031	3.841466	0.5149
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				

* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

Under Johansen procedure (Johansen, 1991) two different test statistics are used for defining cointegration: Trace Test and Maximum Eigenvalue Test. The trace test as a joint test tests the null hypothesis (H0: r=0) against alternative cointegration hypothesis (H0: r > 0). The Maximum Eigenvalue test performs individual tests on each and every eigenvalue to test the null hypothesis (number of cointegrated vectors is equal to r) versus the alternative hypothesis (r + 1 cointegrated vectors). Existence of long run cointegration relationships leads to conduct VEC model.

As seen above, this test is to control whether the variables are cointegrated that shows the long-term relationship between them. The Johansen cointegration test, whose log values are defined according to the criteria used in the VAR model, is run using the logged values of the variables. GDP and import components have 1 cointegrating equation indicates in both trace test and maximum eigenvalue tests at the 0.05 level.

5.3.4. Vector Error Correction Test (VEC)

VEC Model uses Error Correction Term (ECT) to correct the short terms dynamics errors and restore equilibrium for long run cointegration. It can be simply formulated as follows;

$$\text{Cointegration equation: } Z_{t-1} = ECT_{t-1} = Y_{t-1} - B_0 - B_1X_{t-1} \tag{24}$$

If adjusted to in the model;

$$\begin{gathered}\text{Cointegration Equation (Long-run model)} = Ect_{t-1} \\ =1.000*(GDP(-1) + 183.176747503*INT(-1) + \\ 41.4485918043*CAP(-1) - 211.755928233*CON(-1) - \\ 565.038634164\ )\end{gathered} \tag{25}$$

Herein, *INT= Imported Intermediate goods*, *CAP= Imported Capital goods, CON= Imported Consumption goods*

Then, estimated VEC with GDP as target variable:

$$\begin{gathered}D(GDP) = C(1)*(GDP(-1) + 183.176747503*INT(-1) + \\ 41.4485918043*CAP(-1) - 211.755928233*CON(-1) - 565.038634164\ )+ \\ C(11)*D(INT(-3)) + C(14)*D(INT(-6)) + C(16)*D(CAP(-1)) + + C(20) \\ *D(CAP(-5)) + C(23)*D(CON(-1))\end{gathered} \tag{26}$$

Table 52. Vector Error Correction Test

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.001646	0.000581	-2.833807	0.0051
C(11)	0.404985	0.146230	2.769509	0.0062
C(14)	0.316243	0.133840	2.362839	0.0192
C(16)	0.288852	0.155954	1.852161	0.0656
C(20)	-0.378091	0.151726	-2.491928	0.0136
C(23)	-0.577966	0.163508	-3.534787	0.0005
C(53)	0.498593	0.244336	2.040604	0.0428
C(65)	0.423335	0.214862	1.970264	0.0503
C(71)	-0.380518	0.224405	-1.695681	0.0917
C(74)	-0.477844	0.205392	-2.326496	0.0211
C(75)	-0.449776	0.229905	-1.956357	0.0520
C(76)	-0.619498	0.239328	-2.588495	0.0104
C(83)	1.279306	0.250920	5.098465	0.0000
C(86)	0.493381	0.264368	1.866264	0.0636
C(87)	-0.416624	0.249568	-1.669382	0.0968
C(91)	0.002775	0.000881	3.151062	0.0019
C(93)	0.481683	0.257889	1.867792	0.0634
C(94)	-0.548561	0.220685	-2.485712	0.0138
C(95)	0.367428	0.212261	1.731022	0.0852
C(99)	-0.433557	0.216627	-2.001395	0.0469
C(101)	-0.382714	0.221687	-1.726369	0.0860
C(102)	-0.464492	0.234250	-1.982894	0.0489
C(104)	-0.385413	0.202905	-1.899474	0.0591
C(105)	-0.870328	0.227121	-3.831997	0.0002
C(113)	1.027639	0.247882	4.145685	0.0001
C(116)	0.573623	0.261167	2.196386	0.0293
C(119)	0.582278	0.235697	2.470454	0.0144
	D(GDP)	**D(INT)**	**D(CAP)**	**D(CON)**
R-squared	0.535278	0.442302	0.821895	0.792325
Log likelihood	113.9674	83.84125	81.84702	82.76069
Akaike AIC	-2.239130	-1.435767	-1.382587	-1.406952
Schwarz SC	-1.312135	-0.508771	-0.455592	-0.479956

As the seen in the equation, long term and short-term dynamics have coefficients of variables nominated with C from the VEC table. Also, p-values (prob) show whether coefficients statistically significant or not. Regarding of the this C(1) has negative coefficient and p-values below the 0.5% which indicates in long run cointegration of GDP, Intermediate, Capital and Consumption goods are statistically significant as GDP dependent variable. So, in long term imported intermediate and capital goods have positive and consumption goods have negative Granger causal impacts on the GDP by their value of coefficients. On the other hand, there are no statistically significance in the long run equilibrium that Intermediate goods or Capital goods are dependent variables shown in Equations 2 and Equation 3 from the VEC estimations table. But Consumption goods also has long term cointegration as a target variable.

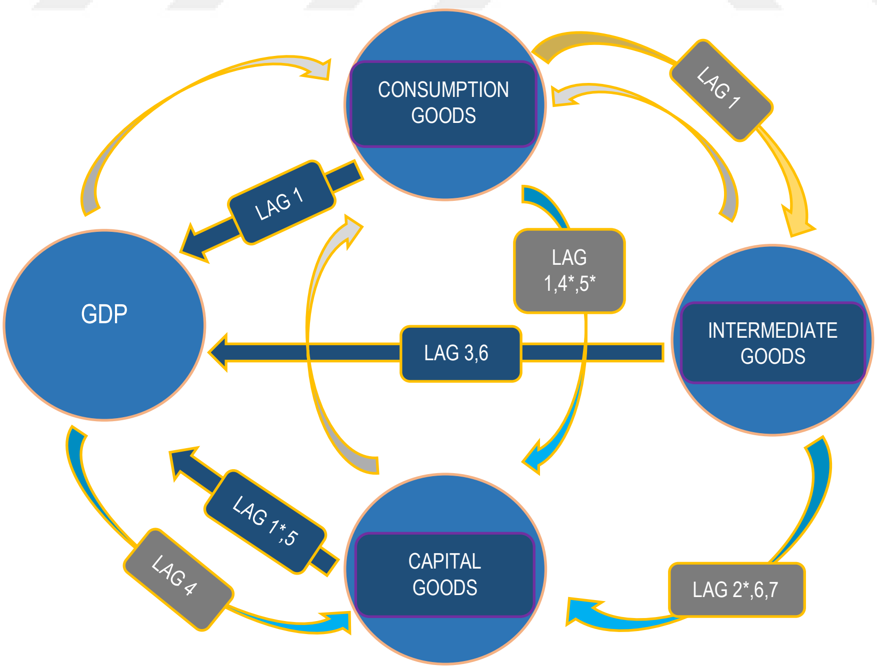


Figure 49. VEC Test Short- Run Causal Relationships by Lags

In short term, imported intermediate goods (lag 3 and 6), capital goods (lag 5) and consumption goods (lag 1) have significant causal effect on GDP by p-values in 0.05% significance level. Capital goods also have another weak causality (10%) by lag 1. In terms of coefficients of the significant lags of the variables, it is seen that from table intermediate goods have strong positive impact on GDP for both lag 3 and lag 6. Also, consumption goods (lag 1), intermediate goods (lag 6 and 7) and GDP (lag 4) have causal directions to imported capital goods while consumption goods (lag 1) are caused to intermediate goods. All variables have causal directions in different lags to imported consumption goods.

5.3.5. VEC Granger Causality Test

Table 53. VEC Granger Causality Tests/Block Exogeneity Wald Tests (Import Component, GDP)

Null Hypothesis, H0	chi2	Prob > chi2	H0
lnGDP does not granger cause on lnCon	12.26651	0.0921	Reject*
lnGDP does not granger cause on lnCap	7.413409	0.3871	Accept
lnGDP does not granger cause on lnInt	4.584855	0.7105	Accept
lnInt does not granger cause on lnGDP	16.00885	0.0250	Reject**
lnInt does not granger cause on lnCap	13.15212	0.0685	Reject*
lnInt does not granger cause on lnCon	21.26595	0.0034	Reject**
lnCap does not granger cause on lnGDP	11.14077	0.1326	Accept
lnCap does not granger cause on lnInt	5.072638	0.6511	Accept
lnCap does not granger cause on lnCon	11.31758	0.1254	Accept
lnCon does not granger cause on lnGDP	14.71709	0.0398	Reject**
lnCon does not granger cause on lnInt	8.999215	0.2527	Accept
lnCon does not granger cause on lnCap	37.54496	0.0000	Reject**

** 5% significan level * 10% significance level

VEC Granger Causality tests indicates the short-term causality between variables. As seen from the Table 87, in short term at %5 significance level imported intermediate goods and consumption goods have causal directions to the GDP. Besides this, imported intermediate goods are caused to imported consumption goods at 5%. Moreover, imported intermediate goods holds causal direction to imported capital goods at 10% significance level. Imported consumption goods have also causality to the imported capital goods at 5% significance level. Last short-term causality is from the GDP to the imported consumption goods.

5.3.6. Impulse Response Function (IRF)

Impulse Response function (IRF) defines the reactions of the system as a function of time and other independent variables. IRF explains the system dynamic behaviors by parameterizing it

As seen from the figure, imported intermediate goods shocks make a positive impact on GDP at first period. Then, it becomes negative and fluctuates over the time. On the other hand, imported consumption goods shocks cause a negative response at first period. After that, response of GDP increases and becomes positive by 4^{th} period with a rising trend. GDP responses to the capital goods are negative over the time.

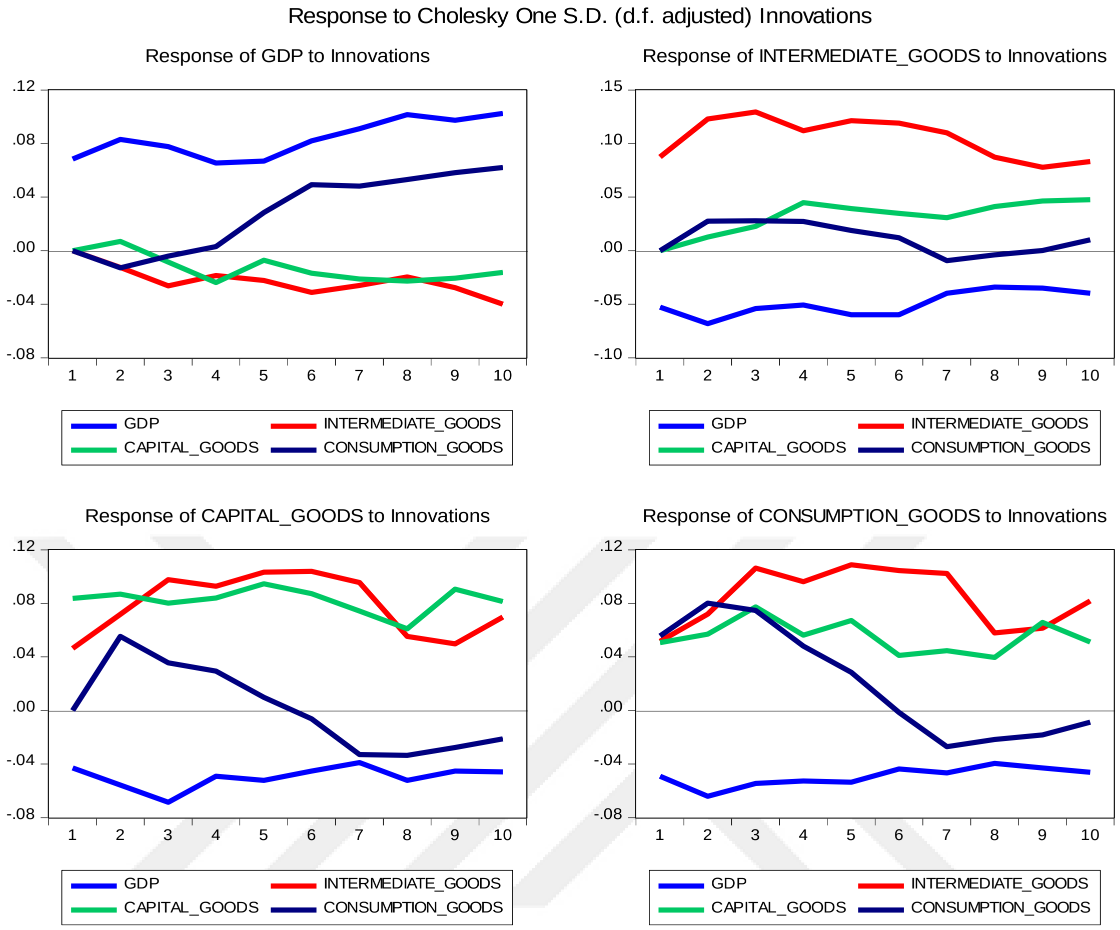


Figure 50. Impulse Response Functions (Import Component, GDP)

Imported intermediate goods respond to imported capital goods positively over the time with a fluctuated trend right after a rise trend until 4th period. Yet, GDP shocks cause negative response on imported intermediate goods. Imported consumption goods shocks have a positive effect on intermediate goods until 6th period. Then it goes to negative effect for 2 periods. By 9th period becomes positive again.

Imported intermediate goods create a positive response on the imported capital goods. It has an increasing trend at first 3 periods then it fluctuates over the time periods. Response of imported capital goods is positive by a increasing trend until 2nd period. Then, it goes down sharply and becomes negative by 6th period. GDP shocks cause negative responses over the time periods on the imported capital goods. The response of imported consumption goods is significantly positive over the time. Moreover, imported capital goods have also significant positive impacts on the imported consumption goods following the imported intermediate goods. GDP shocks have negative effect on imported consumption goods.

5.3.7. Variance Decomposition

Variance Decomposition as a mean square errors decomposition refers the percental amount of information about contribution of variables to each other as short and long terms effects in the autoregression at chosen time horizons.

According the Figure 59, in GDP predicted variance, GDP contribution to itself change starts to gradually decrease from the first period to 74% level in the 10^{th} period. Imported intermediate goods contribute to GDP until 7% over the time period while imported capital goods contribution to GDP is around 3%. On the other hand, imported consumption goods contribute to GDP up to 16% percent with 10^{th} time period.

In intermediate goods predicted variance, GDP contributes 26% in the first period while it decreases to 16% over the time period. Major contribution of imported intermediate goods comes from itself fluctuated around 73% through the time periods. Contribution from the imported capital goods goes up to 8% during the time periods while imported consumption goods contribute around 2% to imported intermediate goods over the time periods.

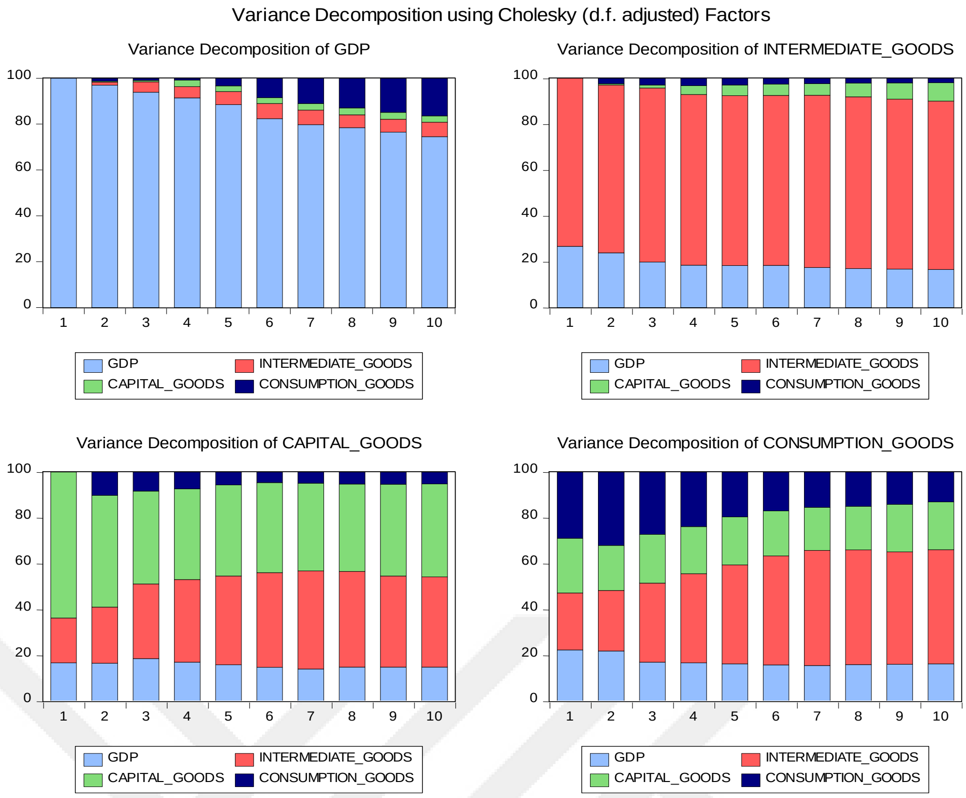


Figure 51. Variance Decomposition (Import Component, GDP)

In capital goods predicted variance, major contribution comes from itself while 63% in the beginning to 40% in the 10^{th} period by decreasing. On the other side, imported intermediate goods contribute to imported capital goods starting from 19% to 41% in the time periods. Contribution GDP comes to 14% while it is 17% in the beginning. Imported consumption goods contribute to imported capital goods go down to %5 while it peaks to 10% from zero in the second period.

In consumption goods predicted variance, imported intermediate goods put the major contribution in the 10^{th} period by around 50% come from 24% in the beginning. GDP contributes 22% in the first period and decreases to 16%. Contribution from imported capital goods starts with 23% and fluctuates over time to 20% in the 10^{th} period. Imported consumption goods contributes to itself 13% in the 10^{th} period while it is 28% in the beginning.

5.4. Model Diagnostics

Model diagnostics are tested to specify the model correctly and prevent spurious results. Model misspecifications occur caused by unstable parameters and conclude to bias estimates. AR Root stability test is shown in Figure 64. Also, Autocorrelation, Normality test and Heteroskedascity are tested due to model diagnostics. Results are shown in Table 78.

5.4.1. Stability Test

To ensure the residual stability of VEC model, AR Roots stability test is checked. If all polynomial roots values are below one, in other words, if all roots are within the circle, VEC model is accepted to be stable. Following graphs shows that all roots are within the circle. It means that the VEC model is stable for GDP and import components.

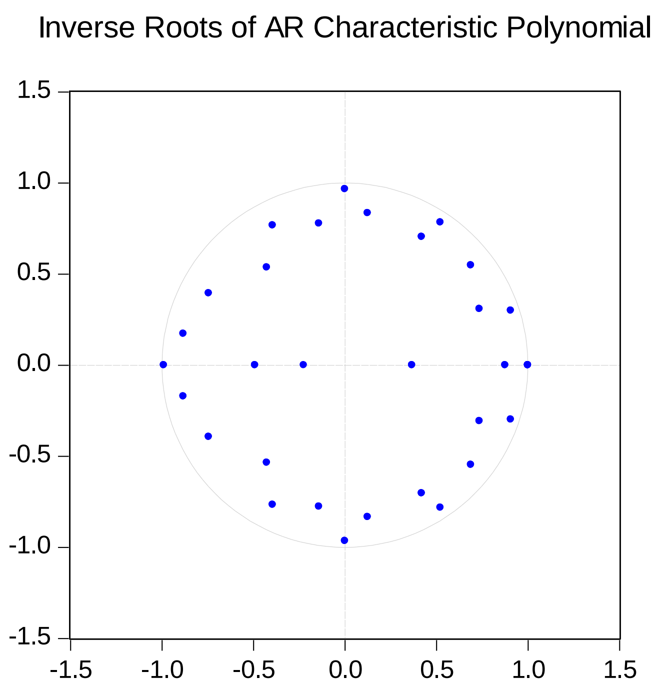


Figure 52. Inverse Roots of AR Characteristic Polynomial

Table 54. Model Diagnostics

Model Diagnostics	
Autocorrelation Test	VEC Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2, lag 3, lag 4, lag 5, lag 6, lag 7 and lag 8 have p-values of 0.8983, 0.0542, 0.5666, 0.8003, 0.3965, 0.2387, 0.8921 and 0.9419, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%.
Heteroscedasticity Test	VEC Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 577.3720 and a p-value of 0.5230 which it makes sure of VEC models reliability.
Normality Test	VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque-Bera joint test result shows that p-value is 0.1214 and higher than 0.05% significance level which indicates sample data is normally distributed.

Summary and Discussion

In previous parts, we observed that Turkey and most of other developing countries have causal relationship from imports to growth. In this part, we run an econometric test to define the specific relationship between import components classification by Broad Economic Categories (BEC) and GDP for Turkey. This analysis brought an opportunity to interpret causal relationship between import and growth. We used Vector Error Correction Model to analyze. Variables were imports components (Intermediate Goods, Consumption Goods, Capital Goods) and GDP. Data was fetched from Turkish Statistical Institute and covers the quarterly data of 1998Q1 to 2018Q3. Results revealed that imported intermediate goods have strong causal impact on GDP. Also, imported consumption goods and capital goods has significant causal effect on GDP. Imported intermediate goods have impact on imported consumption and imported capital goods.

Findings from this chapter and previous chapters brought the assumption that imports cannot help enough to improve domestic productivity and technological improvements for Turkey and possibly other developing countries followed Washington Consensus type of trade liberalization. It is indicating the dependence on foreign technology and lacking of industrial catching up along the economic growth. Imports may simply be consumed, as it does not generate much positive impacts on exports either, only contribute to more imports. On the other hand, results supported previous inference that China's imports might have promoted productivity indirectly via exports.

Chapter Six: The Role of FDI in Domestic Value Added of Exports for Developing Countries

In previous chapters, findings showed that China has benefited more from the relationship between foreign trade and economic growth among other developing countries after trade liberalization. China's economy has a more stable and high growth trend. In addition, its domestic market has strengthened and gained international competitiveness. Previous findings led to us to examine domestic market enhancing as suspicion of FDI has impact on domestic market catching up international market competitiveness. Also, based on findings, China may gain from FDI more than other countries. This chapter examine whether foreign direct investment have critical role in domestic production for selected developing countries.

6.1. Overview

Foreign direct investment (FDI) is an accepted argument in the literature that it increases economic growth in every country that has opened its doors to international trade Borensztein, et al, 1998; Tiwari and Mutascu, 2011; Barua, 2013; Harach and Rodriguez, 2014; Ahmad and Yang, 2018). This is true regardless of the size of its economy or whether it is developed or developing.

International trade liberalization has two important dimensions. One is the freedom of goods and services as imports and exports, and other is movement of capital flow between countries freely. By the trade liberalization policy implementation, exports stimulate economic growth primarily in terms of demand. Advantages of global competition create productivity gains for domestic market. The method of liberalization has key role on growth development conditions since components and priority of every country in the world is to adopt domestic economy due to provide gains from liberalization.

The Washington Consensus-type reforms aim to allow the free play of market forces to coordinate decentralized decisions of companies and individuals through price signals, thus resource allocation efficiency and encouraging creative entrepreneurships. Washington Consensus emphasizes that economic development is very important and should be taken from the hands of government planners and bureaucrats, in contrast to the old foreign trade paradigm of import substitution. Therefore, development policy must focus on liberating and enabling markets. The pro-market agenda was embodied in policies aimed at eliminating the entrepreneurial function of the state. It advocates removing barriers to a competitive exchange rate and FDI to stimulate export growth by eliminating import quotas and low and uniform import tariffs. foreign and domestic companies should be allowed to compete on equal terms. This causes a marked shift towards an outward-looking growth strategy, which makes the economy grow faster (Birdsall, et al., 2010).

After trade liberalization, the Chinese government introduced the official policy (open door policy for FDI) as an important measure to attract and control foreign investors. China's FDI policy includes two measures: the first is the country's transition to a market-oriented economy that deals with the creation of an overall environment compatible with market transactions, and the second is the domestic economy openness for foreign investors. Unlike a market economy where FDI policy is focused to degree of liberalization, China has to implement government policies to make coordination for wide range of economic activities of foreign investing firms. This is because the most important exchange relations and management structures on businesses are dominated by state control (Yuan & Tsai, 2000). The Chinese government-controlled and coordinated FDI policy has resulted in Chinese exports to evolve more than anticipated. There is more to China's export success than comparative advantage and free markets. The policies implemented by the government contributed to the development of local talent sectors. This allowed China to achieve a much more sophisticated export basket than expected and therefore rapid growth (Rodrik, 2006).

In this chapter, we will investigate relationship between FDI and domestic value-added exports to reveal effect of FDI on domestic market in the selected developing country which liberalized guidance of the Washington Consensus type of reforms and China, with unique approach as called Beijing Consensus. This investigation will enable us to observe the impact of FDI to countries on the domestic market enhancing. It is also important in that it is one of the pioneering studies examining the relationship between FDI and Domestic value-added content of exports.

6.2. Empirical Analysis

6.2.1. Data

Variables are inflow FDI (Foreign Direct Investment) and Domestic Value-Added Content of Exports. Data is annual and fetched from OECD and WORLDBANK databases in the years of 2005-2015.

6.2.2. Methodology

This study analyzes whether foreign direct investment has an impact on domestic value-added content of exports for 14 developing countries which are Argentina, Brazil, China, Colombia, Greece, Malaysia, Mexico, Peru, Poland, Romania, Thailand and Turkey between the years of 2005-2015. Panel Analysis Random and Fixed Effects Models are applied for this investigation.

Panel Data Analysis: The Fixed and Random Effects

Panel analysis is a statistical method typically applied in econometrics to examine longitudinal and cross-sectional panel data. In panel data, individuals (individuals, companies, countries, etc.) are observed at multi points in time. Panel data is highly useful when target variable has dependency on explanatory variables associated with estimated explanatory variables. When omitted variables are constant during the period, then estimators of panel data offer a consistent estimate of the observed explanatory variables effect (Cameron, et al., 2005).

in the multiple linear regression model consideration

for individual $i= 1,...,N$; as a multi-time periods observation $t= 1,...,T$

$$y_{it}=\alpha+x'_{it}\beta+c_i+u_{it} \tag{27}$$

Here;

y_{it} : dependent variable, x'_{it} : K-dimensional row vector for explanatory variables without constant, α: intercept, β : vector of parameters in K dimensional column, c_i : individual-specific effect and u_{it} : idiosyncratic error term.

The Random Effects Model

In the random effects model, as a random variable the individual-specific effect doesn't have correlation with the explanatory variables (Gardener, et al., 2009).

$$E(c_{ij}X_i) = 0 \tag{28}$$

i) Assumes the individual-specific effect, as random variable isn't associated with any explanatory variables of the same individual's all time periods (past, present, future).

ii) Assumes individual specific effect has constant variance.

iii) Assumes all regressors with a non-perfectly collinear constant, also all regressors include non-zero variance without high number outliers (except the constant).

The random effects model can be shown as following;

$$y_{it} = a + x'_{it} B_{it} + v_{it} \quad \text{where } v_{it} = c_i + u_{it} \tag{29}$$

The Fixed Effects Model

In the fixed effects model, unlike the Random Effect model, as a random variable the individual-specific effect can be accepted to be correlated with the explanatory variables (Woldridge, 2013).

i) assumes individual specific effect has constant variance.

ii) assumes that the all regressors include non-zero within-variance and explanatory variables don't have perfectly collinear (i.e. a given individual's variation over time) without many extreme values. Therefore, x_{it} is not allowed include any other time-invariant variables or a constant.

The fixed effects model;

Subtracting time averages $y_i = 1/T\Sigma t y_{it}$ from the initial model

can be shown as following;

$$y_{it}=\alpha+x'_{it}\beta+c_i+u_{it} \quad \textbf{(30)}$$

yields the within model

$$y_{it} = x_{it} + u_{it} \quad \textbf{(31)}$$

where $y_{it} = y_{it} - y_i$, $x_{it}k = x_{it}k - x_ik$ and $u_{it} = u_{it} - u_i$ and intercept α , the individual-specific effect c_i are canceled.

6.2.3. Model Specification and Procedure

This study analyzes whether foreign direct investment has an impact on domestic value-added content of exports. In the literature, impact of the FDI on economic growth is commonly examined. So, it is modeled through the production function assuming while technology is constant, based on the new growth theory any rise in the capital and/or labor will cause increase output level in the economy (Barro and Sala-i-Martin (1995). Krugman and Obstfeld show how growth between partners of trade reflects to the domestic market via foreign trade channels in terms of factor intensity of exported and imported commodities, price dynamics and variations of the endowments stock. The proposed economic growth in the trade partners gain due to new export opportunities. At the same time, it is possible to characterize positive effects that encourage adjustment and modernization, as well as negative impact from harsh competition in new export markets. Likewise, increasing import and export capacities potentially bring beneficial effects in growth in the country's economy (Krugman and Obstfeld, 1992). Within the scope of the new growth theory, the expansion of exports increases economic efficiency in allocation of inputs and improves productivity that states international trade is beneficial for growth and technological progress (Mankiw, 2004).

FDI plays an important role in the integration and development of developing countries into the global economy as well as contributing to economic growth in host countries. FDI tends to focus on manufacturing sectors and infrastructures and benefits from it by comparing potential and current situations with the capital, technology and market access components it includes. It enables new investments by increasing productivity in sectors where comparative advantage exists. FDI also demonstrates the confidence-building effect of local economies, both nationally and internationally for further investments (Chen, 1992; Ögütçü, 2002; Tiwari and Mutascu, 2011).

Domestic Value-Added Content of gross exports is new type indicators created by OECD-WTO joint. As defined in OECD library "*Domestic value added in gross exports is an estimation of value added, by an economy, in producing goods and services for export, simply defined as the difference between gross output at basic prices and intermediate consumption at purchasers' prices. The measure is a percentage share of value. Value added can be decomposed into the following components: compensation of employees; gross operating surplus; mixed income; and other taxes on production less subsidies on production. It can also be derived as the difference between GDP (at market prices) and taxes on products less subsidies on products*" (OECD, 2021). It defines production fragmentation from domestic market productivity as "self-sufficiency" thus, it means less imported intermediate inputs or foreign value in the exports.

Therefore, This analysis will investigate whether foreign direct investment has an impact on domestic value-added content of exports. Since this is one of the first research to focus on FDI impact on the domestic value-added content of gross exports.

Hypothesis;

H_{1A}: Foreign Direct Investment has significant impact on Domestic Value-Added Exports for developing countries

H_{1B}: Foreign Direct Investment has significant impact on Domestic Value-Added Exports in China more than other developing countries

Panel Analysis Cross Section Models are used for this investigation. Data is annual and fetched from the OECD and the World Bank databases in the years of 2005-2015. Unit root test, Hausman test are applied under the Random and Fixed effects models framework. As developing countries may have country-specific variables (Tiwari and Kalita, 2011) which not included in this investigation. And since there is no guidance literature on domestic value-added content of gross exports, we added some control variables to check model results. Also, China is selected as dummy variable to capture FDI impact on domestic value-added content of gross exports compared to other developing countries.

Therefore, model specification is generalized as below:

$$Ln(DVAEX)it= \alpha i+\beta it\ ln(FDI) +\gamma 2CHN2+ \beta 3Controlit + uit+ \tau t + \varepsilon it \quad \textbf{(32)}$$

DVAEX is Dependent variable, FDI is independent variable. CHN is Dummy, FX, PSC, TR, YOS are control variables. u_{it} *country dummies* τ_t *year dummies*

DVAEX : Domestic Value-Added Content in Gross Exports (Current USD)

FDI : *Inward Foreign Direct Investment (Current USD)*

FX : *Real effective exchange rate index (2010 = 100)*

PSC : *Monetary Sector credit to private sector (% GDP)*

TR : *Tariff rate, applied, simple mean, all products (%)*

YOS : *Average Total Years of Schooling for Adult Population (UNDP,2018)*

CHN : *Dummy Variable for China.*

Exchange rate (Asseery & Peel, 1991) represent price of inputs and outputs in the international market, monetary sector credit to private sector (Doojav & Batmunkh, 2018) for representing credibility of private sector in production, tariff rate (Tokarick, 2006) for representing free exit and entry and average total years of schooling for adult populations (Lee, 2017) for representing of human capital are selected due to their relations and impacts to domestic market productivity and thus domestic value-added content of gross exports.

Table 79 shows variables descriptive statistics includes mean, maximum and minimum, standart deviation and observations.

Table 55. Descriptive Statistics

	lnDVAEX	**lnFDI**	**FX**	**PSC**	**TR**	**YOS**
Mean	6.1742	23.236	211.19	58.481	6.6677	8.7022
Maximum	11.117	26.396	2741.8	152.59	14.810	12.300
Minimum	2.8069	18.557	1.3000	10.416	2.2100	6.0000
Std. Dev.	1.8030	1.3181	583.97	38.518	3.8980	1.6315
Observations	132	132	132	132	132	132

6.3. Results and Discussion

6.3.1. Unit Root Test

Before testing any regression, first we check the stationarity of all variables due to avoid spurious results in the model. Unit Root Test results are shown in the table 80 for checking staionarity of the variables which are Domestic Value-Added content in Exports; Foreign Direct Investment Real effective exchange rate index, Monetary Sector credit to private sector, Tariff rate and Average Total Years of Schooling for Adult Population.

Results show absence of unit root that indicates stationarity of all variables. So, We reject null hypothesis.

Table 56. Unit Root Tests

	Common Unit Root	Individual Unit Root	
	Levin, Lin & Chu t*	Im, Pesaran and Shin	ADF Fisher
ln(DVAEX)	-3.82219 (0.0001)***	-1.99245 (0.0232)**	79.6812 (0.0000)***
ln(FDI)	-4.92728 (0.0000)***	-2.22042 (0.0132)**	40.5714 (0.0186)**
FX	-3.61714 (0.0001)***	-4.42624 (0.0000)***	37.2216 (0.0224)**
PSC	-4.53014 (0.0000)***	-2.14278 (0.0161)**	42.3393 (0.0118)**
TR	-2.20218 (0.0138)**	-4.02760 (0.0000)***	63.4122 (0.0000)***
YOS	-5.42336 (0.0000)***	-3.38424 (0.0004)**	60.3078 (0.0001)***

H_0: has unit root; *H_1: stationary, absence of unit root.*

****, ** and * shows significance levels of the 1%, 5% and 10%, respectively.*

6.3.2. Hausman Test

After checking stationarity of all variables, next step is to run Hausman test. It is applied to come conclusion which model should be preferred when a choice is made between Fixed Effect and Random Effect Models. This test accepts the assumption which the Fixed Effect Estimator is consistent and unbiased. Hypotheses used in this test are (Baltagi, 2005):

H_0 : *Random Effect Model [$E(\alpha i / xi) = 0$]*

H_1 : *Fixed Effect Model [$E(\alpha i / xi) <> 0$]*

In Hausman test statistics, it is examined the parameter estimators of the Fixed and Random Effect Models for revealing significance of difference between them (Cameron & Trivedi, 2005). The distinct difference between Fixed or Random Effect Models is whether the constant – time effect is related or unrelated to explanatory variables. When the Random Effect Model is valid, the Fixed Effect Estimator continues to give consistent parameter estimates. The Fixed Effect estimator should not be preferred to the Random Effect Estimator unless all of the fixed-time factors associated with other explanatory variables can be measured. In reality, neither the Fixed Effect Estimator nor the Random Effect estimator is perfect. This is caused by The Random Effect estimator gives biased estimates above the actual effect, whereas the Fixed Effect Estimator gives biased estimates below the real effect (Johnston & Dinardo, 1997).

From the Hausman test result, Random effect is chosen for analysis. The Random Effect let us to use China Dummy variable to observe the differences between China and other developing countries. Beside that we will also use Fixed Effect model to for testing for testing all countries without dummy included.

6.3.3 Panel Results

Panel regression estimation includes 12 developing countries which are Argentina, Brazil, China, Colombia, Greece, Malaysia, Mexico, Peru, Poland, Romania, Thailand and Turkey between the years of 2005-2015 based to equation 34 with the country dummy (China) to observe differences between China and other developing countries as followed Washington type of liberalization. The Random effect model is used for this. We also use Fixed Effect model to observe the estimation for all selected developing countries.

From the table 81, Column (1) indicates the estimations of all selected developing countries by applying Fixed Effect Model. Column (2) indicates the estimations of all selected countries included dummy variable (China) by using Random Effect model. Column (3) indicates the estimations all selected countries including some control variables by using Fixed Effect model and Column (4) indicates the estimations of all selected countries including dummy variable (China) with control variables by applying Random Effect model.

In Column (1), findings show the strong positive impact of FDI on Domestic Value-Added Content of Gross Exports for all selected developing countries. This result supports the commonly findings of existence literature that FDI has role of host country's market and exports (Tiwari and Mutascu, 2011). This strong relationship is valid for Column (2), Column (3) and Column (4). All confirm the same result that indicates inward FDI has strong impact on domestic market.

In column (2) and Column (4) we observe coefficient of China is higher than other developing countries. This indicates that China is gaining from inward FDI more than other developing countries. In other way to say, FDI increase domestic productivity and international competitiveness in China mora than other developing countries.

Table 57. Panel Data Estimations of Domestic Value-Added Exports

	FE (1)	RE (2)	FE (3)	RE (4)
Lnfdi	0.1905*** (0.0003)	0.2042*** (0.0001)	0.1236*** (0.0034)	0.1600*** (0.0001)
Intercept	-3.2961* (0.0571)	-3.9462** (0.0241)	-0.1114 (0.9399)	-1.1600 (0.4299)
China (Dummy)		3.9801*** (0.0006)		3.3055*** (0.0003)
FX			-0.0010*** (0.0023)	-0.0008*** (0.0007)
PSC			0.0112*** (0.0012)	0.0127*** (0.0000)
TR			-0.0615*** (0.0040)	-0.0487*** (0.0166)
YOS			0.2156*** (0.0098)	0.1302*** (0.0714)
R^2	0.9614		0.9769	
F Statistic F Prob	16.763*** (0.0000)	16.236*** (0.0000)	284.56*** (0.0000)	19.610*** (0.0000)
N	132	132	132	132
Country included	12	12	12	12

As we see in Column (3) and Column (4), exchange rate is significant with highly low coefficient and negative for all countries. This result confirms the Lee & Tang (2007) findings that higher aggregate factor productivity generally depreciates the real exchange rate.

Monetary sector credit to private sector results in column (3) and (4) show the significant and positive impact on domestic value added in exports as revealed in literature in this direction (Doojav & Batmunkh, 2018).

Tariff rate results in column (3) and (4) show the significant but negative impact on domestic value added in exports as expected and indicated in the literature many times (Tokarick, 2006). Tariff is obstacle in front of the free trade and exports.

Year of schooling has strong and positive effect on the domestic value added in exports. It means that stock of human capital increases the domestic productivity and international competitive as indicated in literature for countries has reached certain level (Lee, 2017).

6.4. Summary and Discussion

In this chapter we investigated of the relationship between FDI and domestic value-added exports to reveal effect of FDI on domestic market in the selected developing country which liberalized by guidance of the Washington Consensus type of reforms and China, with unique approach as called Beijing Consensus. This investigation helped us to observe the impact of FDI to countries on the domestic market enhancing. It is also important due to it is one of the pioneering studies examining the relationship between FDI and Domestic value-added content of exports. Result showed that inward foreign direct investment has strong positive impact on developing countries. And also, results indicated that China is gaining from inward FDI more than developing countries. These findings are support thesis hypotheses. Also, based on findings China’s way to benefit from FDI is more efficient than other selected developing countries which their trade liberalization guided by Washington Consensus policy suggestions.

Chapter Seven: Conclusion and Policy Implications

7.1. Conclusion

Trade liberalization as a market-oriented reform process that started in majority developing countries in the early 1980s and extended intensively in the 1990s, differed in terms of content and ownership for different countries. The content and philosophy of reform programs have been referenced since the early 1990s to policy recommendations designed by international financial institutions referred as "Washington Consensus". It was conceived as a development prescription, suggesting the development and reform policies of all developing countries regardless of their level of development level or industrial capacities to follow the same trade policies into a uniform and universal pattern. In contrast to the Washington Consensus strictness, Beijing Consensus is ideologically neutral and flexible and shaped by experience and innovation based on current conditions. This pragmatic approach has provided benefits extremely well in Chinese development process as rapid and stable growth. China's integration into the world economy and its successful development has enabled it to be seen as a stable development model by an increasing number of countries.

In this study, we first examined the relationship between trade and growth for Turkey and China after trade liberalization reforms. In the years following the 2000s, Turkey experienced high growth rate and rising trade trend during the Stand-By Agreement with International Money Fund (IMF). The policy sets of the IMF were closely aligned with Washington Consensus policies. Thus, Turkey was considered as one of the examples that Washington Consensus was successful for developing countries in that period. So, examination for China and Turkey gave us insight into the consequences of Washington

Consensus and Beijing Consensus policy choices on the trade growth axis. Empirical analysis revealed causal relationships from exports to GDP and from imports to export in China. On the other hand, casual direction goes from both imports and exports to GDP in Turkey. Also, opposite to China, there is causality from exports to imports in Turkey. These findings suggest that exports are engine of GDP growth for both countries after decision of trade liberalization. In addition, imports promote exports growth for China, and it is reversed for Turkey. Another important result that should be underlined among the findings is that imports cause to economic growth in Turkey. After examining the relationship between economic growth and foreign trade for both countries, we wanted to take a closer look at the relationship between exports and imports. For this objective, we used Trade in Value-Added (TIVA) analysis to measure international trade taken into consideration of production fragmentation that is a new approach developed by OECD and WTO. In general framework, there is a structural shift in the Chinese economy from manufacturing-led export growth towards domestic supply and consumption with an economy in which the role of services increases. Import content of exports of China decreased from above OECD average and EU28 average in 2005 and comes to similar to the G20 average by 2016. Decline in total manufactures despite of increasing gross exports indicates a shift in sourcing of intermediate goods to domestic area. Similar downtrend occured in the share of China's domestic value-added content driven by foreign final demand. The proportion of imported intermediate inputs built in exports had significant decrease. It suggests that face of China's production turns to domestic consumption away from foreign final demand. In general view of Turkey, there are less changes compared to China regarding to interdependencies of export and import. Foreign value-added content of gross exports slightly increased between 2005 and 2016. Yet, it is below the EU28 averages, OECD averages and similar to the G20 averages in both years of 2005 and 2016. A slight increase in the imports content of the exports brings that Turkey has difficulties to strengthen the domestic market in order to reduce dependence on imports. Turkey's total contribution of the domestic value added in foreign final demands which is driven by abroad consumption had also a slight increase during the years. Results suggested the inference that imports may simply be consumed, as it did not generate much positive impacts on exports either, only contributed to more imports for Turkey. Yet, China's imports might have promoted productivity indirectly via exports.

Thereinafter, we conducted same econometric analysis for some developing countries which are Argentina, Brazil, Colombia, Dominican Republic, Ecuador, Greece, Malaysia, Mexico, Peru, Poland, Romania and Thailand to interpret previous findings at macro level. Selected countries were middle income countries as China and Turkey. Also, they carried out trade liberalization under the influence or guidance of the Washington Consensus policy recommendations. This analysis gave the opportunity of drawing a general framework regarding of trade liberalization policy choice.

The first thing that draw attention from the empirical analysis results was causality from imports to GDP, valid for almost all countries with exports to GDP causality. China was only exception in terms of having exports causal direction to GDP without imports causality. Brazil, Colombia, Dominican Republic, Ecuador, Malaysia, Peru, Poland and Thailand have causality from GDP to export. Imports caused GDP was valid for all countries except China, Peru and Thailand. There was bilateral causal relationship between export and import for Colombia, Peru, Poland and Thailand. One-way direction from imports to exports holds true for China, Dominican Republic, Malaysia and Mexico. The opposite way round applied for Brazil, Romania and Turkey that means causality comes from export to import for these countries. Argentina, Brazil, Colombia, Dominican Republic, Malaysia, Mexico and Peru had causal direction from GDP to import.

Besides the empirical analysis, we also analyzed some economics and trade indicators to deepen analysis for all selected countries between the years of 1980-2017. One of the prominent results from the economic indicators was changes in per capita income. China experienced increase in GDP per capita approximately 44 times higher of level at 1980 which is the highest rise by far between selected countries. Thailand came second by increase of around 9 times. Poland and Turkey took third and fourth rankings by increase around 7 and 6 times, respectively. Second indicator was about average growth rate. Once again China kept the highest average growth rate over the years by 9.6%. Mexico took second place with the average of 5.9% and Thailand took third by 5.2%. Turkey and Dominican Republic came after with the average rate of 4.6%. Greece, Argentina and Romania had the lowest average growth rate. Third indicator shows the number of years countries experience negative growth rate. This indicator is important in terms of giving a clue whether countries' growth experiences are fluctuating or more stable. Argentina has experienced 15 years of negative growth while Greece has 13 years of negative growth rate experience. Brazil, Malaysia, Peru and Romania have 7 years of negative growth experience between the years of 1980-2017. In this period, China has no negative growth rate experience while Turkey has 5 years of negative growth rate. Poland and Colombia have 1 year of experiencing negative growth rate.

Trade indicators also showed interesting results. On the ratio of total trade corresponding to GDP in 2017; Malaysia, Thailand and Poland had highest ratio of trade to GDP. Brazil, Argentina and Colombia had the lowest trade/growth ratio. Turkey and China were the countries showing the biggest change when it came to 2017 by increasing more than 3 times according to the level of 1980. On the high-tech exports' ratio of manufactured exports side, Malaysia, China and Thailand had the highest share of high technology exports in total manufactured exports Turkey, Peru and Ecuador had the lowest share.

The countries with the highest increase in proportion were Colombia, Poland and Romania between 2007 and 2017. Another important indicator is the import content of exports. Malaysia and Mexico had the highest ratio of import content in their exports in 2016. Thailand, Poland, Romania, Greece, China and Turkey come after, respectively. China and Turkey both had 16% share of import content in their exports while Argentina, Peru and Brazil had the lowest shares. Also, China had the highest proportional declining between the years of 2005 and 2016.

The most important inference derived from this analysis is that China has benefited more from the relationship between foreign trade and economic growth among other developing countries after trade liberalization. China's economy has a more stable and high growth trend. In addition, its domestic market has strengthened and gained international competitiveness. Yet, it was observed that countries with causality from import to economic growth could not achieve economic stability and experienced negative growth for more than one year with lower average growth rate than China. Trade and growth causal relationships and macroeconomic indicators are heterogeneous for different countries, supporting thesis hypothesis that Beijing Consensus trade liberalization leads to different outcomes from Washington Consensus type of liberalization.

In the third stream we attempted to reveal the specific relationship between import components and GDP for Turkey due to deduce from causal relationship from imports to growth as resulted in previous empirical analysis in study for Turkey and most of other developing countries. Results showed that imported intermediate goods had strong causal impact on GDP. Also, imported consumption goods and capital goods had significant causal effect on GDP. In addition, imported intermediate goods have impact on imported consumption and imported capital goods.

Results brought the assumption that imports cannot help enough to improve domestic productivity and technological improvements. It is indicating the dependence on foreign technology and lacking of industrial catching up along the economic growth. Imports may simply be consumed, as it does not generate much positive impacts on exports either, only contribute to more imports. Besides, results supported inference that China's imports might have promoted productivity indirectly via exports.

In the last stream, a link was searched between FDI and domestic market by using domestic value-added content of exports. As a pioneer investigation on this regard, our empirical analysis showed that FDI has critic role in domestic production for all selected countries. Moreover, China benefits from this significantly more than other countries.

Over all, relationship between trade and growth differs by trade liberalization policy preference. Besides, China has benefited from trade much more than other developing countries guided by Washington Consensus policy recommendations. this brings a uniqueness to China among the other developing countries.

From the point of view our findings, we believe that new discussion should be held on China's unique experience during the trade liberalization. Although we know very well the shortcomings and limitations of our empirical study, we also believe that it should stimulate to more investigations on China's this uniqueness in both empirical and theoretical perspective. China's this success may not be caused by only right implementation of known policies from theories on the trade-growth axis as general understanding of paradigm. One possibility is that this success of China emphasizes the necessity of a new theoretical approach challenging existing ones.

7.2. Policy Implications

It should be understood that a development prescription that suggests all developing countries regardless of their unique condition to apply the same trade policy reforms in a uniform and universal model, most likely will not produce the expected success in the countries. Both trade liberalization and other economic reforms should be carried out with careful steps, taking into account the unique cultural and historical background of nations as well as strong integration strategy to international market. The Chinese economy has acted with this virtue and has experienced steady growth and development with a successful experience of international integration. China's 40-year trade liberalization journey carries important inspiration for developing countries.

Foreign trade surplus is key factor for economic growth and this is closely related to gaining competitive power in international markets and keeping up with technological development. Developing countries, whose technological progress is lagging compared to developed countries, can solve this situation by imports. The main purpose of imports should be to increase local production efficiency and keep pace with technological development and international market power in order to increase exports. however, in most developing countries, imports are likely to occur either for consumption in the local market or as intermediate goods for export, without increasing competitiveness as international level. Examining China from this view, contribution of imports to the domestic market and therefore the economic growth effect is important.

Turkey, despite the realization of trade liberalization reforms with China in the years that follow each other, foreign trade deficit with ongoing economic growth experience has been showed weakness against the crisis. This situation should make us think that the economic reforms and practices implemented in the country are not generating a healthy and steady growth experience. Hence, Turkey should review current trade policies and to gain international competitiveness should produce policies can creates solution for economic problems. In addition, the increase of local production efficiency by imports should be considered as a situation that can eliminate the existing foreign trade deficit. It should be ensured that know-how and technology transferred by imports will strengthen the local market against the international market. This may promote exports and accelerate the economic growth with a steady trend.

The overall performance of developing countries seems to us that Washington Consensus-type trade liberalization does not offer a successful and stable growth experience across countries. In contrast, China has experienced a very successful development and growth adventure with the Beijing consensus type approach. this should show us that the development policy and reform proposals of developed countries may not be exactly what developing countries need.

7.3. Future Perspectives

i. Further investigation and analysis should be conducted on the trade-growth axis. Particularly, the individual economic and trade experience of countries should be scrutinized for a deeper and detailed analysis.

ii. Regarding to trade and growth axis, the effects of financial liberalization, foreign direct investments, political and bureaucratic efficiency and labor should also be reviewed for developing countries.

iii. Based on the commercial liberalization and growth relationship of developing countries, it would be appropriate to say that China has a more successful growth and development experience. In this respect, whether China's economic approach (Beijing Consensus) can be transformed into a development model for developing countries, this should be investigated.

References

[1]. Adak, M. (2010). Foreign trade and economic growth: The case of Turkey. *Middle Eastern Finance and Economics, 8*(1), 137-145.

[2]. Ağayev, Seymur, 2010. "Doğrudan Yabancı Sermaye Yatırımları ve Ekonomik Büyüme İlişkisi: Geçiş Ekonomileri Örneğinde Panel Eştümleşme ve Panel Nedensellik Analizleri." *Gazi Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 12(1):159-184.

[3]. Ahmad, J., & Kwan, A. C. (1991). Causality between exports and economic growth: empirical evidence from Africa. *Economics letters, 37*(3), 243-248.

[4]. Ahmad, F., Draz, M. U., & Yang, S. C. (2018). Causality nexus of exports, FDI and economic growth of the ASEAN5 economies: evidence from panel data analysis. *The Journal of International Trade & Economic Development*, 27(6), 685-700.

[5]. Amiti M. and Wakelin K. (2002): "Investment liberalization and international trade", *Journal of International Economics*, Vol. 61(1): 101–126.

[6]. Akcan, A. T., & Metin, I. (2018). The Effects of Foreign Trade on Economic Growth: Turkey Case *Turkish Studies: Economics, Finance And politics*, 13(14), 1-14.

[7]. Asseery, A., & Peel, D. A. (1991). The effects of exchange rate volatility on exports: Some new estimates. Economics letters, 37(2), 173-177.

[8]. Asteriou Dimitrio; Xeni, Dassiou; Dionysius G., (2005). "FDI and Growth: Evidence from A Panel of European Transition Countries", Spoudai, 55(1): 9-30.

[9]. Awokuse, T. O. (2003). Is the Export –Led Growth Hypothesis Valid for Canada? The *Canadian Journal of Economics*, 36(1), 126-136.

[10]. Awokuse, T. O. (2008). Trade openness and economic growth: is growth export-led or import-led? *Applied Economics*, *40*(2), 161-173.

[11]. Bahmani-Oskooee, M., Mohtadi, H., & Shabsigh, G. (1991). Exports, growth and causality in LDCs: A re-examination. *Journal of Development Economics, 36*(2), 405-415.

[12]. Balassa, B. (1978). Exports and economic growth: further evidence. *Journal of development Economics, 5(*2), 181-189.

[13]. Baltagi, B. H., (2005), *Econometric Analysis of Panel Data*, Third Edition, John Wiley&Sons Inc, England.

[14]. Barrios S., Görg H., and Strobl E. (2005): "Foreign direct investment, competition and industrial development in the host country", *European Economic Review*, Vol. 49(7): 1761–1784.

[15]. Barro, R.J. and X. Sala-i-Martin (1995). Technological Diffusion, Convergence and Growth, *NBER Working Paper Series*, No. 5151.

[16]. Barua, R. (2013). A study on the impact of FDI inflows on exports and growth of an economy: evidence from the context of Indian economy. *Researchers World*, 4(3), 124.

[17]. Bhagwati, J. N. (1978). Appendix to" Anatomy and Consequences of Exchange Control Regimes". In Anatomy and Consequences of Exchange Control Regimes (pp. 219-221). NBER.

[18]. Bhagwati, J. N. (1988). Protectionism Cambridge, Mass.

[19]. Beckerman, W. (1962). Projecting Europe's growth. *The Economic Journal*, 72(288), 912-925.

[20]. Berg, H. V. D., & Schmidt, J. R. (1994). Foreign trade and economic growth: time series evidence from Latin America. *Journal of International Trade & Economic Development*, *3*(3), 249-268.

[21]. Bevan, Alan, A. and Estrin, Saul, 2004. "The Determinants of Foreign Direct Investment into European Transition Economies." *Journal of Comparative Economics, 32:775-787.*

[22]. Birdsall, N., de la Torre, A., & CAICEDO, F. V. (2010). The Washington Consensus. Assessing a Damaged Brand. *World Bank Policy Research Working Paper*, (5316).

[23]. Blomström M. (1990): "Transnational Corporations and Manufacturing Exports from Developing Countries", Ed. United Nations Centre on Transnational Corporations, New York.

[24]. Borensztein, E., De Gregorio, J., & Lee, J. W. (1998). How does foreign direct investment affect economic growth? *Journal of international Economics*, 45(1), 115-135.

[25]. Braun, Phillip A, & Mittnik, Stefan. (1993). Misspecifications in vector autoregressions and their effects on impulse responses and variance decompositions. *Journal of Econometrics, 59(*3), 319-341.

[26]. Brian J.A., Hanson G.H., and Harrison A.E. (1997): "Spillovers, Foreign Investment, and Export Behavior", *Journal of International Economics*, Vol. 43: 103-132.

[27]. Cameron, A.C. ve Trivedi, P.K., (2005), *Microeconometrics: Methods and Applications*, Cambridge University Press, New York.

[28]. Cao, W. (2005). Empirical Research on The Relationship Among China's Economic Growth, Exchange Rate Fluctuation and Foreign Trade. *Hainan Finance*, 9, 19-22.

[29]. Çetinkaya, M., & Erdogan, S. (2010). Var analysis of the relation between GDP, import and export: Turkey case. *International Research Journal of Finance and Economics*, *55*(1), 135-145.

[30]. Chang, R., Kaltani, L., & Loayza, N. (2005). *Openness can be good for growth: The role of policy complementarities.* The World Bank.

[31]. Chen, H. (2009) A Literature review on the relationship between foreign trade and economic growth. *International Journal of Economics and Finance* 1(1): 127-130.

[32]. Chen, E.K.Y. (1992). Changing Pattern of Financial Flows in the Asia-Pacific Region and Policy Responses, *Asian Development Review*. 10:46-85.

[33]. Chimobi, O. P. (2010). The Estimation of Long run Relationship between Economic Growth, Investment and Export in Nigeria. *International Journal of Business and management*, 5(4), 215.

[34]. Chow, P. C. (1987). Causality between export growth and industrial development: Empirical evidence from the NICs. *Journal of Development Economics*, *26*(1), 55-63.

[35]. Currie, L. (1983). The "Multiplier" in Economic Literature. *Journal of Economic Studies (Bradford)*, *10*(3), 42-48.

[36]. Dar, A., & Amirkhalkhali, S. (2003). On the impact of trade openness on growth: Further evidence from OECD countries. *Applied Economics*, *35*(16), 1761-1766.

[37]. Değer, Kemal, M.; Emsen, Selçuk, Ö, 2006. "Geçiş Ekonomilerinde Doğrudan Yabancı Sermaye Yatırımları ve Ekonomik Büyüme İlişkileri: Panel Veri Analizleri (1990-2002)". C.Ü. *İktisadi ve İdari Bilimler Fakültesi Dergisi*, 7(2): 121-136.

[38]. Dielman, T. E. (1989). *Pooled Cross-Sectional and Time Series Data Analysis*. New York: Marcel Dekker

[39]. Dobson W. and Chia S.Y. (1997): "Multinationals and East Asian Integration", Ottawa: International Development Research Centre; Institute of Southeast Asian Studies, Singapore.

[40]. Dollar, D. (1992). Outward-Oriented Developing Economies Really Do Grow More Rapidly: Evidence from 95 LDCs, 1976-1985. *Economic Development and Cultural Change, 40*(3), 523-544.

[41]. Doojav, G. O., & Batmunkh, U. (2018). Monetary and macroprudential policy in a commodity exporting economy: A structural model analysis. *Central Bank Review*, 18(3), 107-128.

[42]. Doytch, N., & Uctum, M. (2011). Does the worldwide shift of FDI from manufacturing to services accelerate economic growth? A GMM estimation study. *Journal of International Money and Finance*, 30(3), 410-427.

[43]. Easterly, W., & Levine, R. (2001). What have we learned from a decade of empirical research on growth? It's Not Factor Accumulation: Stylized Facts and Growth Models. *The World Bank Economic Review, 15*(2), 177-219.

[44]. Edwards, S. (1998). Openness, Productivity and Growth: What do We Really Know? *The Economic Journal (London), 108*(447), 383-398.

[45]. Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: journal of the Econometric Society*, 55, 251-276.

[46]. Esfahani, H. S. (1991). Exports, imports, and economic growth in semi-industrial countries, *Journal of Development Economics*, 35, 93-116.

[47]. Fan, B., Mao X. & Wang, S. (2005). On the contribution of export to economic growth: 1952-2003. *International Trade Journal*, *8*, 5-9.

[48]. Frankel, J. A., & Romer, D. H. (1999). Does Trade Cause Growth? *The American Economic Review, 89*(3), 379-399.

[49]. Gardiner, Joseph C.; Luo, Zhehui; Roman, Lee Anne (2009). "Fixed effects, random effects and GEE: What are the differences?". *Statistics in Medicine*. 28: 221–239. doi:10.1002/sim.3478.

[50]. Garnaut, R., Song, L., & Fang, C. (2018). *China's 40 Years of Reform and Development.* Canberra: ANU Press.

[51]. Ghartey, E. E. (1993). Causal relationship between exports and economic growth: Some empirical evidence in Taiwan, Japan and the US. *Applied Economics, 25*(9), 1145-1152.

[52]. Ghatak, S., Milner, C., & Utkulu, U. (1997). Exports, export composition and growth: cointegration and causality evidence for Malaysia. *Applied Economics, 29*(2), 213-223.

[53]. Giles, J. A., & Williams, C. L. (2000). Export-led growth: a survey of the empirical literature and some non-causality results. Part 1. *The Journal of International Trade & Economic Development*, *9*(3), 261-337.

[54]. Grossman, G. M., & Helpman, E. (1991). *Innovation and growth in the global economy*. MIT press.

[55]. Gudeta, D. O., Arero, B. G., & Goshi, A. Y. (2017). Vector autoregressive modelling of some economic growth indicators of Ethiopia. *American Journal of Economics*, *7*(1), 46-62.

[56]. Gujarati, D. (2003). *Basic econometrics* (4th ed.). London: McGraw-Hill.

[57]. Halper, S. (2010). *The Beijing Consensus: How China's authoritarian model will dominate the twenty-first century*. New York: Basic Books

[58]. Hamilton, J. D. (1994). *Time series analysis*. Princeton University Press.

[59]. Hansen, H., & Rand, J. (2006). On the causal links between FDI and growth in developing countries. *World Economy*, 29(1), 21-41.

[60]. Harach, M., & Rodriguez-Crespo, E. (2014). Foreign direct investment and trade: A bi-directional gravity approach (No. 467). Kiel Advanced Studies Working Papers.

[61]. Harrod, R. F. (1933). *International Economics*. Cambridge: Nisbet & Cambridge University Press

[62]. Heckscher, E. (1919): "The effect of foreign trade on the distribution of income", Ekonomisk Tidskriff, Vol. 21, 497–512. Translated as chapter 13 in American Economic Association.

[63]. Heller, H. (1972). International trade: *Theory and empirical evidence*. Englewood Cliffs: Prentice-Hall.

[64]. Helpman, E. and Krugman, P. (1985): "*Market Structure and Foreign Trade*", MIT Press, Cambridge, MA.

[65]. Helpman, E., Melitz, M., and Rubinstein, Y. (2008): "Estimating trade fows: Trading partners and trading volumes", Quarterly Journal of Economics, 123(2): 441 487.

[66]. Holzman, F. D. (1976). *International trade under communism*. Basic Books.

[67]. Horstmann I. and Markusen J.R. (1992): ''Endogenous Market Structures in International Trade'', Journal of International Economics, Vol. 32(1-2):109–29.

[68]. Irwin, D. A., & Terviö, M. (2002). Does trade raise income? Evidence from the twentieth century. *Journal of International Economics* 58(1): 1-18.

[69]. Islam, N. (1995). Growth empirics: a panel data approach. *The quarterly journal of economics*, *110*(4), 1127-1170.

[70]. Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of economic dynamics and control*, *12*(2-3), 231-254.

[71]. Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica*, *59*(6), 1551-1580.

[72]. Johnson, H. (1958). *International trade and economic growth: Studies in pure theory*. London: Allen & Unwin.

[73]. Johnston, J. ve Dinardo, J.,(1997), *Econometric Methods*, Fourth Edition, McGraw-Hill Inc, New York.

[74]. Jung, W. S., & Marshall, P. J. (1985). Exports, growth and causality in developing countries. *Journal of development economics*, *18*(1), 1-12.

[75]. Kazgan, G. (1988). *Ekonomide dışa açık büyüme*. Istanbul: Altın Kitaplar Yayınevi.

[76]. Keyder, Ç. (2004). *Ulusal Kalkınmacılığın İflası*. Ankara: Metis Yayınları.

[77]. Kim, S., Lim, H., & Park, D. (2007). Could imports be beneficial for economic growth: Some evidence from republic of Korea. *Economics and Research Department Working Paper Series No. 103*. Asian Development Bank.

[78]. Kotil, E., & Konur, F. (2010). The relationship between growth and foreign trade in Turkey: A Granger causality approach (1989-2007). *Middle Eastern Finance and Economics*, *1*(6), 32-40.

[79]. Kojima. K. (1975): "International Trade and Foreign Investment: Substitutes or Complements", *Hitotsubashi Journal of Econometrics*, Vol. 16(1): 1–12.

[80]. Kojima K. (1977): "Transfer of Technology to Developing Countries-Japanese Type versus American Type ", *Hitotsubashi Journal of Economics*, Vol. 17(2): 1-14.

[81]. Kojima K. (1982): "Macroeconomic versus International Business Approach to Direct Foreign Investment", *Hitotsubashi Journal of Economics*, Vol. 23(1): 1-19.

[82]. Koves, A., & Marer, P. (1991). *Foreign Economic Liberalization: Transformation in socialist and market economies*. Boulder, CO: Westview Press.

[83]. Koyuncu, F. T., & Koyuncu, F. T. (2010). Türkiye'de Seçilmiş Makroekonomik Değişkenlerin Doğrudan Yabancı Sermaye Yatırımları Üzerindeki Etkisinin Yapısal VAR Analizi: 1990-2009 Dönemi", *Ekonomi Bilimleri Dergisi*, 2(1), 55-62.

[84]. Krueger, A. O. (1998). Why trade liberalization is good for growth. *The economic journal*, *108*(450), 1513-1522.

[85]. Krugman, P. (1984). *Import protection as export promotion*. H. Kierzkowslci, ed.

[86]. Krugman, P.R., Obstfeld, M. (1991) *International Economics*, Second Edition, New York: Harper Collins Publishers

[87]. Kunst, R. M., & Marin, D. (1989). On exports and productivity: a causal analysis. *The Review of Economics and Statistics*, 699-703.

[88]. Kwan, A. C., & Cotsomitis, J. A. (1991). Economic growth and the expanding export sector: China 1952–1985. *International Economic Journal*, *5*(1), 105-116.

[89]. Kwan, A. C., & Kwok, B. (1995). Exogeneity and the export-led growth hypothesis: the case of China. *Southern Economic Journal*, *61*(4), 1158-1166.

[90]. Lamfalussy, A. (1963). The United Kingdom and the six: An essay on economic growth in Western Europe (pp. 59-116). London: Macmillan.

[91]. Lancaster, K. (1980). Intra-industry trade under perfect monopolistic competition. *Journal of international Economics*, 10(2), 151-175.

[92]. Lee, J., & Tang, M. K. (2007). Does productivity growth appreciate the real exchange rate? *Review of International Economics*, 15(1), 164-187.

[93]. Lee, Jong-Wha, & Barro, Robert J. (1994). Sources of economic growth. *Carnegie-Rochester Conference Series on Public Policy*, *40*(1), 1-46.

[94]. Lee, K. (2006). The Washington Consensus and East Asian Sequencing: Understanding Reform in East and South Asia. In *Understanding market reforms* (pp. 99-140). Palgrave Macmillan, London.

[95]. Lee, J.-W. (2017). China's economic growth and convergence. China's economic growth and convergence, 40, 2455–2474.*Wiley Online Library*. doi:10.1111/twec.12554

[96]. Li, J. (1992). Productivity and China's economic growth. *The Economic Studies Quarterly*, *43*(4), 337-350.

[97]. Li, J. et al., (1996). “Productivity and China’s Economic Growth.” *Quantitative & Technology Economic Research,*

[98]. Li, K., & Jiang, W. (2018). *28.* China’s foreign trade: Reform, performance and contribution to economic growth. In R. Garnaut, L. Song & C. Fang (Eds.), *China’s 40 Years of Reform and Development* (pp. 575-593). Australian National University Press.

[99]. Li, Y., Chen Z. & Wang X. (2010) An empirical study on the contribution of foreign trade to the economic growth of Jiangxi province, China. *iBusiness 2*(2): 183-187.

[100]. Li, Y., Chen, Z., & San, C. (2010). Research on the relationship between foreign trade and the GDP growth of East China empirical analysis based on causality. *Modern Economy*, *1*(02), 118-124.

[101]. Lipsey, R. E. (2000). Affiliates of US and Japanese multinationals in East Asian production and trade. *In The role of foreign direct investment in East Asian economic development* (pp. 147-189). University of Chicago Press.

[102]. Lipsey R.E. (2002): “Home and host country effects of FDI”, Working Paper number 9293, *National Bureau of Economic Research*, Cambridge.

[103]. Liu, X. P. (2001). A Positive Analysis on Import-export Increase and Economic Growth. *China Economic Issue*, 4.

[104]. Liu, X., 2001, A positive analysis on import-export increase and economic growth, *China Economic Issues*.

[105]. Liu, X., Burridge, P., & Sinclair, P. J. (2002). Relationships between economic growth, foreign direct investment and trade: evidence from China. *Applied economics*, *34*(11), 1433-1440.

[106]. Liu, X., Song, H., & Romilly, P. (1997). An empirical investigation of the causal relationship between openness and economic growth in China. *Applied economics*, *29*(12), 1679-1686.

[107]. Love, J., & Chandra, R. (2005). Testing export-led growth in South Asia. *Journal of Economic Studies*, *32*(2): 132-145.

[108]. Lütkepohl, H. (1993). *Introduction to multiple time series analysis* / Helmut Lütkepohl (2nd ed.). London: Springer-Verlag.

[109]. Lütkepohl, H., (2005). *New Introduction to Multiple Time Series Analysis*. Springer Verlag, Berlin

[110]. Mankiw, N. G. (2004). *Principles of economics*. Mason, USA: Thomson, South-Western.

[111]. Markusen, J.R. and Maskus, K.E. (2002): “Discriminating among Alternative Theories of the Multinational Enterprise”, *Review of International Economics*, Vol. 10(4): 694-707.

[112]. Markusen, J.R. (1997): "Trade versus Investment Liberalization", *NBER Working Paper* number 6231, National Bureau of Economic Research.

[113]. Markusen, J.R. (1998): "Multinational Firms, Location and Trade", *The World Economy*, Vol. 21(6): 733–756.

[114]. Marcy, G. (1960). How far can foreign trade and customs agreements confer upon small nations the advantages of large nation ? *In Economic consequences of the size of nations* (pp. 265-281). Palgrave Macmillan, London.

[115]. Meier, G. M. (1964). International trade and development. *International trade and development*

[116]. Metzler, L. A. (1949). Tariffs, the terms of trade, and the distribution of national income. *Journal of Political Economy*, 57(1), 1-29.

[117]. Miroudot, S., Lanz, R., & Ragoussis, A. (2009). Trade in Intermediate Goods and Services (OECD trade policy papers; no. 93). Paris: OECD Publishing.

[118]. Muhsin, K. A. R., & Tatlısöz, F. (2008). Türkiye'de Doğrudan Yabancı Sermaye Hareketlerini Belirleyen Faktörlerin Ekonometrik Analizi. *karamanoğlu mehmet bey üniversitesi sosyal ve ekonomik araştırmalar dergisi*, 2008(1), 436-458.

[119]. Mundell R.A. (1968). *International Economics*, New York: Macmillan.

[120]. OECD (2018), *The changing nature of international production: Insights from Trade in Value Added and related indicators*. https://www.oecd.org/industry/ind/tiva-2018-flyer.pdf (Accessed on 10 January 2020)

[121]. OECD (2018), *Trade in Value Added: China*. https://www.oecd.org/industry/ind/TIVA-2018-China.pdf (Accessed on 10 January 2020)

[122]. OECD (2018), *Trade in Value Added: Turkey*. https://www.oecd.org/industry/ind/TIVA-2018-Turkey.pdf (Accessed on 10 January 2020)

[123]. OECD (2019), *Import content of exports (indicator)*. doi: 10.1787/5834f58a-en (Accessed on 27 March 2019)

[124]. OECD, W. (2012). Trade in Value Added: Concepts, Methodologies and Challenges (*joint OECD-WTO note*).

[125]. OECD, (2021). Domestic Value-Added Content of Gross Exports. https://www.oecd-ilibrary.org/trade/domestic-value-added-in-gross exports/indicator/english_3959a0c6-en. Accessed date, 10-03-2021

[126]. Ohlin B. (1933). *Interregional and International Trade*, Harvard University Press, Cambridge, MA.

[127]. Ohlin, B. (1967). *Interregional and International Trade*. London: Oxford University Press.

[128]. Oxley, L. (1993). Cointegration, causality and export-led growth in Portugal, 1865–1985. *Economics Letters*, *43*(2), 163-166.

[129]. Ozturk, I. & Acaravci, A. (2010). Testing the export-led growth hypothesis: Empirical evidence from Turkey. *The Journal of Developing Areas, 44*(1), 245-254.

[130]. Ögütçü, M. (2002). Foreign Direct Investment and Regional Development: Sharing experiences from Brazil, China, Russia and Turkey, *OECD Paper*, Paris.

[131]. Parteka, A., & Tamberi, M. (2013). What determines export diversification in the development process? Empirical assessment. *The World Economy*, *36*(6), 807-826.

[132]. Sun, P., & Heshmati, A. (2010). International trade and its effects on economic growth in China.

[133]. Perotti, R. (2007). Fiscal Policy in Developing Countries: A Framework and Some Questions. *Policy Research Working Paper*; No. 4365. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/7359 License: CC BY 3.0 IGO.

[134]. Ramo, J. C. (2004). *The Beijing Consensus*, London: The Foreign Policy Centre.

[135]. Report on the Work of the Government (2010), http://english1.english.gov.cn/official /2010-03/15/content_1556124.htm Accessed date 15-03-2021

[136]. Ricardo, D. (1821). *On the principles of political economy.* London: J. Murray.

[137]. Riezman, R.G., Summers, P.M. and Whiteman, C.H. (1996). The engine of growth or its handmaiden? *Empirical Economics, 21*(1), 77-110.

[138]. Robert J. Barro, & Xavier Sala-I-Martin. (1997). Technological Diffusion, Convergence, and Growth. *Journal of Economic Growth (Boston, Mass.), 2*(1), 1-26.

[139]. Robinson, J. (1937). Essays in the Theory of Employment. Macmillan.

[140]. Rodriguez, F., & Rodrik, D. (1999). Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence. *NBER Macroeconomics Annual, 15*, 261-325.

[141]. Rodrik, D. (1996). Understanding economic policy reform. *Journal of economic Literature*, *34*(1), 9-41.

[142]. Rodrik, D. (2006). Goodbye Washington Consensus, Hello Washington Confusion? A Review of the World Bank's "Economic Growth in the 1990s: Learning from a Decade of Reform". *Journal of Economic Literature, 44*(4), 973-987.

[143]. Rodrik, D. (2007). The global governance of trade as if development really mattered. In *One Economics, Many Recipes* (pp. 213-236). Princeton: Princeton University Press.

[144]. Rodrik, D. (2006). What's so special about China's exports? *China & World Economy*, 14(5), 1-19.

[145]. Rybczynski, T. M. (1955). Factor endowment and relative commodity prices. *Economica*, 22(88), 336-341.

[146]. Sachs, J. D., Warner, A., Aslund, A., & Fischer, S. (1995). Economic reform and the process of global integration. *Brookings papers on economic activity*, *1995*(1), 1-118.

[147]. Segerstrom, P. S., Anant, T. C., & Dinopoulos, E. (1990). A Schumpeterian model of the product life cycle. *The American Economic Review*, 1077-1091.

[148]. Shafaeddin, M. S. (2005). Trade liberalization and economic reform in developing countries. *The IMF, World Bank and Policy Reform*, *155*, 2-20.

[149]. Shan, J., & Sun, F. (1998). On the export-led growth hypothesis for the little dragons: an empirical reinvestigation. *Atlantic Economic Journal*, *26*(4), 353-371.

[150]. Shan, J., & Sun, F. (1998). On the export-led growth hypothesis: The econometric evidence from China. *Applied Economics*, 30(8), 1055-1065.

[151]. Shan, J., & Sun, F. (1998a). Export-led growth hypothesis for Australia: an empirical re-investigation. *Applied Economics Letters*, *5*(7), 423-428.

[152]. Shan, J., & Sun, F. (1998b). On the export-led growth hypothesis: the econometric evidence from China. *Applied Economics*, *30*(8), 1055-1065.

[153]. Shan, J., & Sun, F. (1998c). Export-led growth hypothesis for Australia: an empirical re-investigation. *Applied Economics Letters*, *5*(7), 423-428.

[154]. Sharer, R. (1999). Trade: A engine of growth for Africa. *Finance and Development*, *36*(4), 26-29.

[155]. Sharma, S. C., Norris, M., & Cheung, D. W. W. (1991). Exports and economic growth in industrialized countries. *Applied Economics*, *23*(4), 697-708.

[156]. Sheehey, E. J. (1992). Exports and growth: additional evidence. *The Journal of Development Studies*, *28*(4), 730-734.

[157]. Shen, C. (1999) Empirical analysis on China's export-oriented economic growth: 1977–1998', *World Economy*, No. 12

[158]. Sims, C. (1980). Macroeconomics and reality. *Econometrica*, *48*(1), 1–48.

[159]. Sinha, T., & Dipendra, S. 1999. The relationship between openness and economic growth: Evidence from 124 countries. *Seoul Journal of Economics 12*(1): 67-83.

[160]. Smith, A. (1776). *An inquiry into the nature and causes of the wealth of nations: Volume One.* London: printed for W. Strahan; and T. Cadell, 1776.

[161]. Smits, J., & Permanyer, I. (2019). The subnational human development database. *Scientific data*, 6(1), 1-15.

[162]. Sodersten, B., & Reed, G. (1994). *International Economics*. London: MacMillan Press.

[163]. Stiglitz, J. E. (2002). *Globalization and its discontents*. New York: W.W. Norton

[164]. Suharsono, A., Aziza, A., & Pramesti, W. (2017). Comparison of vector autoregressive (VAR) and vector error correction models (VEC) for index of ASEAN stock price. *AIP Conference Proceedings*, *1913*(1), AIP conference proceedings, 2017-12-05, Vol.1913 (1).

[165]. TCMB (2002), *Küreselleşmenin Türkiye Ekonomisine Et*kileri, Banknot Matbaası Genel Müdürlüğü, Ankara, Mayıs 2002.

[166]. Temiz, D., & Gökmen A. (2010). Analysis of the export and economic growth in Turkey over the period of 1950-2009. *International Journal of Economic and Administrative Studies 3*(5), 123-142.

[167]. Teker, Suat; Tuzla, Hayri; Pala, Aynur, (2014). "Foreign Direct Investments: Asian and European Transition Economies." *International Journal of Economics and Financial Issues*, 4(1):71-82.

[168]. Thangavelu, S. M., & Rajaguru, G. (2004). Is there an export or import-led productivity growth in rapidly developing Asian countries? A multivariate VAR analysis. *Applied Economics*, *36*(10), 1083-1093.

[169]. Thirwall, A.P. (2011). *Economics of Development Theory and Evidence* (9th ed.). London: Palgrave-Macmillan.

[170]. Tiwari, A. K., & Mutascu, M. (2011). Economic growth and FDI in Asia: A panel-data approach. *Economic analysis and policy*, 41(2), 173-187.

[171]. Tiwari, A.K. and M. Kalita (2011). Governance and Foreign Aid in ASIAN Countries, Economics Bulletin. 31: 453-465.

[172]. Tokgöz, E. (2001). *Türkiye'nin İktisadi Gelişme Tarihi* (9th ed.). İmaj Yayınevi. Ankara.

[173]. Tong, J. (1995). Price *Change of Stock and Economic Running.* Tianjin: Nankai University Press.

[174]. Tokarick, S. (2006). Does Import Protection Discourage Exports? *IMF Working Papers* 2006/020

[175]. Tsen, W. (2006). Granger causality test among openness to international trade, human capital accumulation and economic growth in China: 1952-1999. *International Economic Journal 20*(3): 285-302.

[176]. Utkulu, U., & Durmuş Ö. (2004). Does trade liberalization cause a long-run economic growth in Turkey. *Economics of Planning*, *37*, 245-266.

[177]. Van Den Berg, H. (1996). Does simultaneity exaggerate empirical tests of the trade-growth relationship? *Applied Economics Letters*, *3*(4), 225-231.

[178]. Vernon, R. (1966). International trade and international investment in the product cycle. *Quarterly journal of economics*, 80(2), 190-207.

[179]. Wacziarg, R. (2001). Measuring the dynamic gains from trade. *The World Bank Economic Review 15*(3): 393-429.

[180]. Wacziarg, R., & Welch, K. H. (2008). Trade liberalization and growth: New evidence. *The World Bank Economic Review*, *22*(2), 187-231.

[181]. Wang, M. (2009). Manufacturing FDI and economic growth: evidence from Asian economies. Applied Economics, 41(8), 991-1002.

[182]. Williamson, J. (1990). What Washington Means by Policy Reform", Peterson Institute for International Economics Speeches, Testimony, Papers, In J. Williamson (Eds.*), Latin American Adjustment: How Much Has Happened?* Washington DC: Peterson Institute for International Economics.

[183]. Williamson, J. (2000). What should the World Bank think about the Washington Consensus? *The World Bank Research Observer*, *15*(2), 251-264.

[184]. Wooldridge, Jeffrey M. (2013). *"Fixed Effects Estimation". Introductory Econometrics: A Modern Approach* (Fifth international ed.). Mason, OH: South-Western. pp. 466–474. ISBN 978-1-111-53439-4.

[185]. World Bank (2003), *Global Economic Prospects and the Developing Countries* (GEP) Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/867491468124755492/Global-economic-prospects-and-the-developing-countries-2003-investing-to-unlock-global-opportunities

[186]. World Bank (2005). *Economic Growth in the 1990s: Learning from a Decade of Reform*. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/7370 License: CC BY 3.0 IGO."

[187]. World Bank (2019c*). China Imports and Exports Goods and Services*, https://data.worldbank.org/ (Accessed on 12 November 2019)

[188]. World Bank (2019a). *GDP Per Capita* , https://data.worldbank.org/ (Accessed on 11 February 2020)

[189]. World Bank (2019e). *Growth Rate* , https://data.worldbank.org/ (Accessed on 11 February 2020)

[190]. World Bank (2019f). *High-tech exports (% manufactured exports),* https://data.worldbank.org/ (Accessed on 2 February 2020)

[191]. World Bank (2019). *Medium and high-tech exports (% manufactured exports),* https://data.worldbank.org/ (Accessed on 2 February 2020)

[192]. World Bank (2019b). *Trade (% of GDP),* https://data.worldbank.org/ (Accessed on 9 February 2020)

[193]. World Bank (2019d*). Turkey Imports and Exports Goods and Services,* https://data.worldbank.org/ (Accessed on 12 November 2019)

[194]. World Bank, World Development Indicators, (2019). *GDP*, Retrieved from https://data.worldbank.org/indicator/NY.GDP.MKTP.KD

[195]. World Bank, World Development Indicators, (2019). *Imports of Goods and Services*, Retrieved from https://data.worldbank.org/indicator/ NE.IMP.GNFS.CD

[196]. World Bank, World Development Indicators, (2019). *Exports of Goods and Services*, Retrieved from https://data.worldbank.org/indicator/NE.EXP.GNFS.CD

[197]. Xu, Z. (1996). On the causality between export growth and GDP growth: an empirical reinvestigation. *Review of International Economics*, *4*(2), 172-184.

[198]. Yang, Q. (1998). The Effect of China's Export on Economic Growth. *World Economic and Polity*, 8: 123.

[199]. Yao, Y. (2011). Beijing Consensus or Washington Consensus: What Explains China's Economic Success? *Development Outreach*, *13*(1), 26-31.

[200]. Yapraklı, S. (2007). Ticari ve finansal dışa açıklık ile ekonomik büyüme arasındaki ilişki: Türkiye üzerine bir uygulama. *İstanbul Üniversitesi İktisat Fakültesi Ekonometri ve İstatistik Dergisi, 5*(1): 67-89.

[201]. Yeldan, E. (2003). *Küreselleşmenin neresindeyiz? Türkiye ekonomisinde borç sorunu ve IMF politikaları*.

[202]. Yu, L. & San, M. G. (2016). Research on the Relationship between China's Foreign Trade and Economic Growth Based on VAR. *International Journal of Business and Social Science*, *7*(4), 253-259.

[203]. Yuan, L., & Tsai, T. (2000). Foreign Direct Investment Policy in China. China Review, 223-247.

[204]. Yücel, F. (2009). Causal relationships between financial development, trade openness and economic growth: The case of Turkey. *Journal of Social Sciences, 5*(1): 33-42.

[205]. Yüksel, S., & Zengin, S. (2016). Causality Relationship Between Import, Export and Growth Rate in Developing Countries. *International Journal of Commerce and Finance,* 2(1), 147-156.

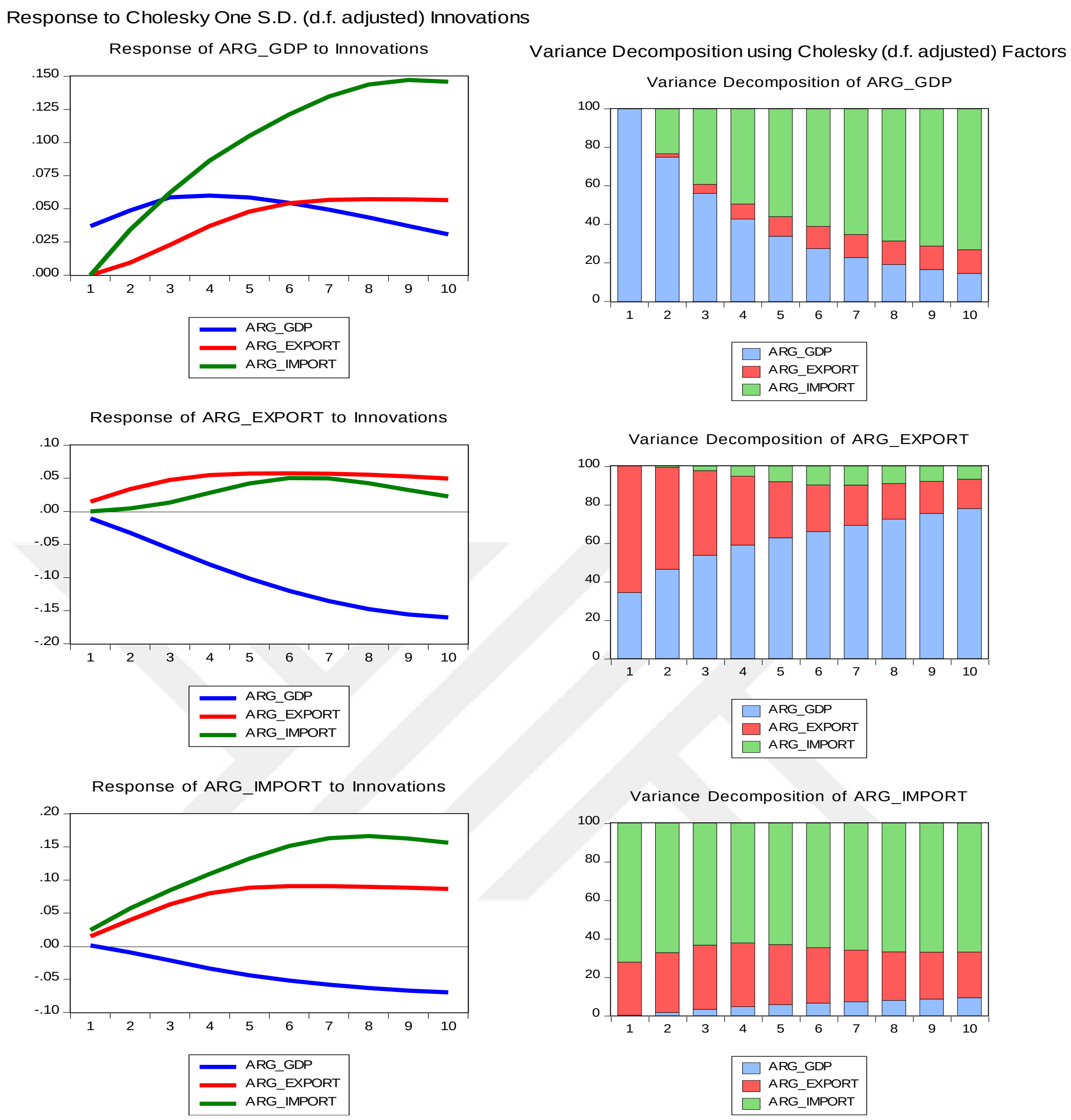
[206]. Zhang, W. (2012). *The China wave: Rise of a civilizational state*. NJ: World Century Publishing Corporation.

Appendix: Econometric Findings of Countries in Chapter 4

1. **ARGENTINA**

Vector Error Correction Test (Argentina)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.202388	0.137661	-1.470199	0.1454
C(2)	0.252821	0.184392	1.371103	0.1741
C(3)	0.477428	0.176246	2.708872	0.0082**
C(4)	-0.691527	0.367508	-1.881667	0.0635*
C(5)	0.369210	0.326493	1.130837	0.2615
C(6)	1.229890	0.265812	4.626908	0.0000**
C(7)	-0.882135	0.291178	-3.029542	0.0033**
C(8)	0.005660	0.011872	0.476745	0.6348
C(9)	-0.226221	0.067461	-3.353372	0.0012**
C(10)	-0.057261	0.090362	-0.633681	0.5281
C(11)	0.095178	0.086370	1.101979	0.2737
C(12)	1.217648	0.180098	6.761038	0.0000**
C(13)	-0.778430	0.159999	-4.865229	0.0000**
C(14)	-0.027786	0.130262	-0.213309	0.8316
C(15)	0.139340	0.142692	0.976508	0.3317
C(16)	0.019444	0.005818	3.342128	0.0013**
C(17)	-0.086833	0.106129	-0.818187	0.4157
C(18)	-0.157428	0.142156	-1.107428	0.2714
C(19)	0.285928	0.135876	2.104325	0.0385**
C(20)	0.325310	0.283328	1.148172	0.2543
C(21)	-0.361435	0.251708	-1.435928	0.1549
C(22)	1.289040	0.204927	6.290247	0.0000**
C(23)	-0.527889	0.224482	-2.351587	0.0211**
C(24)	0.011795	0.009152	1.288742	0.2012
	D(GDP)	**D(Exports)**	**D(Imports)**	
R-square	0.766957	0.926259	0.873520	
Akaike AIC	-3.565755	-4.992243	-4.086031	
Schwarz SC	-3.210247	-4.636735	-3.730523	



IRFs (Left) and Variance Decomposition (Right) for Argentina

Model Diagnostics (Argentina)

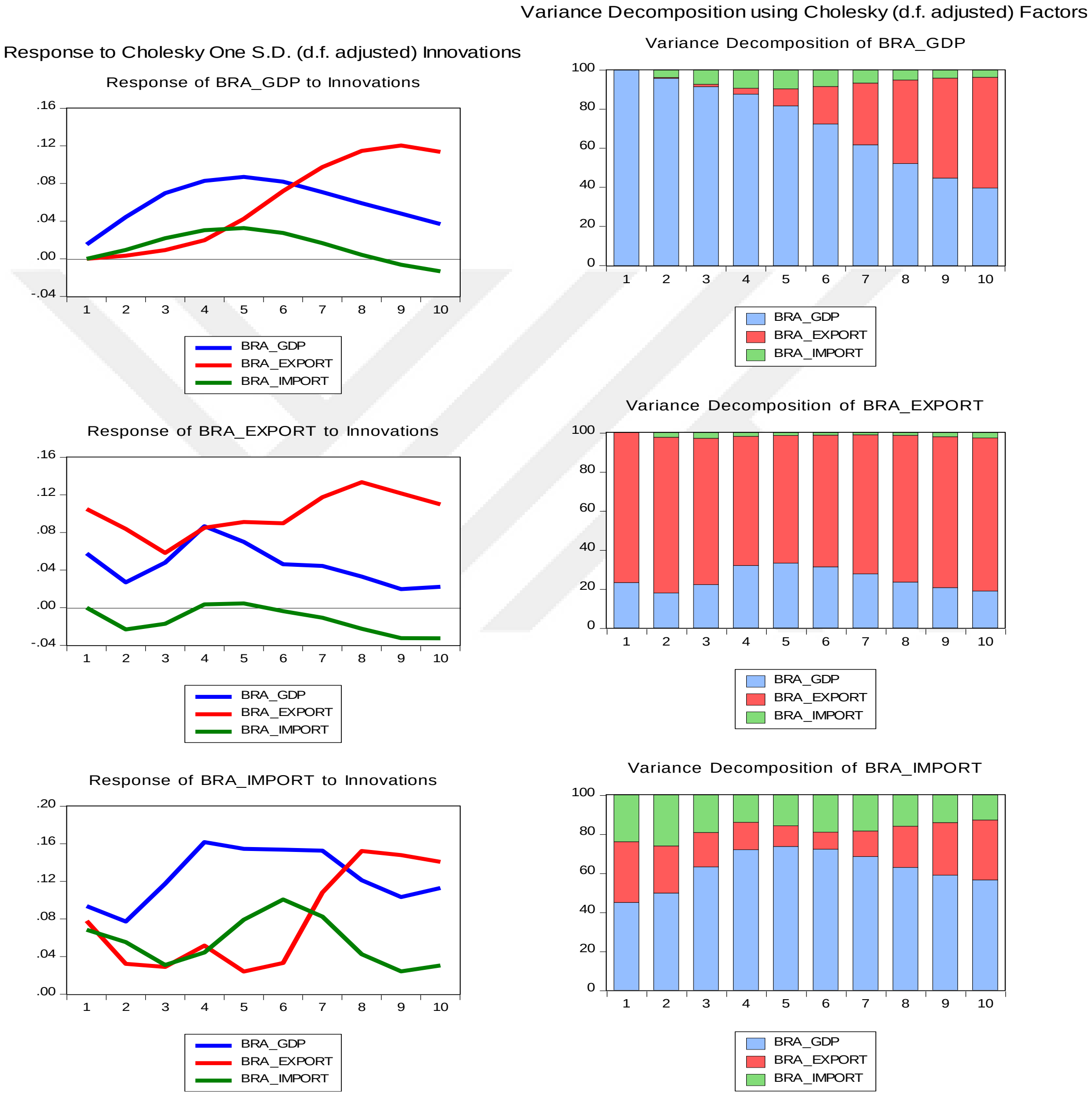
Model Diagnostics	
Autocorrelation Test	VEC Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2 and lag 3 have p-values of 0.9498, 0.2823 and 0.0939, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%
Heteroscedasticity Test	VEC Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 87.17791 and a p-value of 0.3846 which it makes sure of VEC models reliability.
Normality Test	VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque- Bera joint test result shows that p-value is 0.0985 and higher than 0.05% significance level which indicates sample data is normally distributed.
Stability Test	Inverse roots of AR characteristic polynomial shows that all roots are within the unit circle. It means that this model is stable.

2. BRAZIL

Vector Error Correction Test (Brazil)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.282451	0.052156	-5.415455	0.0000
C(2)	1.629653	0.138725	11.74735	0.0000
C(3)	-0.859206	0.233593	-3.678218	0.0005
C(4)	0.349628	0.137486	2.542997	0.0132
C(5)	-0.210443	0.057365	-3.668521	0.0005
C(6)	-0.081657	0.032849	-2.485858	0.0154
C(7)	-0.162377	0.045303	-3.584225	0.0006
C(8)	0.071049	0.027854	2.550804	0.0130
C(9)	-0.065152	0.023660	-2.753628	0.0075
C(10)	0.045591	0.026870	1.696733	0.0943
C(11)	0.013623	0.003902	3.490825	0.0008
C(12)	0.176190	0.411247	0.428428	0.6697
C(13)	-0.303879	1.093830	-0.277812	0.7820
C(14)	2.423974	1.841851	1.316053	0.1925
C(15)	-1.873309	1.084064	-1.728042	0.0885
C(16)	0.137285	0.452312	0.303519	0.7624
C(17)	-0.332584	0.259007	-1.284072	0.2034
C(18)	0.423117	0.357210	1.184504	0.2403
C(19)	-0.297602	0.219622	-1.355066	0.1798
C(20)	0.098407	0.186558	0.527487	0.5995
C(21)	-0.246846	0.211864	-1.165119	0.2480
C(22)	0.046733	0.030770	1.518783	0.1334
C(23)	0.765805	0.479958	1.595564	0.1152
C(24)	0.434547	1.276588	0.340397	0.7346
C(25)	1.777251	2.149588	0.826787	0.4112
C(26)	-1.604683	1.265189	-1.268335	0.2089
C(27)	0.087424	0.527884	0.165611	0.8689
C(28)	0.656220	0.302282	2.170885	0.0334
C(29)	0.472159	0.416893	1.132567	0.2613
C(30)	-0.012808	0.256316	-0.049970	0.9603
C(31)	-0.479406	0.217728	-2.201855	0.0310
C(32)	-0.264997	0.247262	-1.071728	0.2876

C(33)	0.009798	0.035911	0.272829	0.7858
	D(GDP)	**D(Exports)**	**D(Imports)**	
R-square	0.979493	0.475342	0.607093	
Akaike AIC	-5.279322	-1.149429	-0.840420	
Schwarz SC	-4.785500	-0.655607	-0.346597	



IRFs (Left) and Variance Decomposition (Right) for Brazil

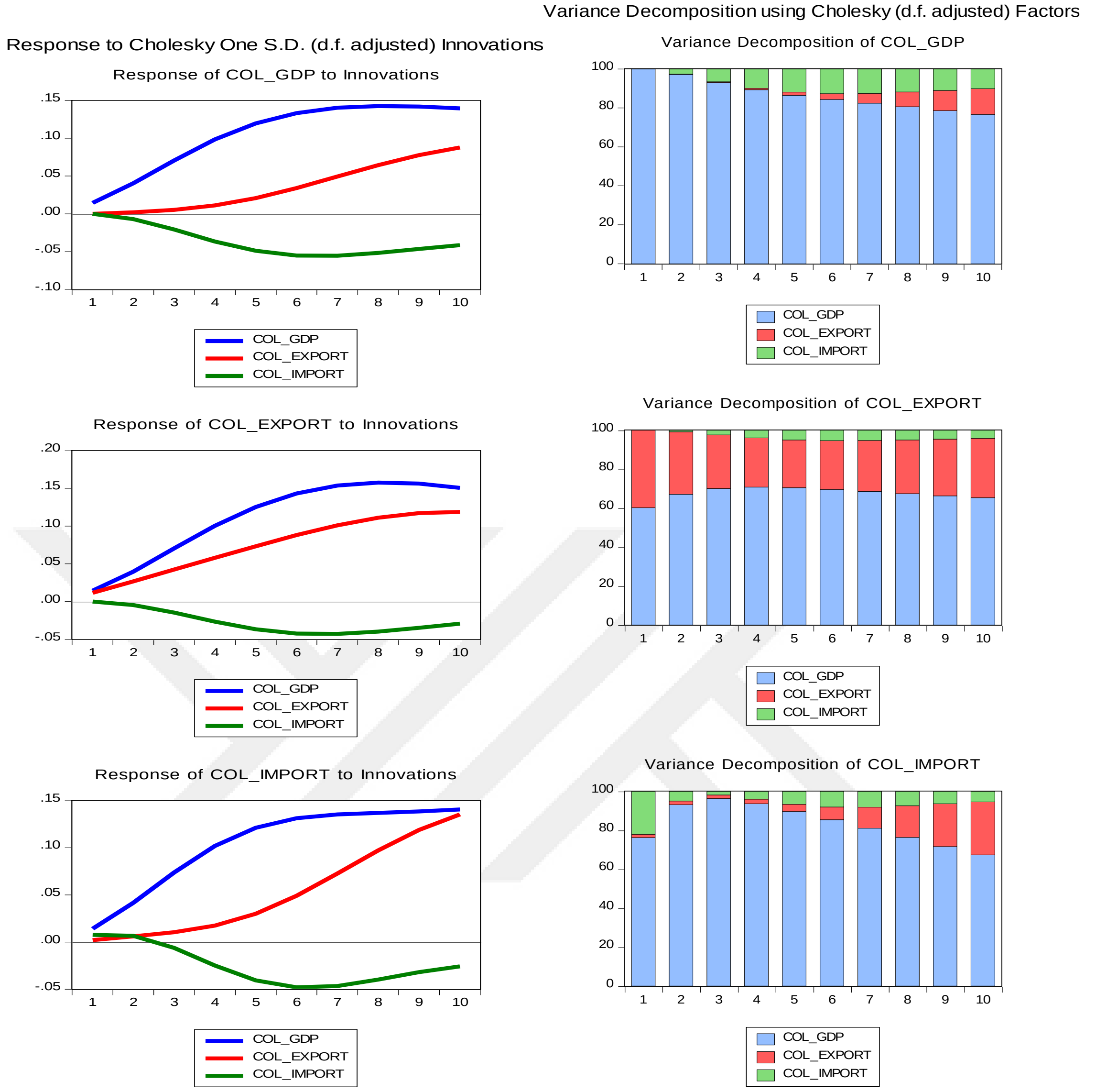
Model Diagnostics (Brazil)

Model Diagnostics	
Autocorrelation Test	VEC Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2, lag 3 and lag 4 have p-values of 0.5480, 0.2650, 0.6482 and 0.5368, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%.
Heteroscedasticity Test	VEC Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 126.6950 and a p-value of 0.3202 which it makes sure of VEC models reliability.
Normality Test	VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque-Bera joint test result shows that p-value is 0.8563 and higher than 0.05% significance level which indicates sample data is normally distributed.
Stability Test	Inverse roots of AR characteristic polynomial shows that all roots are within the unit circle. It means that this model is stable.

3. COLOMBIA

Vector Error Correction Test (Colombia)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.029789	0.010191	-2.923176	0.0045**
C(2)	2.402457	0.348356	6.896553	0.0000**
C(3)	-1.133420	0.355830	-3.185287	0.0021**
C(4)	0.177801	0.208500	0.852762	0.3963
C(5)	-0.434675	0.285762	-1.521111	0.1321
C(6)	-0.818529	0.248704	-3.291180	0.0015**
C(7)	0.585211	0.212097	2.759161	0.0072**
C(8)	0.014478	0.004731	3.060494	0.0030**
C(9)	-0.007905	0.012987	-0.608705	0.5444
C(10)	0.965644	0.443948	2.175130	0.0325**
C(11)	-0.766687	0.453472	-1.690704	0.0947*
C(12)	1.365026	0.265713	5.137212	0.0000**
C(13)	-0.531277	0.364177	-1.458842	0.1485
C(14)	-0.580770	0.316950	-1.832373	0.0706*
C(15)	0.396220	0.270299	1.465861	0.1466
C(16)	0.008272	0.006029	1.372097	0.1738
C(17)	-0.053492	0.011432	-4.679265	0.0000**
C(18)	1.705893	0.390788	4.365271	0.0000**
C(19)	-0.803986	0.399171	-2.014138	0.0473**
C(20)	0.094869	0.233896	0.405603	0.6861
C(21)	-0.594989	0.320569	-1.856042	0.0671*
C(22)	0.068805	0.278997	0.246615	0.8058
C(23)	0.244232	0.237932	1.026478	0.3077
C(24)	0.024890	0.005307	4.690069	0.0000**
	D(GDP)	**D(EXPORT)**	**D(IMPORT)**	
R-squared	0.965467	0.938039	0.973346	
Akaike AIC	-5.432609	-4.947646	-5.202732	
Schwarz SC	-5.077101	-4.592138	-4.847224	



IRFs (Left) and Variance Decomposition (Right) for Colombia

Model Diagnostics (Colombia)

Model Diagnostics	
Autocorrelation Test	VEC Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2, and lag 3 have p-values of 0.6692, 0.2102, 0.7070, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%
Heteroscedasticity Test	VEC Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 78.36686 and a p-value of 0.6528 which it makes sure of VEC models reliability.
Normality Test	VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque-Bera joint test result shows that p-value is 0.6351and higher than 0.05% significance level which indicates sample data is normally distributed.
Stability Test	Inverse roots of AR characteristic polynomial shows that all roots are within the unit circle. It means that this model is stable.

4. DOMINICAN REPUBLIC

Vector Error Correction Test (Dominican R.)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.047539	0.048612	0.977919	0.3315
C(2)	0.833209	0.311271	2.676793	0.0093
C(3)	0.165603	0.285866	0.579302	0.5643
C(4)	0.190649	0.274175	0.695357	0.4892
C(5)	0.098712	0.322670	0.305922	0.7606
C(6)	0.530388	0.305999	1.733301	0.0875
C(7)	0.008286	0.292352	0.028344	0.9775
C(8)	-1.173648	0.396124	-2.962830	0.0042
C(9)	-0.480721	0.431805	-1.113282	0.2695
C(10)	-0.033495	0.351650	-0.095250	0.9244
C(11)	0.048488	0.029880	1.622726	0.1092
C(12)	0.202004	0.040516	4.985754	0.0000
C(13)	0.893281	0.259433	3.443207	0.0010
C(14)	0.937579	0.238259	3.935129	0.0002
C(15)	0.263174	0.228514	1.151677	0.2534
C(16)	0.145405	0.268933	0.540673	0.5905
C(17)	0.350513	0.255038	1.374355	0.1738
C(18)	0.221340	0.243665	0.908379	0.3668
C(19)	-1.449541	0.330154	-4.390497	0.0000
C(20)	-1.065762	0.359893	-2.961327	0.0042
C(21)	-0.371828	0.293087	-1.268664	0.2088
C(22)	0.078547	0.024904	3.153982	0.0024
C(23)	0.196043	0.041849	4.684565	0.0000
C(24)	1.079756	0.267964	4.029480	0.0001
C(25)	0.462006	0.246094	1.877360	0.0647
C(26)	0.663191	0.236029	2.809791	0.0064
C(27)	0.092315	0.277777	0.332335	0.7406
C(28)	0.285854	0.263425	1.085144	0.2816
C(29)	0.072139	0.251677	0.286632	0.7753
C(30)	-1.401876	0.341011	-4.110938	0.0001

C(31)	-0.736721	0.371728	-1.981881	0.0515
C(32)	-0.542811	0.302725	-1.793084	0.0773
C(33)	0.073643	0.025723	2.862902	0.0056

	D(GDP)	**D(Exports)**	**D(Imports)**
R-square	0.57719	0.797449	0.746043
Akaike AIC	-0.853482	-1.217817	-1.153106
Schwarz SC	-0.359659	-0.723994	-0.659284

Impulse Response Functions (Left) and Variance Decomposition (Right) for Dominican Republic

Model Diagnostics (Dominican Republic)

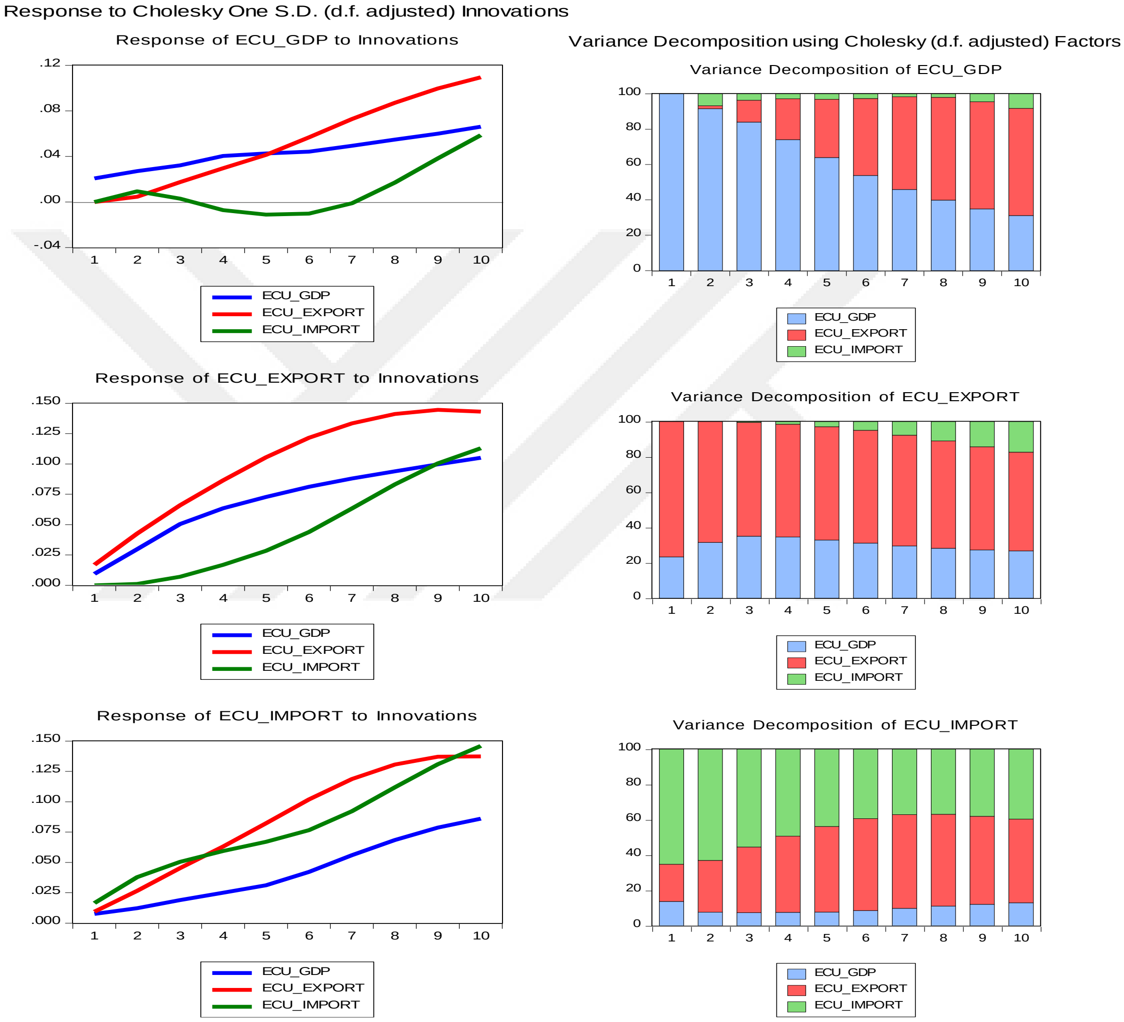
Model Diagnostics	
Autocorrelation Test	VEC Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2, lag 3 and lag 4 have p-values of 0.2516, 0.7354, 0.3599, 0.2356, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%
Heteroscedasticity Test	VEC Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 124.9388 and a p-value of 0.3604 which it makes sure of VEC models reliability.
Normality Test	VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque-Bera joint test result shows that p-value is 0.2139 and higher than 0.05% significance level which indicates sample data is normally distributed.
Stability Test	Inverse roots of AR characteristic polynomial shows that all roots are within the unit circle. It means that this model is stable.

5. ECUADOR

Vector Error Correction Test (Ecuador)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.363636	0.137312	-2.648257	0.0100**
C(2)	0.487775	0.182403	2.674166	0.0093**
C(3)	0.522487	0.215802	2.421142	0.0181**
C(4)	-0.048151	0.219179	-0.219689	0.8268
C(5)	-0.354124	0.255934	-1.383652	0.1709
C(6)	0.557749	0.393598	1.417053	0.1610
C(7)	-0.646236	0.308512	-2.094686	0.0399**
C(8)	0.593978	0.253579	2.342377	0.0221**
C(9)	-1.138839	0.394034	-2.890203	0.0051**
C(10)	0.412935	0.318974	1.294572	0.1998
C(11)	0.024595	0.008600	2.860021	0.0056**
C(12)	0.172941	0.128410	1.346780	0.1825
C(13)	0.119259	0.170579	0.699143	0.4868
C(14)	-0.276669	0.201813	-1.370920	0.1748
C(15)	-0.313539	0.204971	-1.529673	0.1307
C(16)	1.631464	0.239344	6.816409	0.0000**
C(17)	-0.877097	0.368083	-2.382877	0.0199**
C(18)	0.459194	0.288513	1.591586	0.1160
C(19)	0.053891	0.237141	0.227252	0.8209
C(20)	-0.015897	0.368492	-0.043140	0.9657
C(21)	0.238681	0.298297	0.800145	0.4264
C(22)	-0.006303	0.008042	-0.783703	0.4359
C(23)	-0.038372	0.136155	-0.281825	0.7789
C(24)	-0.344908	0.180866	-1.906979	0.0607*
C(25)	0.229275	0.213984	1.071458	0.2877
C(26)	-0.236913	0.217333	-1.090091	0.2795
C(27)	0.264635	0.253778	1.042781	0.3007
C(28)	-0.184178	0.390282	-0.471909	0.6385
C(29)	0.282245	0.305913	0.922631	0.3594
C(30)	1.290834	0.251443	5.133704	0.0000**
C(31)	-0.695428	0.390715	-1.779883	0.0795*

C(32)	0.114034	0.316287	0.360538	0.7195
C(33)	0.006563	0.008527	0.769692	0.4441
	D(GDP)	**D(Exports)**	**D(Imports)**	
R-square	0.898763	0.948767	0.933384	
Akaike AIC	-4.666000	-4.800040	-4.682918	
Schwarz SC	-4.172178	-4.306218	-4.189095	



IRFs (Left) and Variance Decomposition (Right) for Ecuador

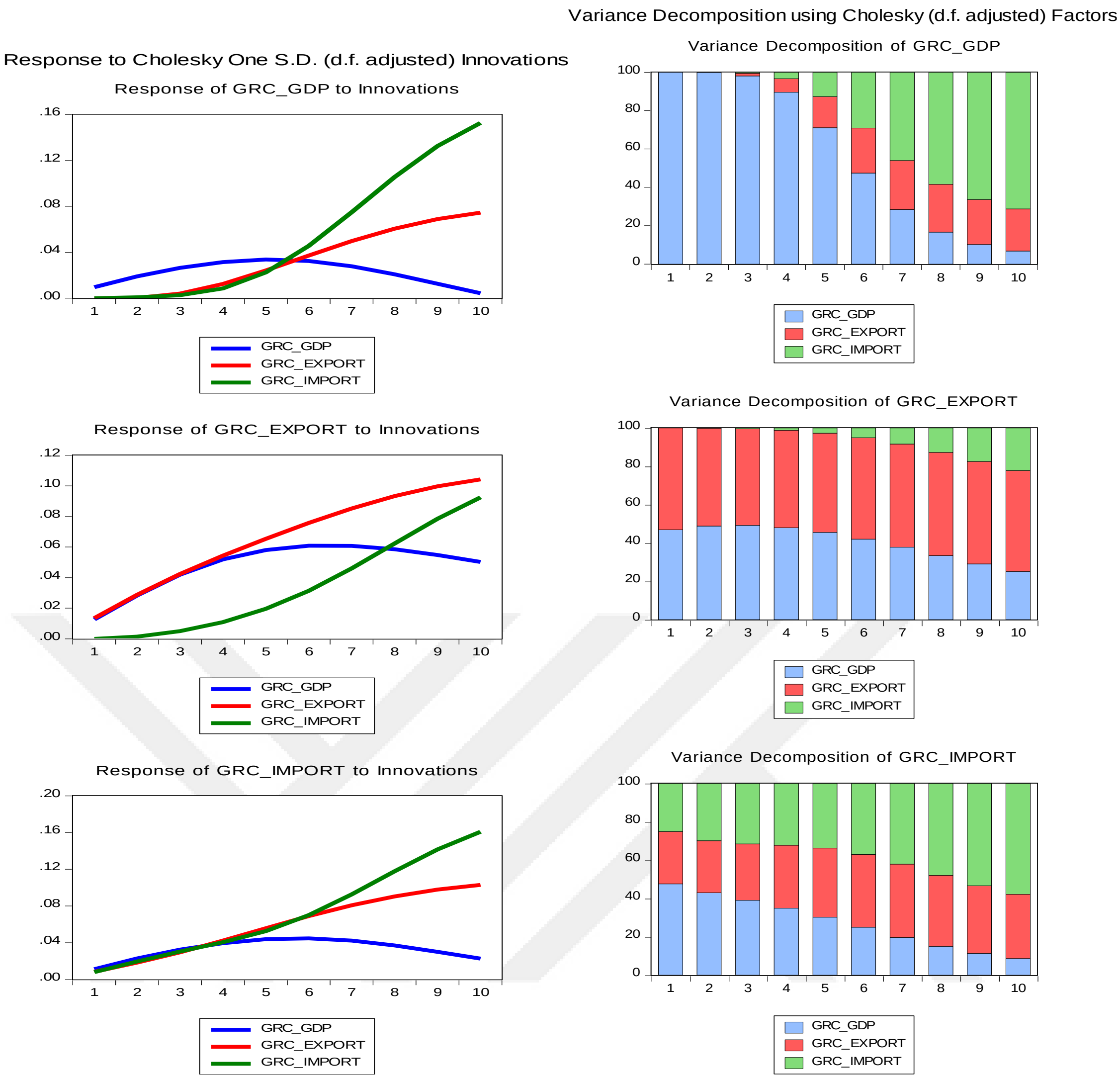
Model Diagnostics (Ecuador)

Model Diagnostics	
Autocorrelation Test	VEC Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2, lag 3 and lag 4 have p-values of 0.9296, 0.4923, 0.4130, 0.3519, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%
Heteroscedasticity Test	VEC Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 110.9626 and a p-value of 0.7107 which it makes sure of VEC models reliability.
Normality Test	VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque-Bera joint test result shows that p-value is 0.7722 and higher than 0.05% significance level which indicates sample data is normally distributed.
Stability Test	Inverse roots of AR characteristic polynomial shows that all roots are within the unit circle. It means that this model is stable.

6. GREECE

Vector Error Correction Test (Greece)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.316464	0.066350	-4.769602	0.0000
C(2)	1.261423	0.166943	7.555987	0.0000
C(3)	-0.221924	0.227046	-0.977442	0.3313
C(4)	0.156335	0.155969	1.002348	0.3192
C(5)	0.418138	0.185260	2.257032	0.0267
C(6)	-0.322703	0.184565	-1.748455	0.0842
C(7)	-0.393750	0.268482	-1.466577	0.1464
C(8)	-0.001243	0.001989	-0.625003	0.5337
C(9)	-0.068682	0.128714	-0.533600	0.5951
C(10)	0.152083	0.323856	0.469600	0.6399
C(11)	-0.111507	0.440450	-0.253167	0.8008
C(12)	1.069783	0.302566	3.535704	0.0007
C(13)	-0.248787	0.359389	-0.692249	0.4908
C(14)	0.084432	0.358040	0.235818	0.8142
C(15)	-0.084171	0.520833	-0.161609	0.8720
C(16)	0.005358	0.003859	1.388299	0.1689
C(17)	-0.259416	0.111547	-2.325622	0.0225
C(18)	0.036912	0.280663	0.131517	0.8957
C(19)	0.259065	0.381706	0.678703	0.4993
C(20)	-0.000141	0.262212	-0.000539	0.9996
C(21)	0.531323	0.311457	1.705929	0.0919
C(22)	1.108491	0.310287	3.572464	0.0006
C(23)	-1.026728	0.451369	-2.274700	0.0256
C(24)	0.001002	0.003344	0.299502	0.7653
	D(GDP)	**D(EXPORT)**	**D(IMPORT)**	
R-squared	0.983444	0.906486	0.949757	
Akaike AIC	-6.274851	-4.949562	-5.235852	
Schwarz SC	-5.919343	-4.594054	-4.880344	



Impulse Response Functions (Left) and Variance Decomposition (Right) for Greece

Model Diagnostics (Greece)

Model Diagnostics	
Autocorrelation Test	VEC Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2, and lag 3 have p-values of 0.5787, 0.1848, 0.2801, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%
Heteroscedasticity Test	VEC Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 107.4057 and a p-value of 0.435 which it makes sure of VEC models reliability.
Normality Test	VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque-Bera joint test result shows that p-value is 0.1435 and higher than 0.05% significance level which indicates sample data is normally distributed.
Stability Test	Inverse roots of AR characteristic polynomial shows that all roots are within the unit circle. It means that this model is stable.

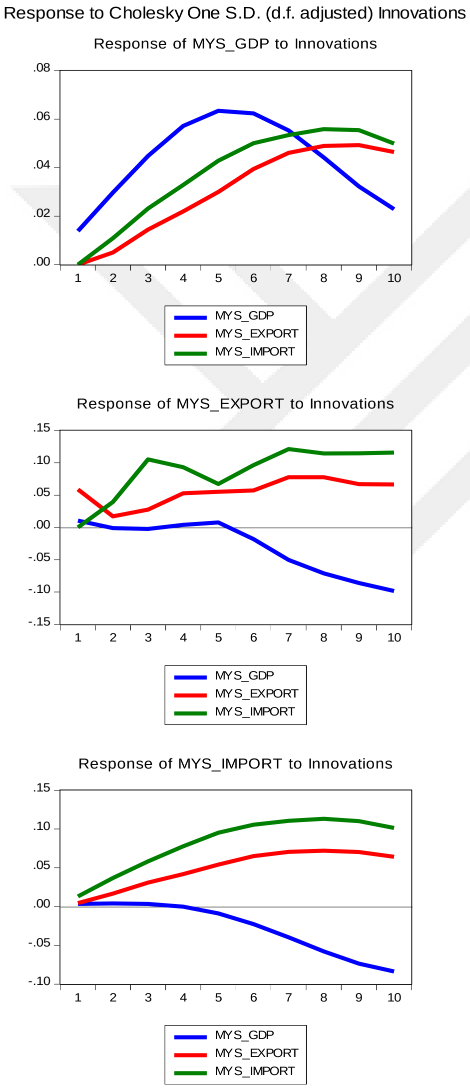
7. MALAYSIA

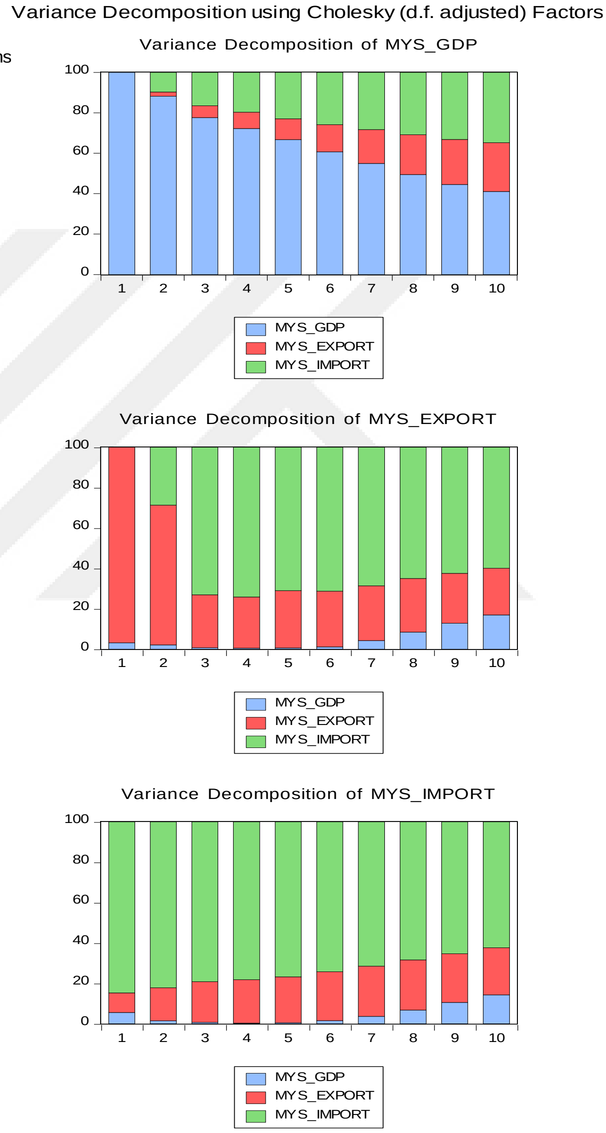
Vector Error Correction Test (Malaysia)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.013940	0.011730	1.188447	0.2387
C(2)	0.922525	0.196217	4.701548	0.0000
C(3)	0.307576	0.285622	1.076862	0.2853
C(4)	-0.572171	0.198514	-2.882278	0.0053
C(5)	-0.042356	0.043230	-0.979785	0.3306
C(6)	-0.037779	0.035949	-1.050891	0.2970
C(7)	-0.042934	0.030439	-1.410495	0.1629
C(8)	0.928120	0.179467	5.171532	0.0000
C(9)	-1.394337	0.340401	-4.096162	0.0001
C(10)	0.794398	0.267880	2.965498	0.0041
C(11)	0.006140	0.004111	1.493506	0.1399
C(12)	-0.281604	0.050724	-5.551714	0.0000
C(13)	-0.583197	0.848534	-0.687299	0.4942
C(14)	0.510333	1.235163	0.413171	0.6808
C(15)	1.854447	0.858465	2.160191	0.0342
C(16)	0.374990	0.186948	2.005857	0.0488
C(17)	0.028164	0.155461	0.181164	0.8568
C(18)	-0.084550	0.131631	-0.642325	0.5228
C(19)	1.398265	0.776099	1.801659	0.0760
C(20)	1.392505	1.472051	0.945962	0.3475
C(21)	-4.004418	1.158439	-3.456738	0.0009
C(22)	0.016418	0.017779	0.923480	0.3590
C(23)	0.026780	0.011906	2.249230	0.0277
C(24)	-0.477479	0.199176	-2.397267	0.0192
C(25)	0.768500	0.289930	2.650641	0.0100
C(26)	-0.702260	0.201507	-3.485031	0.0009
C(27)	-0.050241	0.043882	-1.144911	0.2562
C(28)	-0.066987	0.036491	-1.835700	0.0707
C(29)	-0.051992	0.030898	-1.682712	0.0970
C(30)	2.007560	0.182174	11.02003	0.0000
C(31)	-1.442458	0.345535	-4.174569	0.0001

C(32)	0.746037	0.271920	2.743588	0.0077
C(33)	0.013315	0.004173	3.190589	0.0021

	D(GDP)	**D(Exports)**	**D(Imports)**
R-square	0.948450	0.819599	0.970181
Akaike AIC	-5.474583	-2.546006	-5.444645
Schwarz SC	-4.980760	-2.052184	-4.950823





IRFs (Left) and Variance Decomposition (Right) for Malaysia

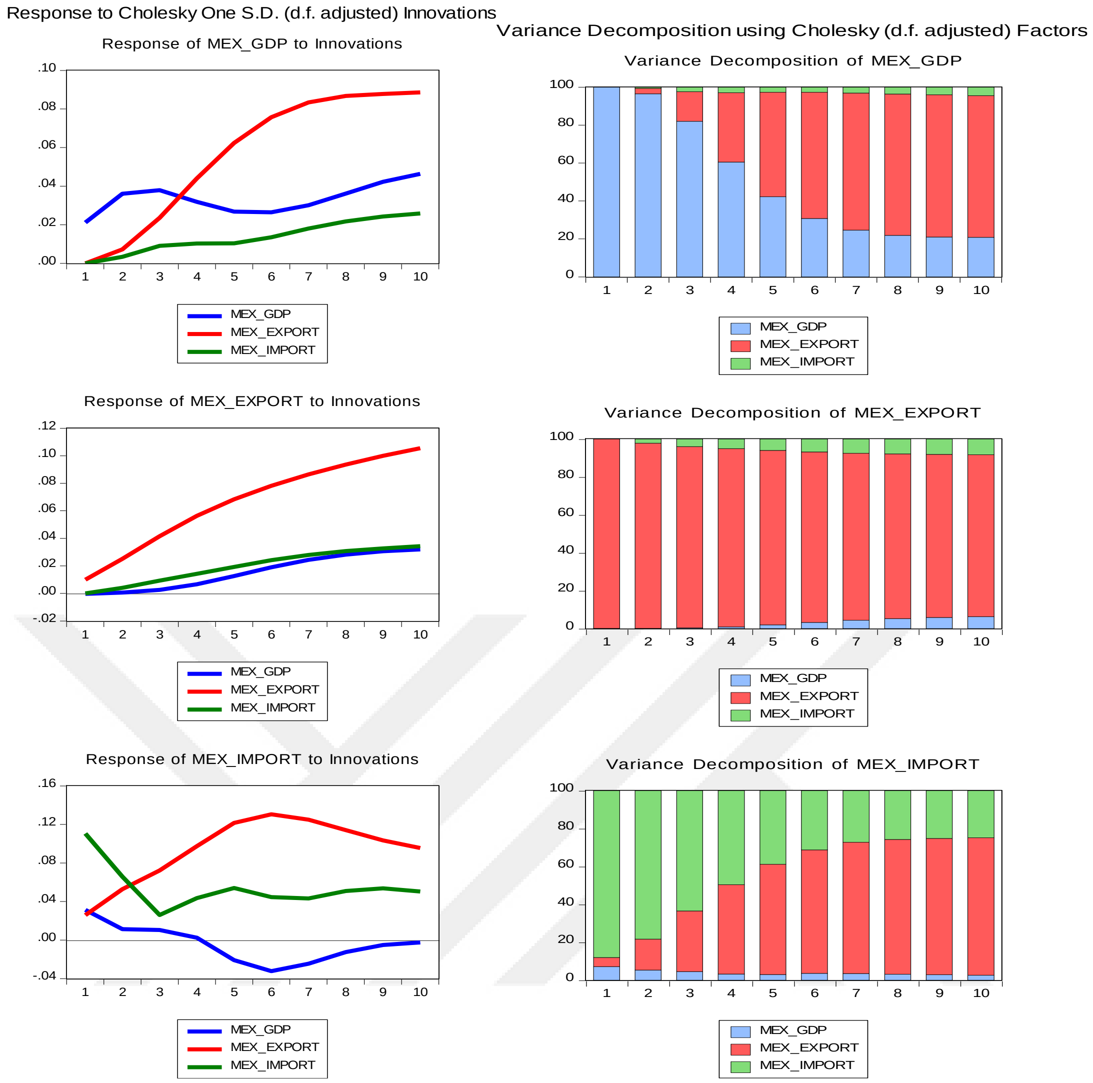
Model Diagnostics (Malaysia)

Model Diagnostics	
Autocorrelation Test	VEC Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2, lag 3 and lag 4 have p-values of 0.7647, 0.4264, 0.6001, 0.7659 respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%.
Heteroscedasticity Test	VEC Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 116.5292 and a p-value of 0.5726 which it makes sure of VEC models reliability.
Normality Test	VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque-Bera joint test result shows that p-value is 0.2316 and higher than 0.05% significance level which indicates sample data is normally distributed.
Stability Test	Inverse roots of AR characteristic polynomial shows that all roots are within the unit circle. It means that this model is stable.

8. MEXICO

Vector Error Correction Test (Mexico)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.066347	0.048988	-1.354351	0.1794
C(2)	0.736894	0.151676	4.858328	0.0000**
C(3)	-0.343312	0.147172	-2.332733	0.0221**
C(4)	0.568567	0.311099	1.827610	0.0713*
C(5)	-0.026533	0.346352	-0.076606	0.9391
C(6)	0.054987	0.021873	2.513877	0.0139**
C(7)	0.043847	0.022773	1.925383	0.0577*
C(8)	-0.018508	0.008196	-2.258067	0.0266**
C(9)	0.043526	0.023147	1.880436	0.0636*
C(10)	-0.037281	0.071667	-0.520197	0.6043
C(11)	-0.001829	0.069538	-0.026296	0.9791
C(12)	1.477949	0.146993	10.05455	0.0000**
C(13)	-0.616409	0.163650	-3.766626	0.0003**
C(14)	0.020990	0.010335	2.030952	0.0455**
C(15)	-0.006070	0.010760	-0.564107	0.5742
C(16)	0.008097	0.003873	2.090801	0.0397**
C(17)	-1.110705	0.273493	-4.061184	0.0001**
C(18)	0.818623	0.846782	0.966746	0.3365
C(19)	1.697641	0.821632	2.066182	0.0420**
C(20)	2.550395	1.736809	1.468437	0.1459
C(21)	-1.994220	1.933621	-1.031340	0.3055
C(22)	0.000660	0.122114	0.005406	0.9957
C(23)	-0.247652	0.127138	-1.947898	0.0549*
C(24)	-0.015612	0.045759	-0.341184	0.7338
	D(GDP)	**D(EXPORT)**	**D(IMPORT)**	
R-squared	0.858728	0.940132	0.510194	
Akaike AIC	-4.682232	-6.181683	-1.242844	
Schwarz SC	-4.326724	5.826175	0.887336	



IRFs (Left) and Variance Decomposition (Right) for Mexico

Model Diagnostics (Mexico)

Model Diagnostics	
Autocorrelation Test	VEC Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2, and lag 3 have p-values of 0.1297, 0.3045, 0.0675, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%
Heteroscedasticity Test	VEC Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 97.81473 and a p-value of 0.1438 which it makes sure of VEC models reliability.
Normality Test	VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque-Bera joint test result shows that p-value is 0.3437 and higher than 0.05% significance level which indicates sample data is normally distributed.
Stability Test	Inverse roots of AR characteristic polynomial shows that all roots are within the unit circle. It means that this model is stable.

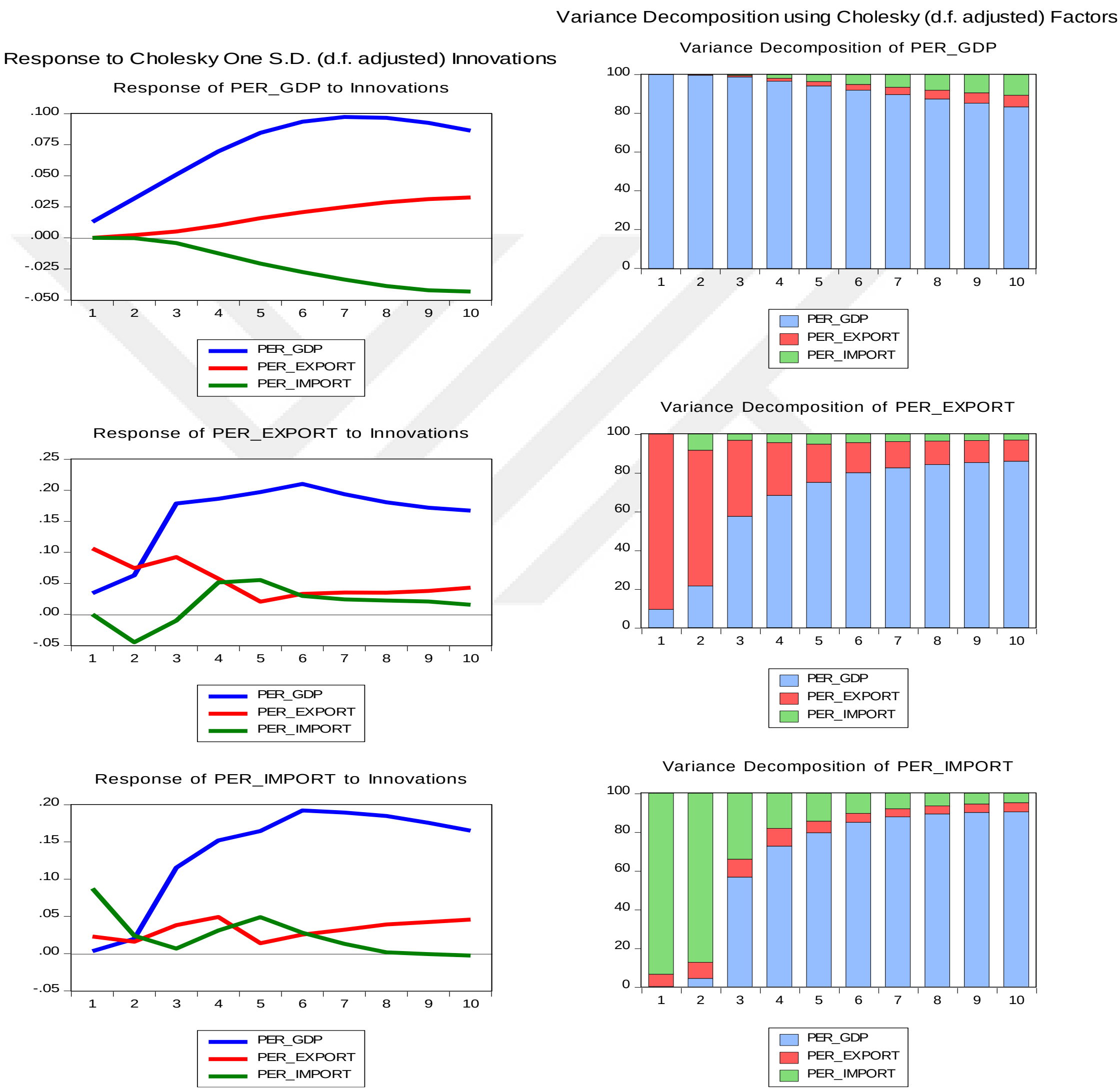
9. PERU

Vector Error Correction Test (Peru)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.003953	0.002693	1.467455	0.1468
C(2)	1.403089	0.198526	7.067537	0.0000**
C(3)	-0.644362	0.327412	-1.968043	0.0531*
C(4)	0.075384	0.190410	0.395902	0.6934
C(5)	-0.011197	0.021679	-0.516505	0.6072
C(6)	-0.020638	0.023583	-0.875128	0.3845
C(7)	1.65E-05	0.020554	0.000801	0.9994
C(8)	0.038462	0.031922	1.204870	0.2324
C(9)	0.006955	0.032689	0.212745	0.8322
C(10)	-0.018435	0.025866	-0.712709	0.4784
C(11)	0.009098	0.003503	2.597333	0.0115**
C(12)	-0.108349	0.023299	-4.650315	0.0000**
C(13)	2.979455	1.717324	1.734941	0.0872*
C(14)	5.892890	2.832241	2.080646	0.0412**
C(15)	-5.250823	1.647119	-3.187882	0.0022**
C(16)	0.695114	0.187531	3.706664	0.0004**
C(17)	0.916199	0.204000	4.491164	0.0000**
C(18)	0.334127	0.177798	1.879252	0.0644*
C(19)	-1.625852	0.276140	-5.887779	0.0000**
C(20)	-1.174123	0.282776	-4.152130	0.0001**
C(21)	-0.320586	0.223748	-1.432796	0.1564
C(22)	-0.077151	0.030302	-2.546042	0.0131**
C(23)	-0.041465	0.018894	-2.194664	0.0316**
C(24)	1.277493	1.392596	0.917347	0.3622
C(25)	5.721705	2.296694	2.491279	0.0151**
C(26)	-2.952445	1.335666	-2.210466	0.0304**
C(27)	0.429097	0.152071	2.821695	0.0062**
C(28)	0.648263	0.165426	3.918751	0.0002**
C(29)	0.509687	0.144178	3.535118	0.0007**
C(30)	-1.149716	0.223925	-5.134384	0.0000**
C(31)	-1.100049	0.229306	-4.797296	0.0000**

C(32)	-0.587621	0.181440	-3.238658	0.0018**
C(33)	-0.080630	0.024572	-3.281330	0.0016**

	D(GDP)	D(Exports)	D(Imports)
R-square	0.958910	0.725100	0.779126
Akaike AIC	-5.606684	-1.291479	-1.710674
Schwarz SC	5.112862	-0.797656	-1.216852



IRFs (Left) and Variance Decomposition (Right) for Peru

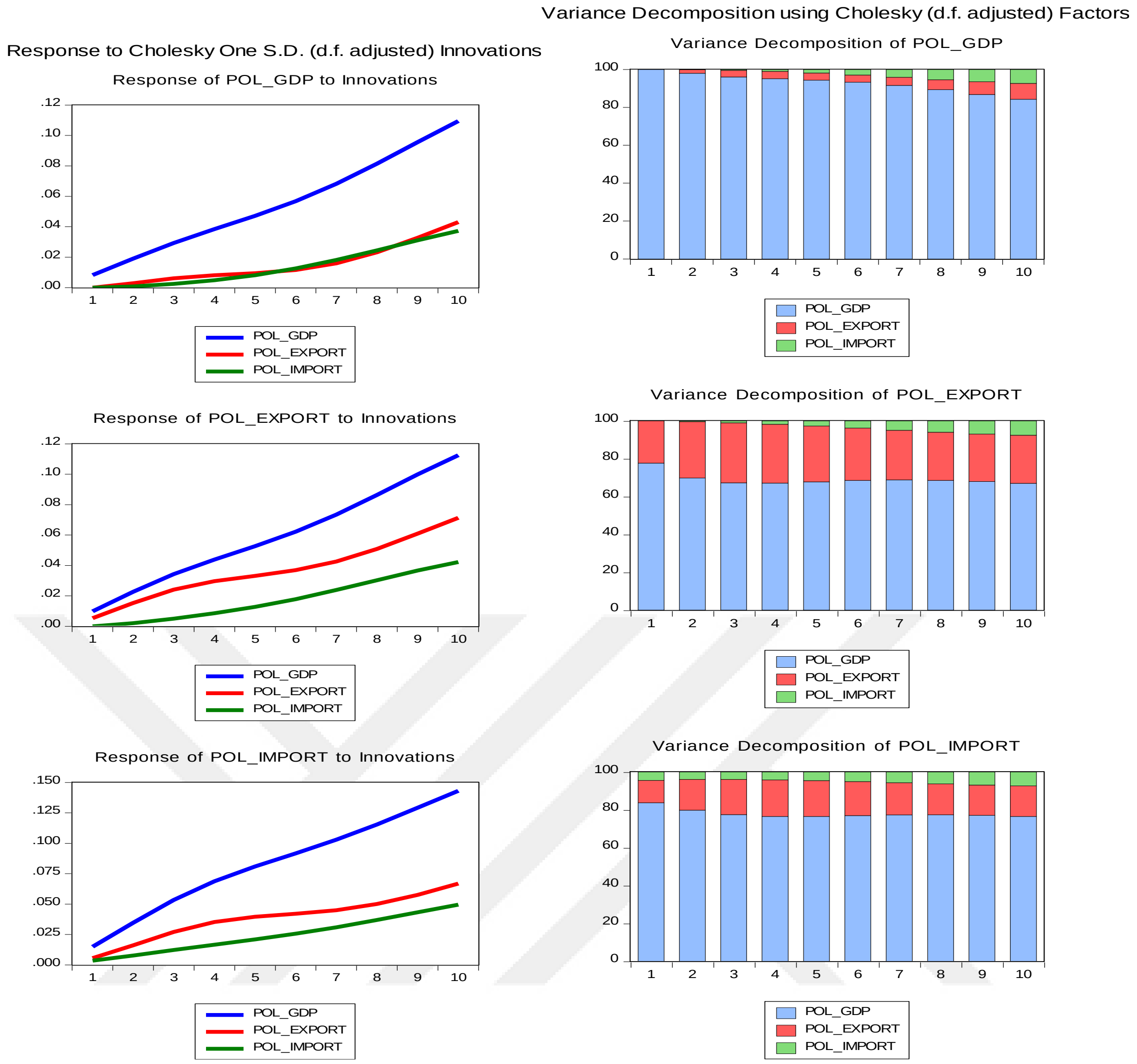
Model Diagnostics (Peru)

Model Diagnostics	
Autocorrelation Test	VEC Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2, lag 3 and lag 4 have p-values of 0.3767, 0.4492, 0.9849, 0.4092, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%
Heteroscedasticity Test	VEC Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 139.2878 and a p-value of 0.1100 which it makes sure of VEC models reliability.
Normality Test	VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque-Bera joint test result shows that p-value is 0.3514 and higher than 0.05% significance level which indicates sample data is normally distributed.
Stability Test	Inverse roots of AR characteristic polynomial shows that all roots are within the unit circle. It means that this model is stable.

10. POLAND

Vector Error Correction Test (Poland)

	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
C(1)	-0.218489	0.054198	-4.031288	0.0002
C(2)	0.745774	0.471889	1.580404	0.1195
C(3)	0.648858	0.521319	1.244647	0.2184
C(4)	0.407345	0.230262	1.769052	0.0822
C(5)	-0.467143	0.150763	-3.098536	0.0030
C(6)	-0.009984	0.131184	-0.076104	0.9396
C(7)	-0.360429	0.204325	-1.764005	0.0831
C(8)	0.008682	0.004628	1.875957	0.0658
C(9)	-0.314634	0.073557	-4.277410	0.0001
C(10)	-0.707673	0.640441	-1.104979	0.2738
C(11)	1.475515	0.707527	2.085453	0.0415
C(12)	1.433016	0.312508	4.585532	0.0000
C(13)	-0.794258	0.204613	-3.881757	0.0003
C(14)	0.227919	0.178042	1.280145	0.2057
C(15)	-0.711342	0.277306	-2.565182	0.0130
C(16)	0.024416	0.006281	3.887083	0.0003
C(17)	-0.139396	0.107592	-1.295600	0.2003
C(18)	-0.493094	0.936767	-0.526378	0.6007
C(19)	0.985347	1.034894	0.952124	0.3451
C(20)	0.763128	0.457103	1.669488	0.1005
C(21)	-0.744813	0.299286	-2.488634	0.0158
C(22)	1.052420	0.260420	4.041238	0.0002
C(23)	-0.565004	0.405614	-1.392961	0.1690
C(24)	0.009876	0.009188	1.074858	0.2870
	D(GDP)	**D(EXPORT)**	**D(IMPORT)**	
R-squared	0.980041	0.957649	0.940105	
Akaike AIC	-6.521934	-5.911107	-5.150550	
Schwarz SC	-6.137983	-5.527155	-4.766598	



IRFs (Left) and Variance Decomposition (Right) for Poland

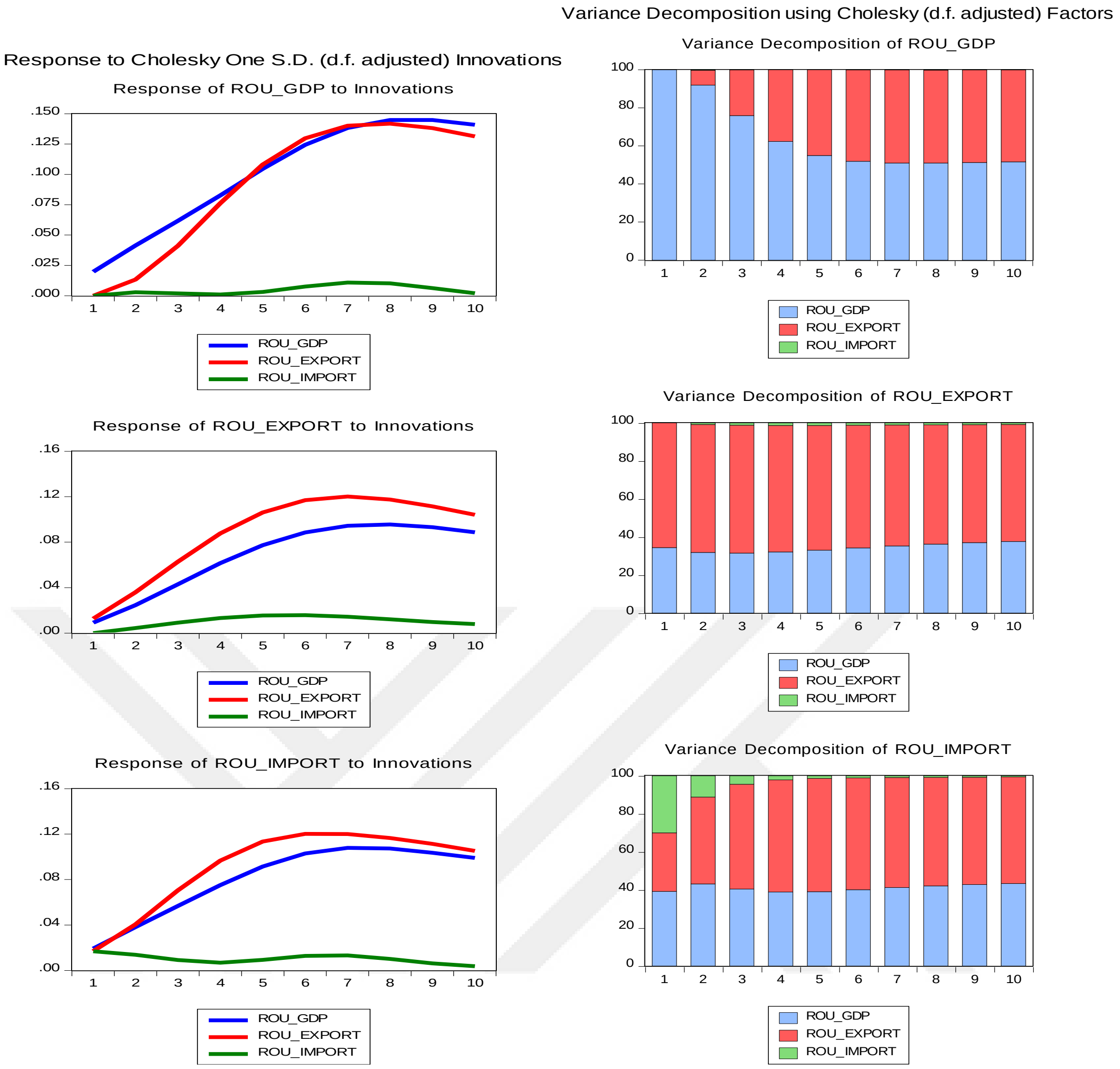
Model Diagnostic (Poland)

Model Diagnostics	
Autocorrelation Test	VEC Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2, and lag 3 have p-values of 0.8519, 0.5128, 0.5197, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%
Heteroscedasticity Test	VEC Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 91.25056 and a p-value of 0.2759 which it makes sure of VEC models reliability.
Normality Test	VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque-Bera joint test result shows that p-value is 0.0740 and higher than 0.05% significance level which indicates sample data is normally distributed.
Stability Test	Inverse roots of AR characteristic polynomial shows that all roots are within the unit circle. It means that this model is stable.

11. ROMANIA

Vector Error Correction Test (Romania)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.102871	0.092004	1.118118	0.2685
C(2)	0.451556	0.274107	1.647373	0.1053
C(3)	-0.275165	0.169357	-1.624765	0.1100
C(4)	0.628792	0.330239	1.904052	0.0622
C(5)	0.035344	0.367439	0.096191	0.9237
C(6)	0.475069	0.218717	2.172072	0.0343
C(7)	-0.015809	0.212026	-0.074563	0.9408
C(8)	-0.043030	0.018914	-2.275067	0.0269
C(9)	-0.027394	0.073036	-0.375081	0.7091
C(10)	-0.139480	0.217594	-0.641012	0.5242
C(11)	0.170809	0.134441	1.270512	0.2093
C(12)	1.535277	0.262154	5.856402	0.0000
C(13)	-0.818788	0.291685	-2.807101	0.0069
C(14)	0.179620	0.173624	1.034535	0.3055
C(15)	-0.111946	0.168313	-0.665108	0.5088
C(16)	0.017077	0.015014	1.137374	0.2604
C(17)	0.313120	0.143454	2.182725	0.0334
C(18)	-0.154260	0.427391	-0.360935	0.7196
C(19)	-0.077796	0.264063	-0.294613	0.7694
C(20)	1.497207	0.514912	2.907693	0.0053
C(21)	-0.729318	0.572916	-1.272992	0.2085
C(22)	0.767185	0.341026	2.249634	0.0286
C(23)	0.058222	0.330594	0.176115	0.8609
C(24)	-0.040948	0.029491	-1.388498	0.1707
	D(GDP)	**D(EXPORT)**	**D(IMPORT)**	
R-squared	0.950048	0.941743	0.836105	
Akaike AIC	-4.768048	-5.229819	-3.879686	
Schwarz SC	-4.380942	-4.842712	-3.492579	



IRFs (Left) and Variance Decomposition (Right) for Romania

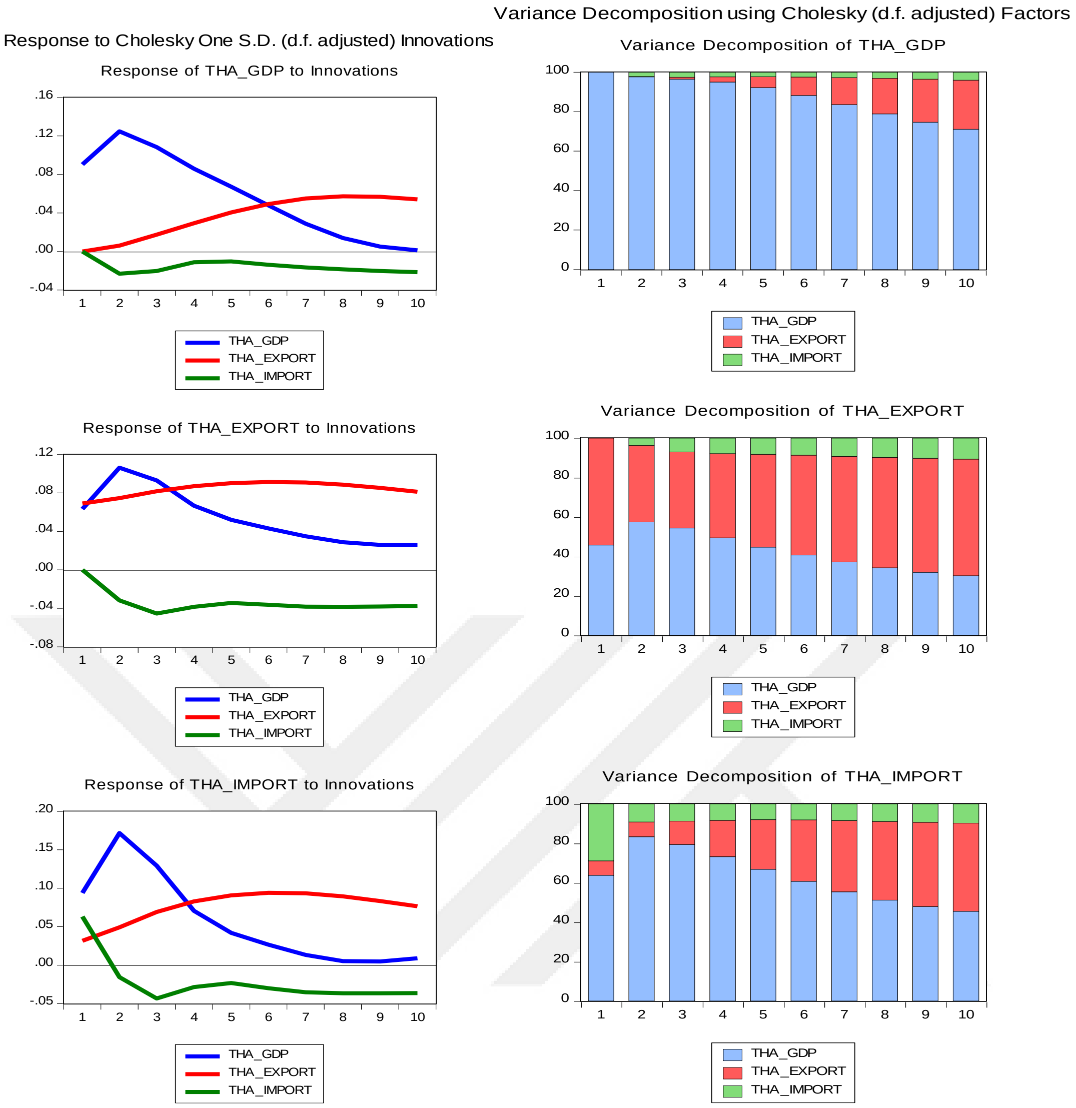
Model Diagnostics (Romania)

Model Diagnostics	
Autocorrelation Test	VEC Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2, and lag 3 have p-values of 0.1158, 0.2287, 0.1215, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%
Heteroscedasticity Test	VEC Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 94.44968 and a p-value of 0.2044 which it makes sure of VEC models reliability.
Normality Test	VEC Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque-Bera joint test result shows that p-value is 0.5443 and higher than 0.05% significance level which indicates sample data is normally distributed.
Stability Test	Inverse roots of AR characteristic polynomial shows that all roots are within the unit circle. It means that this model is stable.

12. THAILAND

Vector Autoregressive (VAR) Test (Thailand)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	1.581313	0.310224	5.097331	0.0000**
C(2)	-0.869844	0.288143	-3.018789	0.0034**
C(3)	0.257413	0.268722	0.957916	0.3409
C(4)	-0.042131	0.291324	-0.144620	0.8854
C(5)	-0.366043	0.222714	-1.643556	0.1040
C(6)	0.296571	0.224930	1.318506	0.1909
C(7)	3.840522	1.968000	1.951485	0.0543*
C(8)	0.777435	0.321539	2.417858	0.0178**
C(9)	-0.745126	0.298653	-2.494955	0.0146**
C(10)	1.313454	0.278523	4.715780	0.0000**
C(11)	0.006104	0.301949	0.020215	0.9839
C(12)	-0.501784	0.230837	-2.173754	0.0325**
C(13)	0.101679	0.233134	0.436140	0.6639
C(14)	1.237898	2.039780	0.606878	0.5456
C(15)	1.575241	0.403828	3.900776	0.0002**
C(16)	-1.529541	0.375085	-4.077853	0.0001**
C(17)	0.827114	0.349804	2.364511	0.0204**
C(18)	0.026202	0.379225	0.069093	0.9451
C(19)	-0.244447	0.289914	-0.843173	0.4015
C(20)	0.248433	0.292798	0.848480	0.3986
C(21)	2.415305	2.561806	0.942814	0.3485
	D(GDP)	**D(EXPORT)**	**D(IMPORT)**	
R-squared	0.977379	0.991504	0.984247	
Akaike AIC	-1.795125	-1.723476	-1.267736	
Schwarz SC	-1.484055	-1.412407	-0.956666	



IRFs (Left) and Variance Decomposition (Right) for Thailand

Model Diagnostics (Thailand)

Model Diagnostics	
Autocorrelation Test	VAR Residual Serial Correlation LM Tests are tested for b LM-Statistics show that lag 1, lag 2, and lag 3 have p-values of 0.7960, 0.6437, 0.2386, respectively. So, it draws conclusion that there is no existence of autocorrelation regarding to critical value at 5%
Heteroscedasticity Test	VAR Residual Heteroskedasticity Test result indicates absence of heteroscedasticity. The results of test confirm that model has greater p-values than the critical values at 5% significance level with chi-square value of 81.80486 and a p-value of 0.2011 which it makes sure of VAR models reliability.
Normality Test	VAR Residual Normality Tests are used to detect whether model is normally distributed or not. Jarque-Bera test as a goodness-of-fit test, is run for checking given sample data normality. Jarque-Bera joint test result shows that p-value is 0.2045 and higher than 0.05% significance level which indicates sample data is normally distributed.
Stability Test	Inverse roots of AR characteristic polynomial shows that all roots are within the unit circle. It means that this model is stable.