

**A TIME SERIES ANALYSIS OF IMPORT DEPENDENCY OF TURKEY'S  
EXPORT**

**Master's Thesis**

**Cemre Nur ÇETİN**

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**MASTER'S THESIS**

**Department of Economics**

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**Anadolu University**

**Graduate School of Social Sciences**

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## FINAL APPROVAL FOR THESIS

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## ÖZET

### TÜRKİYE EKONOMİSİNDE İHRACATIN İTHALATA BAĞIMLILIĞI: ZAMAN SERİSİ ANALİZİ

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İktisat Anabilim Dalı

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Her ülke ekonomik büyüme için farklı stratejiler uygulamaktadır. Bunlardan en bilineni ihracata dayalı ve ithalata dayalı büyüme stratejileridir. Bu bağlamda, dış ticaret önemli bir rol oynamaktadır. Ancak dış ticaret ve ekonomik büyüme arasındaki ilişkinin analizinde, sadece ithalatı ihmal eden ya da sadece ihracatı dikkate alan analizler yanlış sonuçlar doğurabilir. Örneğin ihracat hızlı ithalat büyümesiyle genişlediğinde, ithalat ekonomik büyüme için önem arz edebilir. Bu yüzden ikisi birlikte değerlendirilmelidir. Böylece ihracat ve ithalatın birlikte değerlendirilmesi daha doğru bulgulara ulaşmak ve uygun politika önerisi vermek için son derece önemlidir.

Bu çalışma Türkiye ekonomisi için “ihracatın ithalata olan bağımlılığının” varlığını 1980-2018 dönemi için çeyreklik verilerle ekonomik büyüme, ihracat, ithalat ve ithalatın alt kalemleri arasındaki nedensellik ilişkisini inceleyerek göstermeyi amaçlamaktadır. Bu amaca ulaşmak için, Vektör Otoregresif Model, Vektör Hata Düzeltme Modeli, Johansen Eşbütünleşme Modeli, Granger Nedensellik Testi, Etki-Tepki Fonksiyonu ve Varyans Ayırıştırma Analizi kullanılmıştır. Ampirik sonuçlara göre, ihracatın ithalata bağımlılığı anlamına gelen ithalattan ihracata ve büyüme odaklı ithalat olarak adlandırılan ekonomik büyümeden ithalata doğru tek yönlü nedensellik ilişkisi vardır. Ayrıca, ithalat ve aramalı ithalatı arasında çift yönlü nedensellik, tüketim malı ithalatından ithalata, sermaye malı ve aramalı ithalatına, ihracattan tüketim malı ithalatına, ekonomik büyümeden tüketim malı ve aramalı ithalatına, aramalı ithalatından ve sermaye malı ithalatından ihracata doğru tek yönlü nedensellik ilişkisi bulunmuştur.

**Anahtar Sözcükler:** İhracatın ithalata bağımlılığı, Bağımlılık, Dış ticaret, Türkiye ekonomisi, Nedensellik.

## ABSTRACT

### A TIME SERIES ANALYSIS OF IMPORT DEPENDENCY OF TURKEY'S EXPORT

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Anadolu University, Graduate School of Social Science, June 2019

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Various countries have implemented different strategies for providing economic growth. The most known of these are export-led and import-led growth theory. In this regard, foreign trade play an important role. However, analyses that neglect only import or consider only export may result in false findings in the analysis of the relationship between foreign trade and economic growth. For example, when export expands with high import growth, import may be crucial for economic growth. So, both must be evaluated together. Therefore, it is important to achieve more accurate findings and give appropriate policy suggestion.

This study aims to indicate the availability the “import dependency of export” for Turkey’s economy by investigating the causal relationship between export, import, economic growth and sub-group of import by using quarterly data for the period between the years 1980 and 2018. For this purpose, Vector Autoregression Model, Vector Error Correction Model, Johansen Cointegration Model, Granger Causality Test, Impulse-Response Function and Variance Decomposition Analysis were applied. According to empirical results, there is unidirectional causality relationship from import to export, which is import dependency of export, and there is unidirectional causal relationship from economic growth to import, which is called growth-led import. Moreover, it was found that there is bidirectional causal relation between import and intermediate goods import, and there is unidirectional causal relation from consumption goods import to import, capital goods import, and to intermediate goods import, from export to consumption goods import, from economic growth to consumption goods import, and to intermediate goods import, from intermediate and capital goods import to export.

**Keywords:** Import dependency of export, Dependence, Foreign trade, Turkish Economy, Causality.

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I thank all of them from the bottom of my heart for their support and love.

**STATEMENT OF COMPLIANCE WITH ETHICAL PRINCIPLES AND RULES**

I hereby truthfully declare that this thesis is an original work prepared by me; that I have behaved in accordance with the scientific ethical principles and rules throughout the stages of preparation, data collection, analysis and presentation of my work; that I have cited the sources of all the data and information that could be obtained within the scope of this study, and included these sources in the references section; and that this study has been scanned for plagiarism with "scientific plagiarism detection program" used by Anadolu University, and that "it does not have any plagiarism" whatsoever. I also declare that, if a case contrary to my declaration is detected in my work at any time, I hereby express my consent to all the ethical and legal consequences that are involved.

CEMRE NUR ÇETİN

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## LIST OF SYMBOLS AND ABBREVIATIONS

$\alpha$	: Coefficient of equation
$\beta$	: Coefficient of equation and cointegration vectors
$\Delta$	: Difference of the relevant variable
$\delta$	: Coefficient of equation and constant term
$\varepsilon$	: Error term
$\eta$	: Coefficient of equation and error term
$\gamma$	: Coefficient of equation
$\lambda$	: Estimated value of the characteristic unit roots
$\mu$	: Coefficient of equation
$\phi$	: Coefficient of equation
$\sigma$	: Coefficient of equation
$\theta$	: Coefficient of equation
ADF	: Augmented Dickey Fuller
AIC	: Akaike Information Criterion
ARDL	: Autoregressive Distributed Lag
BEC	: Broad Economic Categories
CAPM	: Imported Capital Good
CCR	: Canonical Cointegration Regression
CONSM	: Imported Consumption Good
CU	: Custom Union
DF	: Dickey Fuller
DOLS	: Dynamic Ordinary Least Squares
ECT	: Error Correction Term
EU	: European Union
FMOLS	: Fully Modified Ordinary Least Squares
FPE	: Final Prediction Error
GDP	: Gross Domestic Product
GNP	: Gross National Product

HQ	: Hannan-Quin Information Criterion
IMF	: International Monetary Fund
INTM	: Imported Intermediate Good
IRF	: Impulse Response Function
ISI	: Import Substitution Industrialisation
LR	: Sequential Modified
RER	: Real Exchange Rate
SC	: Schwarz Information Criterion
SEE	: State Economic Enterprise
USA	: United States of America
VAR	: Vector Autoregression
VDA	: Variance Decomposition Analysis
VECM	: Vector Error Correction Model
WB	: World Bank
IFYDP	: First Five Year Development Plan
IIFYDP	: Second Five Year Development Plan
IIIFYDP	: Third Five Year Development Plan

## **INTRODUCTION**

Foreign trade has existed fulfilling deficiencies of needs and desires. Moreover, foreign trade leads to increase in welfare level of the society. According to foreign trade history, mercantilism was accepted as the beginning of the utilization trade policy. Since the 19th century, classical economics has brought forward scientific ideas about the causes of foreign trade. Thus, the basis of foreign trade has been established in present day.

International trade is a main source of foreign exchange for all the countries in the world. The amount of the world trade has been rising due to technological and political developments in the world. Foreign trade mainly consists of import and export which are the determinants of relations between the countries.

Even though import and export are crucial for foreign trade in all countries, developing countries have faced serious problems. The main reason of these problems is the import input dependency in foreign trade activities. This causes the country to fail in meeting all its needs with its own resources. Therefore, a need for raw materials, intermediate inputs or other imported inputs from other countries arises.

Turkey implemented a self-enclosed economic policy in the beginning of the 1960s. Import substitution policy which encourages replacing foreign inputs with domestic product was applied. Since the policy failed to meet the expectation, export-focused industrialization policy was begun to be implemented in 1980. However, the macroeconomic structural problems such as high inflation, import dependency of export, domestic and foreign debt, current deficit played a significant role in the crises. Because of the crises, economic policies became important and the country tried to implement the policies attentively.

In the international trade expansion process of Turkey which began with 24 January Decisions a rapid improvement was targeted both in economy and industry. In line with this target, incentive policies were implemented to increase export and expectation was reached to steady growth. Since the structure of Turkey's foreign trade depends largely on import largely, import dependency of export caused a vicious circle in current deficit to reduce. To break vicious circle of this, it is required to decrease import dependency of export. Therefore, the policies which reduce the import dependency of export are important for the country's economy and foreign trade.

The purpose of the paper is to analyse the import dependency of export in Turkey and discuss possible policy proposal. The paper consists of three sections.

In the first section of the paper, a theoretical and conceptual framework was formed, and literature review was conducted.

The second section consists of Turkey's economic history which includes import substitution and export orientation period. The development of foreign trade and applied policies are examined with basic macroeconomic indicators from the 1960s to the present period. In this section, the import dependency of export in Turkey's economy has been illustrated with figures and interpreted.

In the third section, it has been analysed whether there is an import dependency of export for Turkey's economy. In this context, time series analysis was applied, and various results have been reached with the causality tests. As a result of evaluation, proposals have been made proposals to reduce import dependency, which has become a major problem in Turkey's foreign trade.

## **CHAPTER ONE**

### **1. FOREIGN TRADE AND ECONOMIC GROWTH**

#### **1.1. Theoretical Framework**

Trade, which start with barter economy, has always existed from past to present and has changed until now. Today, trade has taken on international dimension. Foreign trade plays an important role for international economic relations. While foreign trade has gained importance with mercantilism and physiocracy, which explain the source of growth, foreign trade continues with classics who believe that both sides should obtain benefit in economic relations.

##### **1.1.1. Mercantilist period**

Mercantilism is a philosophy proposed between the 1500 and 1800 (Reynolds, 2007). Mercantilism was mainly based on wealth of nation state and protectionism. Gold and silver were accepted as source of wealth. Purpose of the economic activities was to increase the inflow of bullion into country (Reynolds, 2007). Gold and silver were collected due to foreign trade. Also, Thomas Mun who was one of the first mercantilist writers advocated that foreign trade increases wealth of the nation state (Hinton, 1955). Mercantilist system assumes that the total wealth of the world is fixed. According to this assumption, while a nation gains from trade, the other one loses. Namely, one nation has to take some wealth from another. So, international trade is a zero-sum game (Colander and Landreth, 2002). In this context, mercantilism can be defined as “economic nationalism” (Rankin, 2011).

The main goal in mercantilist system is to decide best policies providing wealth and power of nation. To achieve this goal the nation should focus on production, instead of consumption. In this regard, doing more export and less import becomes important (Colander and Landreth, 2002). Because the purpose of mercantilism gains from foreign trade originated only from exporting (Pincus, 2012). This situation is called “positive balance of trade theory”. The concept of positive balance of trade theory means that trade policy was protected with bounties, tariffs, quotas, and etc (Biddle, Davis, and Samuels, 2003). In other words, gains from trade are provided by government intervention. However, some of the enlightened who opposed to government intervention and other policies caused the emergence of a new economic thought which is called physiocracy.

##### **1.1.2. Physiocracy**

The economic thought of physiocracy emerged in about 1750s in France and lived in short period from about 1750s to 1780s. Physiocracy etymologically is the rule of the nature (Colander and Landreth, 2002).

The leader of this economic thought was François Quesnay and *Tableau Economique* was his most important contribution to economics (Steckel, 2008). The *Tableau Economique* shows the core of the physiocratic analysis (Colander and Landreth, 2002). Physiocracy system is based on a natural order. Therefore, agriculture has particular importance. According to Quesnay, agriculture was the most productive sector and surplus value was derived from the land (Ozguven, 1992). Physiocrats explained definition of “net product” as a surplus of land.

A key idea of physiocracy was that agriculture was the productive sector of an economy as large-scale industry had not improved yet in France in the 1750s. Industry could not have surplus in the budget. The manufacturing sector did not lead to economic growth. So, only the surplus value in the agriculture sector provided economic growth according to physiocrats (Colander and Landreth, 2002).

The main aim of foreign trade of Physiocracy is to export agricultural products since only export of agricultural products provides economic welfare, not industrial goods. In opposition to mercantilism, free trade is advocated in physiocracy. According to physiocrats, government should not intervene in economy and individuals should be free in their economic activities. Thus, physiocracy leads the classics with the idea of “*laissez faire, laissez passer*” (Rothbard, 1995).

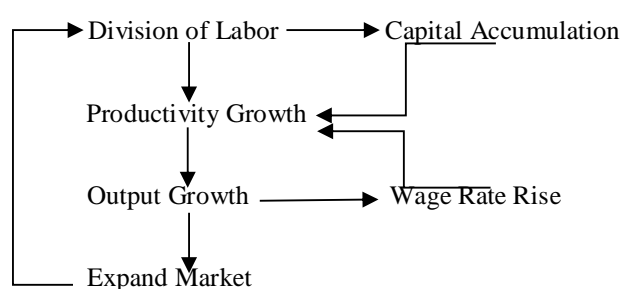
### **1.1.3. The classical theory of foreign trade**

The classical period is an economic thought which continued more than one hundred years. The homeland of the classical period was England. Most of the well-known leaders of the classical period were Adam Smith (1723-1790) and David Ricardo (1772-1823). *The Nature and Causes of the Wealth of Nations* (1776) written by Adam Smith was the major contribution to economics. Also, David Ricardo wrote *On the Principles of Political Economy and Taxation* (1817), which was the other major contribution to economics in this period (Colander and Landreth, 2002).

According to Smith, the source of economic growth is capital accumulation. Profit and savings lead to accumulate capital. If savings become investment, economic growth will occur (Berber, 2006). Smith emphasized on division of labor and specialization on

economic growth. As division of labor increases, productivity of labor also increases. Thus, output per worker increases (Unsal, 2007). Due to division of labor, it saves time in the production process, labor gets easier, and technology develops. Exchange, self-interest, and size of market are important for division of labor and specialization. If market size and capital accumulation is enough, division of labor will be beneficial (Berber, 2006; Unsal, 2007).

According to Smith, the source of wealth is division of labor. Smith's growth model based on division of labor is summarized as follows.



**Figure 1.1.** *Smith's Growth Model (Unsal, 2007)*

Mercantilists, physiocrats, and Adam Smith investigated the source of wealth. However, David Ricardo examined how national income is distributed among the factors of production. Ricardo's growth model, mentioned in *On the Principles of Political Economy and Taxation*, analysed diminishing returns, income distribution, wage, rent, and profit (Berber, 2006; Unsal, 2007).

According to Ricardo, there are three types of people in economic activity. These are landowners, capitalists, and workers. They earn rent, profit, and wage respectively. Earning profit is the only purpose of the capitalists. Thus, they rent more workers, and this means more product. Although capitalists are the most efficient class, the only class who benefit from growth process is landowners. According to Ricardo's observation, capitalists get worse and landowners get better, while worker's situation does not change in the long run (Unsal, 2007).

Besides their growth theory, they studied about international trade. Adam Smith's foreign trade theory is theory of absolute advantage and David Ricardo's foreign trade theory is comparative advantage theory.

Theory of absolute advantage is based on division of labor and specialization on production. Due to specialization, more goods can be produced with same amount of labor (Kilic, 2002; Schumacher, 2012). The division of labor and specialization on production works internationally and domestically the same way. This means that a country produces and exports a good which it can produce more cheaply than the other countries and imports the good which it cannot produce more cheaply than the other countries. In this situation, the country has absolute advantage on the production of this good (Schumacher, 2012). In other words, absolute advantage is that a country is absolutely more efficient in production of a commodity than another country. In brief, Adam Smith's theory of foreign trade considers economic growth that affects foreign trade (Kilic, 2002).

Classically, David Ricardo followed Adam Smith with his own international trade theory by developing Smith's theory. His foreign trade theory has comparative advantages (Meoqui, 2014).

Ricardo examined the question of which one of the countries has absolute advantage in production of both goods. This theory focuses on the cost of production in each country before the trade and estimate whether there is gain or loss from trade. Thus, which country will export or import what kind of commodities is known. In summary, free foreign trade causes each country to specialize in goods in which they have comparative advantage (Kilic, 2002).

#### **1.1.4. The neoclassical theory of foreign trade**

After the Classical Theory, the neoclassical economists brought an initiative for removing some of the major problem with reference to the assumptions of Ricardo's Comparative Advantage Theory. Gottfried Haberler who criticises the classical labor theory of value and assumption of homogeneous labor improved the concept of opportunity cost, which includes capital, natural resources, entrepreneurship. Another important point that classics could not completely explain in foreign trade is that it did not dwell on the reasons which create differences in foreign labor productivity. Factor endowment theory developed by Heckscher and Ohlin overcame the lack of comparative advantages theory (Saridogan and Yuksel, 2011).

##### ***1.1.4.1. Factor endowment theory***

Factor Endowment Theory or Heckscher-Ohlin Theory argued that the country export goods whose production is intensive in the country's relatively abundant factor and import the other goods that use intensely the country's relatively scarce factor (Blaug, 1992). According to this theory, if a country has abundant production factor, it obtains a comparative advantage in the goods which use it more intensively. The country produces the goods at lower price and specializes on these goods (Saridogan and Yuksel, 2011).

Three different theories were derived from Heckscher-Ohlin Theory. The first one is Factor Price Equalization Theorem. According to this theory, free trade equalizes the factor prices across countries. Due to free trade based on international specialization, as the countries will increase their production in the goods which have abundant factors, these factor prices will increase. On the other hand, the demand for the scarce factor will decrease and the price will decrease. The second one is Stolper-Samuelson Theorem. While free trade provides benefit for the abundant factor owners in a country, protectionism provides benefit for the scarce factor owners. The last one is Rybczynski Theorem. According to this theorem, if supply of a factor increases, the production of the goods that use it intensively expands and the production of the other goods begins to decrease (Saridogan and Yuksel, 2011).

The Factor Endowment Theory brought a different interpretation to the foreign trade theory by explaining the inter-industry trade between countries which have different factor endowments. However, it failed to explain the intra-industry trade between the developed countries which have similar factor endowments (Vatansever-Deviren, 2004).

#### **1.1.5. New foreign trade theories**

The reasons such as increasing the intra-industry trade between the countries which have similar factor endowments, giving a paradoxical result of Factor Endowment Theory formed a basis for New Foreign Trade Theories. Although New Trade Theories cannot explain the whole international trade, it is complementary to traditional foreign trade theory (Vatansever-Deviren, 2004).

These theories that emerged at the end of 1970s are important in the international trade. They are based on imperfect competition and increasing return to scale. Other theories explain the importance of imports for countries, new theories explain the reason why countries need to import. These theories are Skilled Labor Theory, Technology Gap Theory, Product Cycle Theory, Preference Similarity Theory, Economies of Scale

Theory, Monopolistic Competition Theory and Intra-Industry Trade Theory (Seyidoglu, 2003).

Skilled Labor Theory which was developed by Keasing and Kenen explain the cause of the foreign trade between countries with skilled labor differences. A country that is rich in qualified labor specializes in the production of goods that are related to these factors and deal in them (Yilmaz, 2015).

Technology Gap Theory which was suggested by Posner argue that an industrialized country that discovers a new product and produces that product, it becomes the monopol and first exporter of this good (Yilmaz, 2015).

Product Cycle Theory which was theorized by Vernon based on the trade between copycat countries and innovator countries. According to Vernon, there are various stages between the first invention of a product and the standardization of it. According to the stage of the product, production and foreign trade change. At the beginning, the country that invents and exports a product becomes importer of the same good at the end of the stages (Vernon, 1966).

Preference Similarity Theory which was claimed by Linder explain that the countries which have similar pleasures and preferences trade with each other. Also, if the countries have similar levels of per capita income, demand structure can be similar. Therefore, countries demand similar goods (Yilmaz, 2015).

According to Economies of Scale Theory, countries that have broad domestic market reduce their cost by utilizing internal and external economies. Thus, they have a comparative advantage in goods produced at lower cost. Countries that do not have broad domestic market can benefit from internal and external economies if they produce for the world markets (Vatansever-Deviren, 2004).

Monopolistic Competition Theory was firstly suggested by Chamberlin and Robinson. According to this theory, there are imperfect competition and differentiated products in the real world. So, the Classical Trade Theory cannot explain real life side of foreign trade. Product differentiation is an important factor in the emergence of monopolistic competition. The purpose of the product differentiation is to create the impression that some goods are different from other goods for consumers. Thus, those who cannot attain power in this market becomes importer, while those who attain power becomes exporter (Vatansever-Deviren, 2004).

Intra-Industry Trade Theory based on the export and import of homogeneous or similar goods in same industry group. However, it differs from quality, brand, and appearance. So, intra-industry trade includes differentiated goods trade. The new trade theories express intra-industrial trade of differential goods between the same countries. Consequently, new trade theories supplement quality of traditional trade theories (Yilmaz, 2015).

## **1.2. Export, Import, and Growth**

There is a vast of literature about foreign trade, which is mainly export, import and growth (Berg and Krueger, 2003). Many economists have researched the relationship between export, import and economic growth over the years. These papers search for an answer to the question of how a country can improve its economic growth and what the source of economic growth is (Acaroglu, Beşer, and Dura, 2017). There has been much disagreement among economists about the relationship between foreign trade and economic growth in the recent times. Many economists accept that the source of economic growth is export. However, some economists advocate that import improves economic growth (Tyler, 1981). Hence, the relationship between economic growth and foreign trade is complicated. The main point is direction and importance of the relationship (Aydin and Korkmaz, 2015).

Countries implement different strategies for providing economic growth. The most common of these are export-led growth hypothesis and import substitution growth hypothesis. In the analysis of the relationship between economic growth and foreign trade, considering only export or neglecting only import may be misleading. For instance, import may be crucial for economic growth, when export begins to expand with rapid import growth. So, export and import must be evaluated together. Thus, more accurate results could be achieved (Awokuse, 2008; Aydin and Korkmaz, 2015).

When the relationship between export, import, and economic growth is investigated, 10 different results can be found. These are:

- Causality running from import to economic growth (Import-led Growth)
- Causality running from export to economic growth (Export-led Growth)
- Causality running from economic growth to import (Growth-led Import)
- Causality running from economic growth to export (Growth-led Export)

- Causality running from import to export (Import Dependency of Export)
- Causality running from export to import (Export Dependency of Import)
- Bidirectional causality between import and economic growth (Growth-led Import and Import-led Growth)
- Bidirectional causality between export and economic growth (Growth-led Export and Export-led Growth)
- Bidirectional causality between import and export (Import Dependency of Export and Export Dependency of Import)
- There is no causality link between export, import, and economic growth (Aydin and Korkmaz, 2015).

### **1.2.1. Export-led growth hypothesis**

The most common view among economists is that export increases economic growth. According to Classical Theory, there is a strong relationship between export and economic growth. Since the liberalisation of foreign trade, international division of labor and specialization on production of export goods have increased. According to Ricardo's comparative advantage theory, each country must specialize in goods in which they have comparative advantages. Thus, productivity increases, and economic growth occurs among countries (Aktas, 2009; Gulmez and Yardımcıoğlu, 2013; Agir, Sahbaz, and Yanar, 2014). Therefore, we can say that exports affect economic growth positively. The effects of increase in exports on economic growth are:

- Export increases the real output. Increase in export encourages the local firms to specialize on the production of export commodities. Thus, productivity level increases, which will lead to increase in economies of scale.
- Export decreases cost of production. Thus, quality of goods increases.
- Export increases competition among firms. Increase in competition lead to technological progress.
- Export improves the pressure on balance of payments and raises employment opportunities.
- Export raises intra-industry trade and helps the country to integrate in the world economy. Thus, export decreases the effects of external shocks on the local economy.

- Export brings in foreign exchange which leads to increase in imported intermediate goods and investment goods. Thus, import helps economic growth as a driving force (Abou-Statit, 2005; Erdogan and Ozer, 2006; Gul and Kamaci, 2012; Gokmenoglu, Sehnaz, and Taspinar, 2015).

Export growth is a major determinant of the production and employment growth of an economy (Ramos, 2001; Awokuse, 2008). Awokuse (2003), Abou-Statit (2005), Biyase and Zwane (2011), Kilinc-Savrul and Zeren (2013), Ozcan and Ozcelebi (2013), Ee (2016), Acaroglu, Beser and Dura (2017) argue that causality running from export to economic growth and define as the export-led growth hypothesis.

The export-led growth hypothesis advocates to incentive to the production via diverse economic and governmental policies. According to this hypothesis, export is an important component that accelerates economic growth. (Abou-Statit, 2005; Agir, Sahbaz and Yanar, 2014). Exports can be shown as an engine of economic growth in three ways. Firstly, export provides output growth directly as a catalyst. When export expands, output growth also expands. So, export enlargement can be approved as a component of total output. For domestic exportable goods, a rise in foreign demand can cause an overall growth in output through a rise in employment and income in exportable sector. Secondly, export expansion can also influence growth indirectly via different channels such as: greater capacity utilisation, efficient resource allocation, inducing of technological progress due to foreign market competition, utilization of economies of scale (Awokuse, 2008 cited Helpman and Krugman, 1985). Finally, export expansion contributes to growth through the part in increasing the supply of foreign exchange and, so does import (Esfahani, 1991). In this way, the export-led growth hypothesis indicates that export growth provides productivity growth (Herzer, Nowak-Lehmann D., and Siliverstovs, 2006).

The export-led growth hypothesis contributes to economic growth by the following three ways. Firstly, according to Keynesian argument, an increase in exports leads to an increase in production volume and employment via foreign trade multiplier. Secondly, the foreign exchange made by export growth is used in importation of investment and intermediate goods. Finally, the volume of and the competition in export sectors lead to economic growth through economies of scale and improvement in technological progress (Ramos, 2001).

The export-led growth hypothesis claims that export improves economic growth through various channels. For instance, any increase in technological progress, economies of scale, employment, and resource allocative efficiency affect economic growth, when export increases (Todaro, 2000).

The export-led growth hypothesis is an outward oriented strategy, so export is important for productivity growth in the outward oriented strategy. Exporting firms play a crucial role in spreading of global technologies and management practices into the local economy. Thus, they impact trade and productivity growth positively (Coe, Helpman, and Hoffmaister, 1995).

### **1.2.2. Import substitution growth hypothesis**

The import substitution growth strategy was more prevalent in developing countries in the 1950s and 1960s. Import substitution implies that decline or eliminate completely the importation of the goods. Hence, domestic firms are protected against foreign competition. Tariff rates and other import duties have been used to protect the domestic industry in import substitution strategy. And also, domestic producers have the incentive to tap into and endogenize internationally available knowledge (Bruton, 1970; Mody and Yilmaz, 2001; Abou-Statit, 2005).

Import substitution is a rise in the production of domestic goods, while declining the consumption of imported goods. The import substituting goods are the goods of domestic producers. These products replace import similar market because of their more interesting consumer properties. The policy of import substitution is relevant to rise profits of domestic industry. According to supporters of this argument, sustainable economic development of a country is possible just that raise the output of its own products. A country can raise the level of industrial self-sufficiency (Ershov and Ershova, 2016).

There is the term of import substituting element, in the case of import substitution at the stage of production. These elements can act as raw materials, technology, certification, equipment, intangible assets, and components (Ershov and Ershova, 2016).

Import substitution policy has strict process for imported goods. Import substitution policy is characterized by top heavy exchange rates and quantitative limitation or restrictive tariffs for many goods. The purpose of import substitution policy reduces

dependence on international economy. However, external dependency increases in practice because of import intensive activities. So, the economy becomes weakens against decreases in availability of foreign exchange (Krueger, 1985).

Import substitution policy has not been considered as a long run economic strategy. It is not important whether a country has implemented this policy successfully or not. The aim in import substitution policy is protection of domestic producers and economic independence but international experience showed that import substitution is unacceptable for maintaining of economic isolation. For instance, there are no standards of quality control because there is no competition, and the small magnitude of local markets in developing countries restrains their economic growth under this strategy. These examples show the detrimental effects resulting from the import substitution strategies (Tyler, 1982; Krueger, 1985; Ershov and Ershova, 2016).

### **1.3. The Relationship Between Export, Import and Economic Growth: Literature Review**

The discussions about the effects of imports and exports on economic growth are based on the classics. So, there are many studies in the literature that examine the relationship between foreign trade and economic growth. Some studies differ in terms of the countries, years and methods. Therefore, there is no exact result, which is consensus, about the effect of foreign trade on economic growth. While some studies defend that exports expand economic growth, other studies defend that imports contribute economic growth. A considerable amount of studies has complicated results. In this part, studies which are related to Turkey and other countries are summarized in order.

Many researchers studied the relationship between foreign trade and economic growth. However, there are very few papers about import dependency of export. These articles related to import dependency of export are Deger et. al. (2013), Camurdan (2013), Rencber and Tuncsiper (2017), Acet, Erdogan, and Koksal (2016), Aydin and Yurdakul (2018), Tuncer (2002), Ciftci, Kucukaksoy, and Ozbek (2015), Dereli (2018), Berber and Kurt (2008), Akbas and Senturk (2013). Deger et. al. (2013) examined the causal relationship between export, import, and economic growth in the framework of Feder model (1982) for Turkey and using Toda-Yamamoto causality test with both monthly and annual data. While monthly data is for the period between 1990 and 2008, annual data covers for the period between 1980-2007. According to the results, export is important

for economic growth until import is added to the model. When import is added to the model, the importance of export disappears. Export and economic growth are affected by import, and export affect growth via import. The causality test shows that there is bidirectional causality between industrial production index, export and total import. Also, it was found that bidirectional causality between export and intermediate import goods. There is causality from imports of investment good to export. This shows the presence of import-based export for Turkey. Camurdan (2013) investigated the relationship between exports, imports and economic growth applying Granger causality test by using quarterly data from 1999 to 2013. According to empirical evidence, export depends on import and there is causality from exports to growth. This result shows that import is necessary for export. So, imports are key variable for growth and exports in Turkey. Rencber and Tuncsiper (2017) studied the causal link between foreign trade and economic growth using Granger causality test with quarterly data for Turkey between 2002 and 2016. Empirical results show that there is the causal link from import to economic growth and causality running from import to export. According to results, there is no significant relationship between export and economic growth. This result implies the absence of export-led growth hypothesis for Turkey. Export rises in parallel with import in Turkey. In order to export, it is needed to import. To produce exporting goods, there is a necessity that it is imported of intermediate and capital goods. It means that export is dependent on import. In addition, causality results show that import push growth hypothesis is valid for Turkey. Acet, Erdogan and Koksak (2016) investigated the causal link between export, import and economic growth for Turkey using quarterly data that covers the period between the years 1998 and 2013. Granger causality test was used. Empirical results show that there is bidirectional causality relation between export, import and gross domestic product (GDP). And also, there is causality from export and import to economic growth. However, export affects economic growth through import inputs. Import is an important determinant on economic growth. Export and import affect economic growth together. However, influence of export on growth depends on imported goods. It is seen that Turkey's export depends on its import. Aydin and Yurdakul (2018) tested availability of either the "export-led growth hypothesis" or the "import-led growth hypothesis" for Turkey. Authors examined the relationship between export, import, and economic growth using Engle-Granger, Johansen and Dynamic Least Squares methods with quarterly data from 2003 to 2016 and 2008 to 2016. The analysis findings using the real values of the

variables point out the validity of the import-led growth hypothesis for Turkey, while the findings of analysis based on the nominal values of the variables show that the export-led growth hypothesis is correct for the country. However, it should not be forgotten that export-led growth for Turkey means import dependency of export as Turkey must import inputs for producing export goods. Namely, it can be said that import also causes economic growth. Tuncer (2002) studied the causal link between exports, imports, GDP and investment using Toda and Yamamoto causality test with quarterly data between 1980 and 2000. Empirical findings show that there is unidirectional causality relationship from GDP to exports, and also bi-directional causality relationship between imports and GDP. It implies that import is a key variable for GDP and affects export. It supports that export is dependent on import in Turkey. Ciftci, Kucukaksoy, and Ozbek (2015) examined causality relationship between exports, imports and economic growth using a few methods for Turkey with quarterly data from 2003 to 2015. These methods are Canonical Cointegrating Regression (CCR), Dynamic Ordinary Least Squares (DOLS) methods, Fully Modified Ordinary Least Squares (FMOLS), Gregory-Hansen cointegration test, Johansen cointegration test and Toda-Yamamoto causality test. According to the result of Johansen cointegration test, no long run relationship was found among variables, while there is long run relationship for Gregory- Hansen cointegration test. According to Toda-Yamamoto which examines the causality relationship, there are bi-directional between exports and economic growth and also there is causality from imports to exports and economic growth. It shows that exports depend on imports in Turkey. Lastly, CCR, DOLS and FMOLS highlight the presence of export-led growth for Turkey just like in other methods. Dereli (2018) examined the relationship between foreign trade and economic growth for Turkey from 1969 to 2016. Granger causality test, Johansen cointegration test, and Granger causality test based on Vector Error Correction Model (VECM) were used in this analysis. Johansen cointegration test shows the presence of long run relationship between export, import and economic growth. According to Granger causality test, there is the causal link from export to import. However, no causal link was found between export and economic growth. According to VECM result, there is a causal link from import to economic growth. This result indicates that export is dependent on import for Turkey. Berber and Kurt (2018) analysed dynamic interactions and causal link between openness and economic growth in Turkey with quarterly data between 1989 and 2003. Vector autoregressive model and variance

decompositions analysis were applied. The results show that there is the bi-directional link between import and growth. It was also found that there is a causal link from export to growth and from import to export. The causal relationship from import to export highlights import dependency of export for Turkey. Apart from others Akbas and Senturk (2013) analysed whether Turkey is dependent on export or import relations which carry out 16 selected countries in the period between 1990 and 2012 with monthly data. Hatemi-J test was used for testing whether there is a long run relationship between import and export. According to empirical test, it was found that export depends on import in Turkey.

Ugur (2008), Baday-Yildiz and Berber (2011), Demirhan (2005), Ilikkan-Ozgur (2015), Uysal and Yardimci (2007) and Aktas-Senkardesler (2018) found results about import oriented rather than related to export oriented. Ugur (2008) investigated the link between economic growth and import using multivariate vector autoregression analysis and Granger causality test for Turkey with quarterly data in the period between 1994 and 2005. According to causality test, there is a bidirectional link between GDP and investment goods imports and raw materials import. Baday-Yildiz and Berber (2011) tested import-led growth theory for Turkey. The relationship between total import, import of intermediate goods, import of investment goods and real GDP was examined using cointegration analysis and vector correction model with quarterly data for the period from 1989 to 2007. The results show that there is causality from total import and intermediate imported input to economic growth, and bidirectional causality between imports of investment goods and economic growth. So, total import, import of investment goods and import of intermediate goods are important for economic growth and affect it considerably. As a result, import-led growth hypothesis is valid for Turkey. Demirhan (2005) studied the causal relation between export and economic growth for Turkey using quarterly data from 1990 to 2004. Vector error correction and cointegration analysis was used for estimating the model. According to the results, there is more than one result about causality. These are bidirectional causality between import and GDP, causality running from GDP to export, causality running from GDP and export to import. While this paper shows that export does not cause economic growth, it indicates a causal link from import to GDP. Import is a significant variable for Turkey. The findings highlight that import leads to increase in export. Demirhan examined the relationship between export and economic growth and obtained similar results with Baday-Yildiz and Berber (2011). When the papers that reached end of import oriented are continued to examine, Ilikkan-

Ozgur (2015) investigated the causal relationship between export, import and GDP for Turkey using Granger causality test and Autoregressive Distributed Lag (ARDL) bound testing approach with quarterly data between the years 1980 and 2014. Empirical results show that there is no evidence about export-led growth hypothesis. However, it was found there is bidirectional causality between import and economic growth. Uysal and Yardimci (2007) analysed the long-term relationship between economic growth, foreign trade and human capital using Johansen and Pesaran's bound test for Turkey from 1968 to 2002. The result of Johansen test and Pesaran's bound test are different when import variable is added. According to empirical result, it was accepted Johansen test result. It was found that import variable is more effective on economic growth than the other variables. Aktas-Senkardesler (2018) investigated the relationship between foreign trade and economic growth in Turkey for the quarterly period between 1980 and 2016 applying Johansen cointegration test, VECM, and Granger causality test. The results show that there is bi-directional relationship between import and economic growth in the long run. For short run, it was found that there is a causal link from import to economic growth.

Besides the import-oriented papers, Ozcan and Ozcelebi (2013), Erdogan and Ozer (2006), Simsek (2003), Takim (2010), Karabulut (2018), Aktar and Taban (2008), Tirasoglu (2012), Sarac (2013), and Acaroglu, Beser and Dura (2017) found export-oriented results. Ozcan and Ozcelebi (2013) studied on export-led growth hypothesis using Johansen co-integration method and VECM in Turkey with monthly data for the period from 2005 to 2011. Authors differ from the other papers due to added variables to the model. These variables are imports, exports, real exchange rate and industrial production index. Consequently, export has positive effect on economic growth while imports affect economic growth positively in the short run. However, this effect of imports is not valid for the long run. Erdogan and Ozer (2006) who examined the causality between exports, imports, and economic growths using quarterly data from 1987 to 2006 concentrate on imports variable as well. According to Granger causality test, causality running from exports to economic growth and imports, and causality from imports to economic growth was found. These results show that there is export-led growth in Turkey. However, this causality is not very strong because the increase in exports is not related to investment. Simsek (2003) investigated the relationship between export growth and economic growth using error correction model and Granger causality test for Turkey in the period of 1960-2002. In comparison with Erdogan and Ozer (2006), Simsek found

causality from economic growth to exports. It indicates growth-led export regime. Takim (2010) investigated the relationship between exports and economic growth using Granger causality test and error correction model from 1975 to 2008. According to empirical results, rising in exports do not led to rising in economic growth. It means that there is the causal link from economic growth to exports in Turkey. Karabulut (2018) studied the relationship between export, import and economic growth applying vector autoregressive model and Granger causality test for Turkey from 1970 to 2016. It was found that there is a causal link from growth to export. It means that economic growth plays more important role on foreign trade. Takim (2010) and Karabulut (2018) found the same result with Simsek (2003) as well. Aktar and Taban (2008) examined causality relation between export and economic growth using cointegration, error correction models and Granger causality test for Turkey with quarterly data between 1980 and 2007. According to empirical results, there is bidirectional relationship between economic growth and exports both in long and short run. Tirasoglu (2012) investigated the relationship between export and economic growth for Turkey using quarterly data from 1998 to 2011. Author used unit root test, cointegration test, causality test and structural break test. According to the results, it was found that there is a bidirectional relation between export and economic growth. Different from others, Aktar and Taban (2008), and Tirasoglu (2012) found bidirectional link between export and economic growth. Contrary to other papers, Sarac (2013) examined a nonlinear relationship between export, import, and economic growth considering Turkey's contraction and expansion periods with quarterly data from 1989 to 2011. As a result, export and import affect economic growth positively both periods. Acaroglu, Beser and Dura (2017) also studied nonlinear relationship between export and growth using quarterly data between 1992 and 2014. Therefore, they used different methods than others. These are Hiemstra and Jones and Diks and Panchenko method. According to Diks and Panchenko model, export-led growth hypothesis is valid for Turkey.

Alam (2003), Katircioglu and Katircioglu (2011), Bayat et. al. (2015), Barisik and Cetintas (2009), Mody and Yilmaz (2001), Rajaguru and Thangavelu (2004), and Lawrence and Weinstein (1999) found that import oriented results for other countries. When the papers that were studied for other countries are considered, Alam (2003) analysed the export-led growth hypothesis in the framework of a production function with annual data for Mexico and Brazil. It was examined for the period of 1955 and 1990 for

Brazil. For Mexico, it was examined from 1959 to 1990. Author failed to find any evidence for export-led growth hypothesis. On the contrary, he found evidence of import-led growth hypothesis. Imported capital goods are important for both countries. According to empirical results, any rise in imports of investment goods increase economic growth. The results show that there is positive relationship between imports of investment goods and economic growth, but the exports of manufacturing industry have no effect on economic growth. Katircioglu and Katircioglu (2011) tested import-led growth hypothesis for North Cyprus using cointegration test from 1977 to 2008. There is long run relationship between import and economic growth, but no support was not found for the import-led growth hypothesis for North Cyprus. On the other hand, error correction model indicates that import is crucial for the country as its economy depends on import from abroad. Bayat et. al. (2015) analysed the causal relationship between foreign trade and economic growth from the point of export-led growth hypothesis. Frequency domain causality was used for Brazil, China, India, South Africa, Russia and Turkey. Data for Brazil, China and India covers the period 1997-2013. Data cover the period of 1993-2013 for South Africa and Turkey, and Russia's data cover the years from 1996 to 2013. Also, all data are quarterly. According to empirical results, there are bidirectional causality between GDP and import for all countries. For Turkey, causality running from GDP to import is acceptable and causality relationship from import to GDP is valid in the short run. The most important results are import dependency of export sectors. These findings are acceptable for Russia, Turkey and India both in short and long run. For Turkey, export-led growth hypothesis is valid in the short run and import-led growth hypothesis and the growth-led import hypothesis are valid in the long run. Other result is that any rise in GDP and export will cause import to raise. It shows the presence of import dependence of export for all countries. Barisik and Cetintas (2009) examined the relationship between economic growth, export and import using panel causality and panel cointegration test for 13 transition countries, namely Slovenia, Slovak Republic, Russia, Poland, Lithuania, Latvia, Kazakhstan, Hungary, Estonia, Czech Republic, Bulgaria, Belarus, and Armenia with quarterly data in the periods 1995-2006. Empirically, causality from economic growth to export and a causal link between import and economic growth were found results were found. It means that import and growth affect each other. Another result is that export influences growth significantly by way of import. Mody and Yilmaz (2001) examined the relationship between foreign investment goods and export

competitiveness. The study covers 14 developed countries and 25 developing countries for the period of 1967-1990. According to empirical results, there is a significant and positive link between imports of foreign investment goods and export competitiveness, and it shows that imported machinery leads cost to reduce in developed and export-led countries. Rajaguru and Thangavelu (2004) analysed the link between trade and labor productivity for nine rapidly Asian countries during between 1960 and 1996. A vector correction model was used in the framework of time series. The findings show that import ensures significant relationship between trade and output growth. So, import is the most important variable for foreign trade. Lawrence and Weinstein (1999) investigated degree of relationship between trade and economic growth for Japan and Korea from 1963 to 1983 and examined the link between total factor productivity in industrial sectors and export-import. It was found that there is significant and positive relationship between import and productivity. Also, it was no found for exports in Japan and Korea. Tariff reduction and increase in import are advantageous especially for Japan.

Awokuse (2003), Abou-Statit (2004), Biyase and Zwane (2011), Ee (2016), Kilinc-Savrul and Zeren (2013), Marin (1992), Parida and Sahoo (2007), Agir, Sahbaz and Yanar (2014) and Mamun and Nath (2005) agreed on the results about export oriented. When the papers that were studied export oriented are considered besides import oriented, Awokuse (2003) examined the causal link between exports and national output growth for Canada with quarterly data from 1961 to 2000 using Granger causality test and vector autoregressive method. The study concentrated on the dynamic causal relationship between exports, output growth, labour, capital, terms of trade, and foreign output shock. According to empirical results, there is causality from export to real GDP. Abou-Statit (2005) investigated export-led growth hypothesis for Egypt over the period of 1977-2003. In this paper, different methods were used. These are cointegration analysis, Granger causality test, vector auto regression (VAR) and impulse response function (IRF) analysis. According to the results, exports, imports, and GDP are not cointegrated. It was found that there is a causal link from exports to GDP growth. According to the results of VAR and IRF test, shocks to exports lead to a substantial provision in GDP. It means that the export-led growth hypothesis is valid for Egypt. Biyase and Zwane (2011) examined the export-led growth hypothesis using five panel data methods for 30 African countries in the period of 1990-2005. These models are pooled ordinary least square, two stage least square, generalized methods of moments and fixed and random effects model. According

to the results, export-led growth hypothesis is valid for these African countries. Ee (2016) investigated the relationship between exports and economic growth for selected Sub-Saharan African countries; Botswana, Equatorial Guinea and Mauritius applying a new generation panel data paradigm in the period 1985-2014. Empirical results show that there is long term relationship between exports and economic growth, and the findings support export-led growth regime in the Sub-Saharan African countries. Kilinc-Savrul and Zeren (2013) analysed the export-led growth paradigm for 15 selected European countries using a panel hidden cointegration test in the period of 1970-2011. Long run relationship was found between exports and economic growth. Marin (1992) analysed the causality relationship between export, productivity, terms of trade and world output based on the cointegration and causality concept using data from selected developed countries (Germany, Japan, United Kingdom and United States) in the period from 1960 to 1987. The findings show that there is a causal link between exports and productivity in all four countries, and also there is causal link from terms of trade to productivity for The United States and United Kingdom. Parida and Sahoo (2007) tested the export-led growth and manufacturing export-led growth hypothesis for four South Asian countries using Pedroni's panel cointegration method from 1980 to 2002. These countries are Bangladesh, India, Pakistan and Sri Lanka. The paper investigated the effects of exports, and physical and human capital on both GDP and non-export GDP. The results are in the furtherance of export-led growth hypothesis. Agir, Sahbaz and Yanar (2014) studied 27 non-oil producing Asian countries including Turkey to test export-led growth hypothesis in the period 1994-2010. Authors set up two models using panel cointegration and panel causality analysis. Exports and gross fixed capital formation on GDP and non-export GDP for both models were analysed as in Parida and Sahoo's paper. As a result, it is found that there is a causal link from exports and gross fixed capital formation to GDP for both models. Mamun and Nath analysed the relationship between exports and economic growth for Bangladesh from 1976 to 2003 with quarterly data. Engle-Granger cointegration test, error correction model and Granger causality test was applied. According to results, there is a causal link from export to economic growth for Bangladesh.

Also, there are papers that have complicated results for other countries differently from studies that were mentioned above. These are Manap and Shirazi (2005), Gul and Kamaci (2012), Bahmani-Oskoei, Economidou and Goswami (2005), Agayev (2011),

Gokmenoglu, Sehnaz and Taspinar (2015), Henriques and Sadorsky (1996), Chand-Prasad et. al. (2007), Din (2004), Kumari and Malhotra (2016), Ramos (2001), Hsiao and Hsiao (2006), Jun (2007), and Gulmez and Yardimcioglu (2013). Manap and Shirazi (2005) examined the relationship between exports, imports and output growth using Granger causality test for Pakistan from 1960 to 2003. The results show that there is a strong a long-term relationship among these variables. Causality running from export to economic growth, and also bi-directional causality between import and output growth were found. Gul and Kamaci (2012) investigated causality relationship between export, import and economic growth using Pedroni cointegration and Granger causality test for developed and developing (including Turkey) countries over the periods of 1980-2010 and 1993-2010. According to the empirical test, there is causality relationship from exports and imports to economic growth in both developed and developing countries. Bahmani-Oskoe, Economidou and Goswami (2005) analysed the relationship between export and economic growth applying panel unit root test and panel cointegration method for 62 developing countries in the period of 1960-1999. In this paper, dependent variables were determined for both export and economic growth. When export was determined as dependent variable, a long run relationship was found between variables. However, when economic growth was determined as dependent variable, no relationship was found between the variables. The findings point out growth-led export regime. Agayev (2011) studied the relationship between export and economic growth for 12 members of former Soviet Union transition economies (Azerbaijan, Belarus, Armenia, Georgia, Kazakhstan, Kyrgyzstan, Moldavia, Russia, Ukrain, Tajikistan, Turkmenistan and Uzbekistan) using panel cointegration and panel causality methods from 1994 to 2008. Empirical findings show that there is causality relationship from economic growth to exports. Gokmenoglu, Sehnaz and Taspinar (2015) tested the causality relationship between exports and economic growth using Granger causality test and Johansen co-integration model for Costa Rica in the period of 1980-2013. The empirical results show that there is long run relationship between variables, and it highlights presence of causality from economic growth to exports for Costa Rica. Henriques and Sadorsky (1996) examined the export-led growth applying vector autoregression model and Granger causality test for Canada in the period of 1870-1991. Empirical results show that there was no presence of export-led growth hypothesis and growth-led export hypothesis was accepted. Chand-Prasad et. al. (2007) tested the export-led growth hypothesis for Papua New Guinea and Fiji. For

Papua New Guinea, the period covered from 1961 to 1999 and for Fiji from 1960 to 2001. Granger causality test and vector error correction model was used. According to the results, there is causal relationship from export and economic growth to import for Papua New Guinea in the long run whereas there is causality link from export and import to economic growth for Fiji. Also, in the short run, there is a bidirectional link between export and economic growth in Papua New Guinea. Din (2004) investigated the relationship between export, import and economic growth and tested export-led growth hypothesis applying Johansen Cointegrations Test, Granger Causality Test and Vector Error Correction Model for Bangladesh, India, Nepal, Pakistan and Sri Lanka. The period was between 1973 and 2002 for Pakistan and Bangladesh, and between 1960 and 2002 for Sri Lanka and India. For Nepal, it was from 1965 to 2002. The results show that there is bidirectional link between export and economic growth in India and Sri Lanka. While there is a causal link from economic growth to export and import India, it is found that the causal link from export and import to economic growth in Pakistan in the long run. However, there is no presence of export or import-led growth for Pakistan in the short run. In Nepal, the results indicate growth-led export and import-led growth. Kumari and Malhotra (2016) studied export-led hypothesis for Bangladesh, India, Pakistan and Sri Lanka from 1980 to 2012 applying Johansen cointegration test, VECM, IRF and variance decomposition analysis. According to results, export affected economic growth only in India. There is growth-led export for Bangladesh and also there is not any causal link for Pakistan and Sri Lanka. When compared to Din (2004), Kumari and Malhotra (2016) found results supporting particularly for Pakistan, Bangladesh and India, while it contrasts results for Sri Lanka. Ramos (2001) examined the causality relation between export, import and economic growth for Portugal using Granger causality test from 1865 to 1998. It was found that there is bidirectional causality between export and economic growth and also import and economic growth in Portugal. Hsiao and Hsiao (2006) analysed causality link between export, foreign direct investment, and economic growth for China, Hong Kong, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand applying time series, panel vector autoregressive model, and Granger causality test between 1986 and 2004. According to empirical results, foreign direct investment has unidirectional effects on GDP directly and also indirectly through exports, and there exists bidirectional causality between exports and GDP for the group. Jun (2007) analysed the relationship between foreign trade and economic growth for 81 countries in the period

from 1960 to 2003. Panel unit root and panel cointegration test were used. It was found there is bidirectional relationship between export and economic growth. Favourable relation between investment share and export, and unfavourable relation between labor and export were found. Gulmez and Yardimcioglu (2013) analysed the long run relationship between export and economic growth for six Turkish Republics from 1995 to 2011. The Pedroni, Kao and Johansen Fisher panel cointegration, Pedroni FMOLS; Pedroni DOLS, VECM and Canning; Pedroni Causality methods were used. According to results, there exist bidirectional relationship between export and GDP for these countries as expected.

### 1.3.1. Literature Table

The studies that were mentioned above are summarized as follows. While Table I shows the studies related to Turkey, Table II shows the studies related to other countries.

**Table 1.1.** *Literature related to Turkey on the relationship between export, import and economic growth*

Study	Data Set	Method	Findings
Deger et. al. (2013)	Turkey 1990-2008 (Monthly data) 1980-2007 (Annual data)	Feder Model, and Toda-Yamamoto Causality Test	Import dependency of export and import-led growth are valid.
Camurdan (2013)	Turkey 1999Q2-2013Q1	Johansen Cointegration Test and Granger Causality Test	Import dependency of export, export-led growth and import-led growth are valid.
Rençber and Tuncsiper (2017)	Turkey 2002Q1-2016Q2	Granger Causality Test	Import dependency of export and import-led growth are valid.
Acet, Erdogan and Koksall (2016)	Turkey 1998-2013	Granger Causality Test	Import dependency of export and import-led growth are valid.
Aydin and Yurdakul (2018)	Turkey 2003Q1-2016Q1 2008Q1-2016Q1	Engle-Granger, Johansen and Dynamic Least Squares Methods	Import dependency of export, import-led growth according to real values and export-led growth according to nominal values are valid.
Tuncer (2002)	Turkey 1980Q1-2000Q4	Toda-Yamamoto and Granger Causality Test	Import dependency of export, growth-led export, growth-led import and import-led growth are valid.

**Table 1.1. (Continued)** *Literature related to Turkey on the relationship between export, import and economic growth*

Ciftci, Kucukaksoy and Ozbek (2015)	Turkey 2003Q1-2015Q1	Canonical Cointegrating Regression, Dynamic Ordinary Least Squares, Fully Modified Ordinary Least Squares, Gregory-Hansen Cointegration Test, Johansen Cointegration and Toda-Yamamoto Test	Import dependency of export and export-led growth are valid.
Dereli (2018)	Turkey 1969-2016	Johansen Cointegration, Granger Causality and Vector Error Correction Granger Causality Test	Import dependency of export and import-led growth are valid.
Berber and Kurt (2008)	Turkey 1989Q1-2003Q4	Vector Autoregression, Variance Decompositions and Granger Causality Test	Import dependency of export and export-led growth are valid. Also, there are the bidirectional link between import and growth.
Akbas and Senturk (2013)	Turkey and 16 selected countries 1990M1-2012M9	Hatemi-J Test	Import dependency of export is valid.
Ugur (2008)	Turkey 1994Q1-2005Q4	Multivariate Vector Autoregression Analysis and Granger Causality Test	Bidirectional link between GDP and investment goods imports and raw materials import.
Baday-Yildiz and Berber (2011)	Turkey 1989Q1-2007Q3	Cointegration Analysis and Vector Correction Model	Import-led growth is valid.
Demirhan (2005)	Turkey 1990Q1-2004Q1	Vector Error Correction Model and Cointegration Analysis	Import-led growth and growth-led import/export are valid.
Illickan-Ozgur (2015)	Turkey 1980Q1-2014Q4	Granger Causality Test and ARDL Bound Test	Import-led growth and growth-led import for both short and long run are valid. Growth-led export is valid for only long run.
Uysal and Yardimci (2007)	Turkey 1998-2002	Johansen and Pesaran's Bound Test	According to Johansen test results, import variable is the more effective on economic growth than the other variables.

**Table 1.1. (Continued)** *Literature related to Turkey on the relationship between export, import and economic growth*

Aktas-Senkardesler (2018)	Turkey 1980Q1-2016Q2	Johansen Cointegration Test, Vector Error Correction Model, and Granger Causality Test	There is bi-directional relationship between import and economic growth in the long run. For short run, import-led growth is valid.
Ozcan and Ozcelebi (2013)	Turkey 2005M1-2011M11	Vector Error Correction and Johansen Cointegration Method	Export-led growth is valid.
Erdogan and Ozer (2006)	Turkey 1987Q1-2006Q2	Vector Autoregression Model and Granger Causality Test	Export dependency of import and export-led growth are valid.
Simsek (2003)	Turkey 1960-2002	Error Correction Model and Granger Causality Test	Growth-led export is valid.
Takim (2010)	Turkey 1975-2008	Granger Causality Test	Growth-led export is valid.
Karabulut (2018)	Turkey 1970-2016	Vector Autoregressive Model and Granger Causality Test	Growth-led export is valid.
Aktar and Taban (2008)	Turkey 1980Q1-2007Q2	Cointegration, Error Correction Model and Granger Causality Test	Export-led growth and growth-led export are valid.
Tirasoglu (2012)	Turkey 1998Q1-2011Q4	Unit Root, Cointegration, Causality and Structural Break Test	Export-led growth and growth-led export are valid.
Sarac (2013)	Turkey 1989Q2-2011Q4	Nonlinear Econometric Technique	Export and import affect economic growth together.
Acaroglu, Beser and Dura (2017)	Turkey 1992-2014	Nonlinear Causality and Dicks and Panchenko Test	Export-led growth is valid.

**Table 1.2.** *Literature related to other countries on the relationship between export, import and economic growth*

<b>Study</b>	<b>Data Set</b>	<b>Method</b>	<b>Findings</b>
Alam (2003)	Brazil 1955-1990 Mexico 1959-1990	Johansen and Fully Modified Ordinary Least Squares Methods	Import-led growth is valid for two countries.
Katircioglu and Katircioglu (2011)	North Cyprus 1977-2008	Johansen Cointegration and Granger Causality Test	There is long run relationship between import and economic growth and its economy depends on import from abroad. However, import-led growth is not valid.

**Table 1.2. (Continued)** *Literature related to other countries on the relationship between export, import and economic growth*

Bayat et. al. (2015)	Brazil, China, India 1997-2013 South Africa, Turkey 1993-2013 Russia 1996-2013	Frequency Domain Causality	For Turkey, Brazil, China and Russia export-led growth, for South Africa and India import-led growth is valid. For all countries import dependency of export is valid.
Barisik and Cetintas (2009)	13 Transition Economies 1995Q2-2006Q4	Panel Causality and Panel Cointegration Test	Growth-led export is valid for these economies.
Mody and Yilmaz (2001)	14 Developed Countries 25 Developing Countries 1967-1990	Cross-Sectional Horizontal Analysis	There are significant and positive link between imports of foreign investment goods and export competitiveness. It shows that imported machinery lead to reduce cost in developed and export-led countries.
Rajaguru and Thangavelu (2004)	9 Rapidly Asian Countries 1960-1996	A Multivariate Vector Autoregression Analysis, Granger Causality Test and Vector Error Correction Model	Import ensures significant relationship between trade and output growth. Import led productivity growth is found Indonesia, Malaysia, India, Taiwan, Philippines and Singapore. Export-led growth is valid only Singapore in the long run.
Lawrence and Weinstein (1999)	Japan and Korea 1963-1983	Time Series Analysis	There is significant and positive link between import and productivity in both countries.
Awokuse (2003)	Canada 1961-2000	Granger Causality Test, Vector Autoregressive developed by Toda-Yamamoto and Vector Error Correction Models	Export-led growth is valid.
Abou-Statit (2004)	Egypt 1977-2003	Vector Autoregression, Impulse Response Function Analysis and Granger Causality Test	Export-led growth is valid.
Biyase and Zwane (2011)	30 African Countries 1990-2005	5 Panel Data Models	Export-led growth is valid for these African countries.
Ee (2016)	Botswana, Equatorial Guinea and Mauritius 1958-2014	A New Generation Panel Data Models	Export-led growth is valid in these countries.

**Table 1.2. (Continued)** *Literature related to other countries on the relationship between export, import and economic growth*

Kilinc-Savrul and Zeren (2013)	15 Selected European Countries 1970-2011	Panel Hidden Cointegration Test	There is long run relationship between export and economic growth in all countries.
Marin (1992)	Germany, Japan, United Kingdom and United States 1960Q1-1987Q2	Cointegration and Granger Causality Tests	There is link between exports and productivity in all countries. Also, there are link from terms of trade to productivity for The United States and United Kingdom.
Parida and Sahoo (2007)	Bangladesh, India, Pakistan and Sri-Lanka 1980-2002	Pedroni's Panel Cointegration Model	Export-led growth is valid in these economies.
Agir, Sahbaz and Yanar (2014)	27 Non-oil Producing Asian Countries 1994-2010	Panel Cointegration and Panel Causality Tests	Export-led growth is valid in these countries.
Mamun and Nath (2005)	Bangladesh 1976Q1-2003Q3	Engle-Granger Cointegration Test, Error Correction Model and Granger Causality Test	Export-led growth is valid.
Manap and Shirazi (2005)	Pakistan 1960-2003	Cointegration and Multivariate Granger Causality Test	Export-led growth, import-led growth and growth-led import is valid.
Gul and Kamaci (2012)	12 Developed Countries 1980-2010 7 Developing Countries 1993-2010	Panel Data Analysis and Granger Causality Test	Export-led and import-led growth is valid for these countries.
Bahmani-Oskoe, Economidou and Goswami (2005)	61 Developing Countries 1960-1999	Panel Data Analysis and Granger Causality Test	Growth-led export is valid.
Agayev (2011)	12 Members of former Soviet Union Transition Economies 1994-2008	Panel Cointegration and Granger Causality Tests	Growth-led export is valid for 12 transition economies.
Gokmenoglu, Sehnaz and Taspinar (2015)	Costa Rica 1980-2013	Granger causality and Johansen cointegration tests	Growth-led export is valid.
Henriques and Sadorsky (1996)	Canada 1870-1991	Vector Autoregression Model and Granger Causality Test	Growth-led export is valid.
Chand-Prasan et. al. (2007)	Fiji 1960-2001 Papua New Guinea 1961-1999	Granger causality test and vector error correction model	There are both export-led and import-led growth for Fiji. There is export-led growth for Papua New Guinea.

**Table 1.2. (Continued)** *Literature related to other countries on the relationship between export, import and economic growth*

Din (2004)	Nepal 1965-2002 Bangladesh, Pakistan 1973-2002 India, Sri Lanka 1960-2002	Johansen cointegration test, Granger causality, test and Vector error correction model	The results show that in Bangladesh growth-led export and import hypothesis, in Pakistan export-led growth, in Nepal growth-led export and import-led growth hypothesis are valid. In India and Sri Lanka, there are bi-directional causal link between export and economic growth.
Kumari and Malhotra (2016)	Banglades, India, Pakistan, and Sri Lanka 1980-2002	Johansen Cointegration Test, Vector Error Correction Model, Impulse Response Function, Variance Decomposition Analysis	Export affected positively GDP just in India. Growth-led export is valid in Bangladesh.
Ramos (2001)	Portugal 1865-1998	Cointegrating Analysis and Granger Causality Test	Export-led growth is valid.
Hsiao and Hsiao (2006)	8 Rapidly Developing Asian Countries 1986-2004	Granger Causality Test, Time Series and Panel Data Analysis	FDI has unidirectional effects on GDP directly and also indirectly through exports. Export-led growth and growth-led export is valid for the group.
Jun (2007)	81 Developed and Developing Countries 1960-2003	Panel Cointegration Test	Export-led growth and growth-led export is valid. Also, favourable link between investment share and export, and unfavourable link between labor and export is found.
Gulmez and Yardimcioglu (2013)	6 Turkish Republic Countries 1995-2011	Pedroni's Panel Cointegration Methods	Export-led growth and growth-led export is valid.

There are many studies in the literature analysing the causal relationship between foreign trade and economic growth. Many of these studies have been explained and summarized as tabular. The authors examined the relationship between the variables generally using Granger causality test, cointegration and error correction models and obtained different results such as export-led growth, import-led growth, and import dependency of export etc...

Turkey's economic history which includes import substitution and export orientation period has been explicated with macroeconomic indicators in second section.

## **CHAPTER TWO**

### **2. A GENERAL OVERVIEW ON TURKISH ECONOMY: HISTORICAL FRAME WITH MACROECONOMIC INDICATORS**

Countries have aimed to provide economic growth due to foreign trade throughout the economic history. Countries have generally applied two different policies to ensure economic growth. These are import substitution industrialization (ISI) policy and export-oriented industrialisation. From the perspective of Turkey, Turkey applied different economic models by considering both the world economy and their economic conditions.

Turkish economy is divided into two historical periods depending on the relationship between economic growth and foreign trade in this section. The first is the pre-1980 period import substitution growth and the second one is the post 1980 period outward oriented growth.

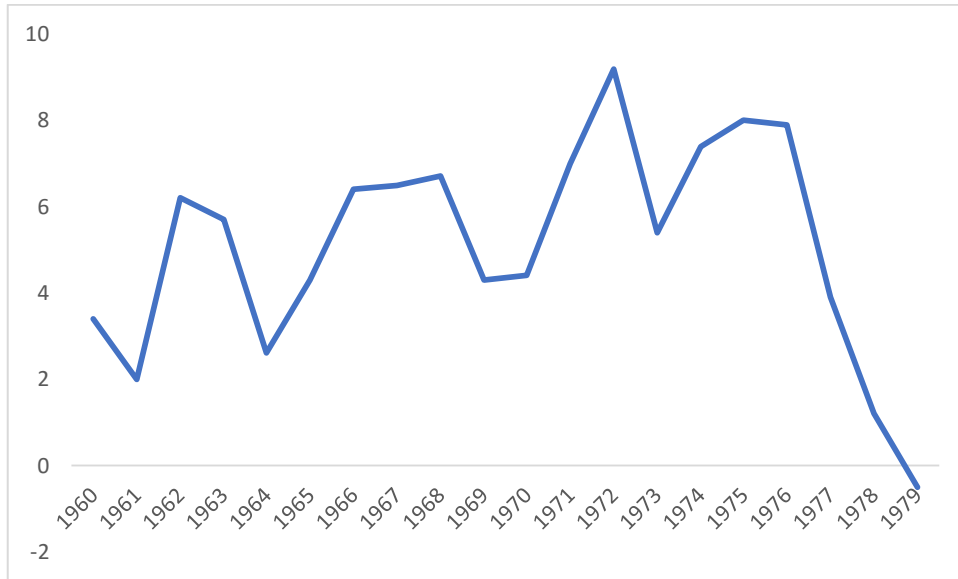
#### **2.1. The Pre-1980 Period: Import Substitution Growth**

In almost all developing, and less developed countries, initial phases of industrialization are marked by import substitution strategy. The acceptance of this strategy is explained by the position of Third World governments in the international system or by domestic political elements. Import substitution includes prevention to more capital-intensive goods supporting suppliers of capital and human capital (Maxfield and Nolt, 1990; Amelug, 1988). This strategy is characterized by strong controls on local prices, high protection from import, pressured financial system, hegemony state owned establishment in banking and what were accepted as crucial industries. Import substitution growth was applied as main strategy from the 1960s to 1980 in Turkey (Atiyas and Bakis, 2014).

Import substitution policies developed Turkey's resource base. A state interventionism that was developed throughout the 1960s radically altered the resource base by producing intermediate inputs at subsidized values and protecting the domestic prices of the imported goods under their world price balance. Import substitution was aimed at creating new sources of export revenue, altering the agricultural form of the economy, and founding a self-sufficient economy (Nas, 2008).

The 1960s began with a decision to fix the faults of the previous regime. The goal was to accelerate economic development by import substitution and central planning which reevaluated the role of the government in the economy in the 1960s. Import substitution policy was institutionalized through central planning (Bayar, 1996).

Basic macroeconomics data for Turkey's import substitution period are shown as follows.

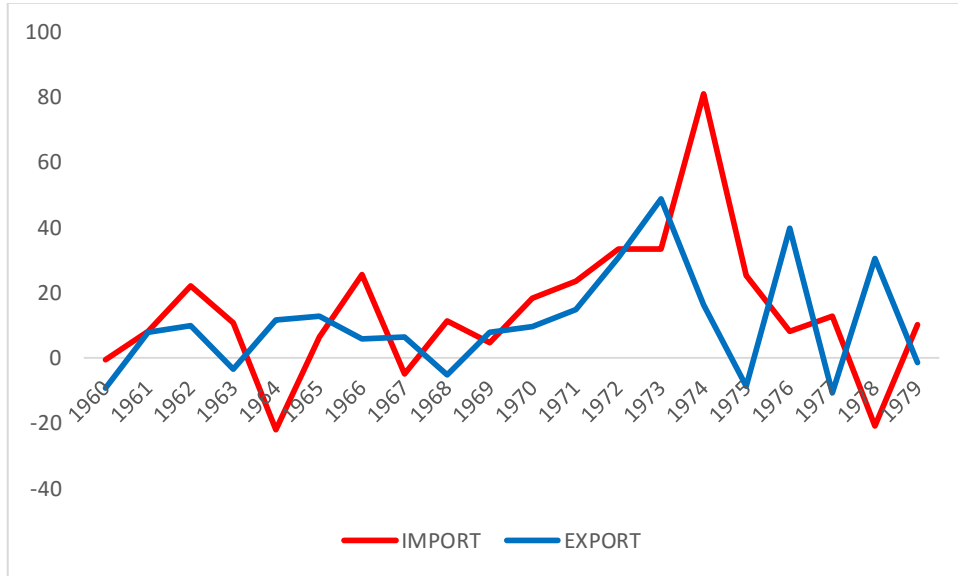


**Figure 2.1.** Turkey's growth rate in 1960s (%)

**Source:** <http://www.tuik.gov.tr> [accessed 25.02.2019]

**Note:** The figure was prepared by author.

When it is looked over the import substitution period, it is seen that growth rate followed a fluctuating course. While the highest growth rate is achieved in 1972, the growth rate began to decline because of the petroleum crisis after 1973 and 1976.

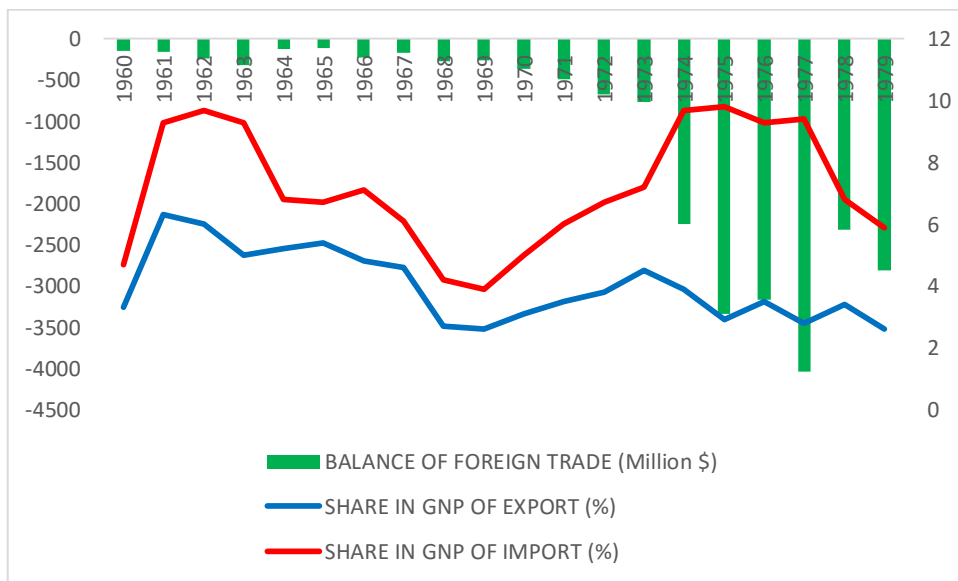


**Figure 2.2.** Rate of change in Turkey's foreign trade in 1960s (%)

Source: <http://www.tuik.gov.tr> [accessed 24.04.2019]

Note: The figure was prepared by author.

The most important of feature about Turkey's foreign trade is that import is always more than export. Even though import exceeds export every year in this period, import declined more than expected, and export raised. So, change in export exceed change in import in some years.

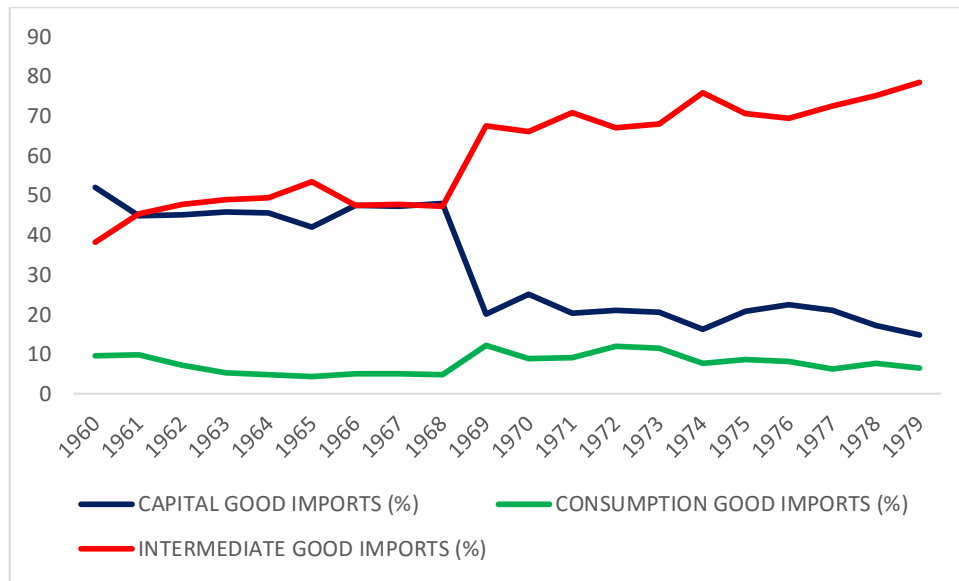


**Figure 2.3.** Turkey's balance of foreign trade and share in GNP of exports and imports in 1960s

Source: <http://www.tuik.gov.tr> [accessed 24.04.2019].

**Note:** *The figure was prepared by author*

The balance of foreign trade had a deficit during the period. While the balance of foreign trade was 147 thousand dollars in beginning of period, it increased almost twenty times in end of the period. Since ratio in GNP of imports had a serious share, it can be admissible reason of the deficit.



**Figure 2.4.** *Turkey's import share in total by classification of Broad Economic Categories (BEC) in 1960s*

**Source:** <http://www.tuik.gov.tr> [accessed 24.04.2019].

**Note:** *The figure was prepared by author*

While imported capital and intermediate good had almost same share in total import until the first half of the import substitution period, the share of imported intermediate goods in total import increased significantly, and the share of imported capital goods declined suddenly. Imported consumption goods have kept up its share in total import.

### **2.1.1. Planned economy era**

Five-year development plans were prepared and implemented by State Planning Organization (SPO). Three development plans were implemented until 1980. These are First Five-Year Development Plan (IFYDP) (1963-1967), Second Five-Year Development Plan (IIFYDP) (1968-1972), and Third Five-Year Development Plan (IIIFYDP) (1973-1977) (<http-1>).

The introduction of the IFYDP indicated the institutionalization of the import substituting industrialization strategy in Turkey (Onis, 1992). It was expected that political and social crises that Turkey had faced could be avoided with development planning structure. Distribution of income would be fairer (Kepenek, 2011).

The economic planning began in the 1960s. The common and main characteristics of the plans can be summarized. Firstly, plans were obligatory for the public sector and directive for the private entrepreneurs. While plan targets had already set for private sectors, the public sector had to follow instructions from the government. Secondly, the main goal of all the plans was a rate of growth in the economy which was hoped to be at least 7% per year initially. It was expected that the high level of economic growth rate could bring in quality change, which was reaching the whole development process. Thirdly, common target was industrialisation. Plans had highlighted the necessity for more industrialisation. Since the agricultural labour force was 77% of the total, IFYDP committed balanced sectoral development between industry and agriculture, although it had the highest rate of growth. Domestic manufacturing was supported and protected. Import duties of intermediate goods and raw materials used in manufacture sector were reduced. Premiums to exports and tax exemption were provided. However, foreign and export competition policies were not considered. Providing the highest growth goal of all sectors, some propositions were made. These were making industry the leading sector (IFYDP), producing intermediate and machinery goods (IIFYDP) (Kepenek, 2011).

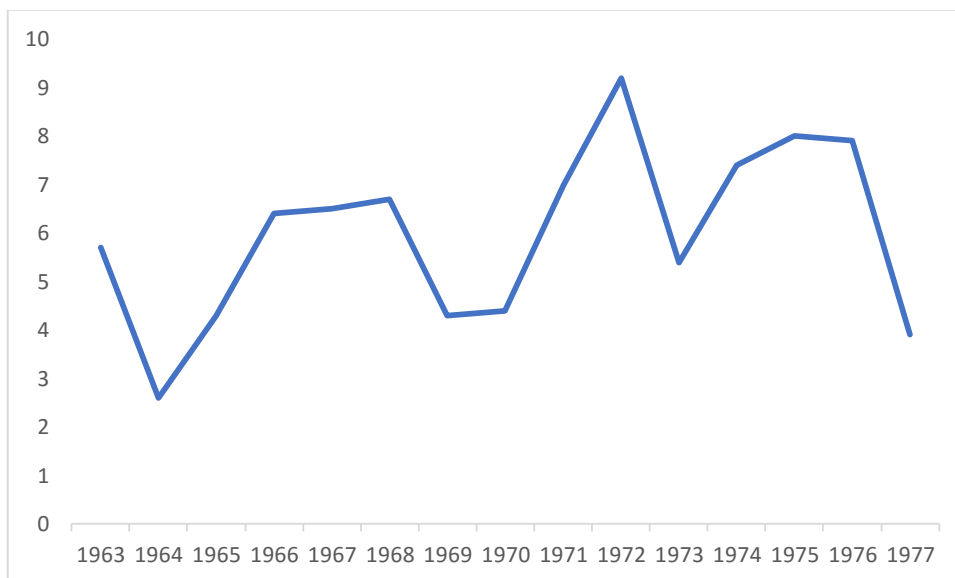
IFYDP's targets were that to provide growth rate of 7% per year and to make agricultural sector should be 4.2, manufacturing sector 12.9, energy sector 13, mining sector 9.3, transportation 10.5 percent ; to rise the qualified human resources, engineers, technicians and scientists for needed development; to accomplish the foreign payment balance; to find solutions to the unemployment problem and to achieve social equity (Kepenek, 2011). A target of 7% for growth rate was almost reached (around 6.7%). However individual sectors deviated from the plan. While manufacturing and agricultural output raised just about three- quarters, the service and construction industries exceeded the planned rate. New investment and techniques in agriculture sector could not be fast as expected. Public revenue could not be raised as much as planned. Despite these deficiencies, substantial progress was achieved throughout IFYDP without inflationary pressures and other unbalances (Snyder, 1969).

IIFYDP clarified the concepts of import substitution strategies compared to first plan. As domestic production expanded, import quotas became increasingly restrictive (Amelug, 1988). The targets of second plans were average growth of 7% per year; increasing to gross national product (GNP) 40,3%; to change the general structure of the economy from agriculture to the sector leading by industry, to increase the rate of development of the country with its own resources without external aid and improving the standard of living in society (Eren, 2011). The industrial sector planned at the second plan had been able to satisfy only the domestic market demand but had not been able to compete in international markets. For this reason, exports which were main target, and imported products produced in the domestic market via import substitution had not been fully realized (Sayar, 2001).

A new long run perspective was prepared with third five-year development plan. A new development strategy for 22 years had been implemented. The new development strategy covered the period of 1973-1995 since Turkey aimed to be part of the customs union membership of European Economic Community, which was the origin of today's European Union (EU). The main target of the third plan was a faster industrialisation by the accomplishment of the third stage of the ISI. So, it became more important to produce investment, intermediate goods, machinery and equipment domestically. As incentives for the private sector would be raises, the public sector would play a predominant role in the ISI duration (Kepenek, 2011).

The targets of the third plan were to provide average growth rate of 7.9% per year, the industry saving rates of 11.2% per year. An increase around 40% was aimed in industry share in GNP and a decrease share of agricultural income around 10%. In addition, the ratio of employees in the industrial sector to total employees should reach from 11% to 22%, and the share of employees in agriculture should decrease from 60% to 20% (Kepenek, 2011).

Data about all three of the plans are summarized with figures and tables. Turkey's growth rates for all three plans are as follows.



**Figure 2.5.** Turkey's growth rate the period between 1963 and 1977

**Source:** <http://www.tuik.gov.tr> [accessed 25.02.2019].

**Note:** The figure was prepared by author.

As shown in the figure 2.1., the targeted growth rate of 7% for the first plan was realized as 6.5% at the end of the period. When it is looked second plan period, targeted growth rate was realized in 1971 and 1972, and was almost realized in 1968. However, the targeted growth rate was realized less for 1969 and 1970. For the third plan, it can be said that the targeted growth rate of 7,9% could not realized, except in 1976.

Planned and realised growth rates for GNP, agricultural and industry for all three plans are as follows.

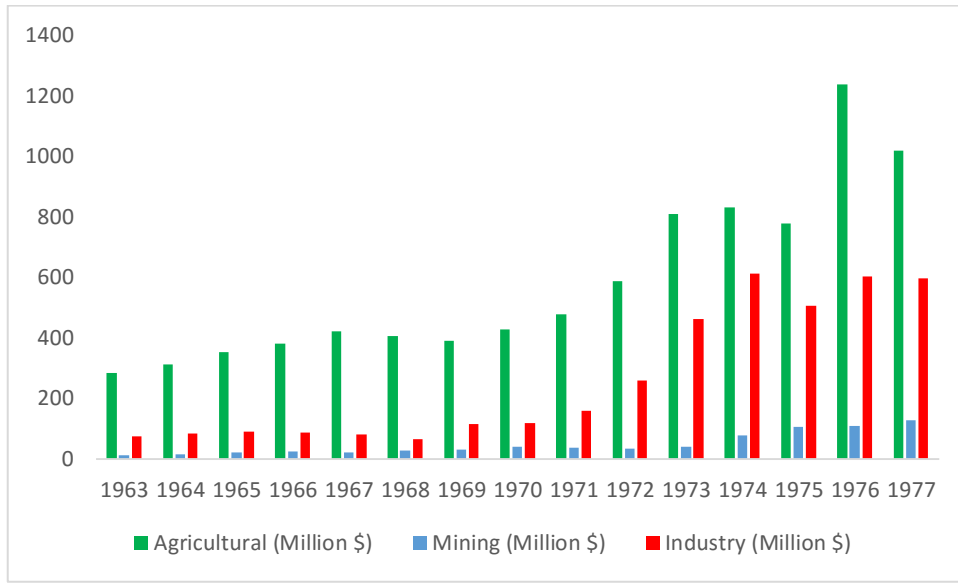
**Table 2.1.** Growth Rates: Planned and Realised (Kepenek, 2011)

Periods	GNP		Agricultural		Industry	
	P	R	P	R	P	R
1963-1967	7	6.6	4.2	3	12.3	10.9
1968-1972	7	6.3	4.1	1.8	12	9.1
1973-1977	7.9	5.2	3.7	1.2	11.2	8.8

In table 2.1., growth rate in GNP, agriculture and industry can be seen. Planned growth rate in GNP was almost realised for both first and second plan but realised growth

rate in GNP was less than planned one in the third plan period. While the targeted growth rate for agriculture and industry was almost realized in the period of the first plan, the planned growth rate for both sectors could not be realized in the period of the second and the third plan period.

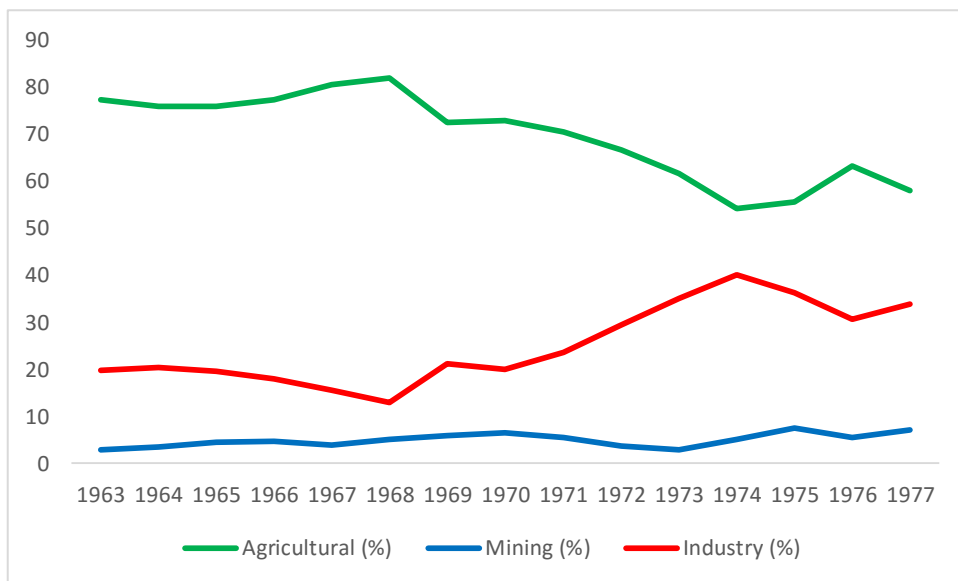
Sectoral distributions of exports for all three plans are as follows.



**Figure 2.6.** Sectoral distribution of exports in the period 1963-1977

Source: <http://www.tuik.gov.tr> [accessed 04.04.2019].

Note: The figure was prepared by author.



**Figure 2.7.** The share of sectoral distribution of exports in the period 1963-1977

Source: <http://www.tuik.gov.tr> [accessed 04.04.2019].

Note: The figure was prepared by author.

When the figures above are examined, the share of agricultural sector was highest for all three plans. The share of agricultural sector could not be decreased, and the share of industry sector could not be increased in the period of IFYDP. While agricultural and mining export increased, targeted increase was not realized in industry export. However, the share of industry sector and industry export increased in the period of IIFYDP. When it is looked the period of IIIFYDP, it can be seen that increase in industry and mining sector export.

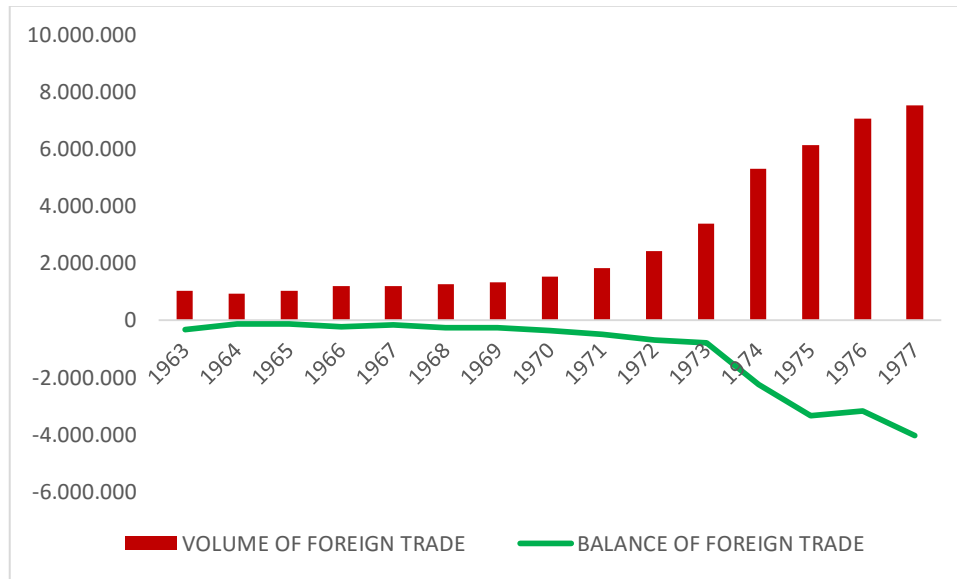
Turkey's foreign trade statistics for all three plans are as follows.



Figure 2.8. Turkey's foreign trade statistics in the period between 1963 and 1977 (Thousand \$)

Source: <https://www.tuik.gov.tr> [accessed 25.02.2019].

Note: The figure was prepared by author.



**Figure 2.9.** Turkey's balance and volume of foreign trade in the period 1963-1977  
(Thousand \$)

**Source:** <https://www.tuik.gov.tr> [accessed 25.02.2019].

**Note:** The figure was prepared by author.

When the figures above are examined, foreign trade deficit continued for all three plans. So, export was less than import in the period of 1963-1977. Proportion of imports covered by exports almost always showed a falling tendency. The reason why import was more than export can associate to ISI process did not productiveness the expected feedback. So, it can be said that the 1963-1970 period was a positive import substitution, and the 1970-1977 period was a negative import substitution because of high current account deficit (Cecen, Dogruel, and Dogruel, 1994).

The upward trend in imported inputs led to a worsening of the balance of payments. The foreign exchange required to meet the increasing imports depends on the foreign exchange earned from the exports of traditional products. The products produced by the industry sector were for the domestic market not for exports. So, national industry could not earn the needed foreign exchange (Baskaya, 1994). Turkey produced intensively intermediate goods and domestic substitution of basic industry in this period. Although restrictive policies were implemented to protect in-country production, the economy was dragged on a foreign currency financing crisis starting from 1977 (Yeldan, 2006).

Sources of investment in the all three plans are as follows.

**Table 2.2. Sources of Investments in the First Three Plans**

As Percent of GDP	IFYDP		IIFYDP		IIIFYDP	
	Planned	Realised	Planned	Realised	Planned	Realised
<b>Constant Capital Investments</b>						
<b>Total</b>	18.3	16.0	21.3	16.1	21.9	20.2
<b>Domestic</b>	14.8	14.2	19.4	15.5	21.1	16.0
<b>Foreign</b>	3.5	1.8	1.9	0.6	0.8	4.2

Source: <http://www.sbb.gov.tr> [accessed 04.04.2019].

In order to achieve a growth rate of 7%, the share of total investments in GNP was expected to be 18.3%. Of total investments, 14.8% were aimed to be obtained from domestic resources and 3.5% from foreign resources. Domestic resources approached the target, but foreign resources could not approach the target for IFYDP. When the period of IIFYDP is examined, the planned investment rate was less than realised. For IIIFYDP, it can be said that the planned total investment was almost realised. However, planned domestic and foreign investment was not as it should be. Domestic sources were not enough, so investment depended on foreign resources.

When it is continued to examine the period of import substitution, the import substitution strategy was useful for several industries, especially intermediate and consumer goods and focused on iron and steel, metals, chemical, and transportation equipment industries. In industries such as textiles, food, and petrochemicals, exports were also realized apart from imports. Despite import-substitution policies, the import of some goods, such as iron and steel, electronic equipment, machinery, steadily raised over the years. The reason for the increase in import of these goods can be explained both because of the size of these industries which could not grow enough to acquit domestic needed and because of the capital input needed of the import substitution industries. Because of developing industry, the need for imports rose and then import plan became more restrictive and increasingly dependency on foreign currency (Nas, 2008).

Import substitution strategies were applied without serious foreign-currency and imported-input restrictions throughout the period 1963-1970. Turkey was able to improve from the production of consumption goods to the production of intermediate goods despite deficiency of imported inputs and reasonable foreign exchange availability.

However, after 1970, import substitution became intensified at the consumer commodities level because of devaluation of the Turkish lira. The domestic market was more attractive for consumer commodities and imported inputs demand began to increase (Nas, 2008).

On the other hand, energy became more expensive, so imported input price increased with the oil crises in 1973-1974. However, Turkey delayed the needed internal adjustment to the external shocks. Thus, it led to distortion in the economy. After 1976, an overvalued Turkish lira raised the demand imported goods, so the demand raised for more foreign currency. Thus, trade deficit increased, which led to production bottlenecks and deficiency of essential good and this caused to high inflation and debt crisis in 1977. Since rising oil prices again continued to shock the economy, the conditions got worse in 1979 (Nas, 2008).

In view of changing economic conditions at home and abroad by the end of the 1970s, import substitution strategies were no longer sustainable. Finally, the all the situations in this period led to implementing a new program in 1980, which was structural and stabilization adjustment program (Nas, 2008).

## **2.2. The Post 1980 Period: Outward Oriented Growth**

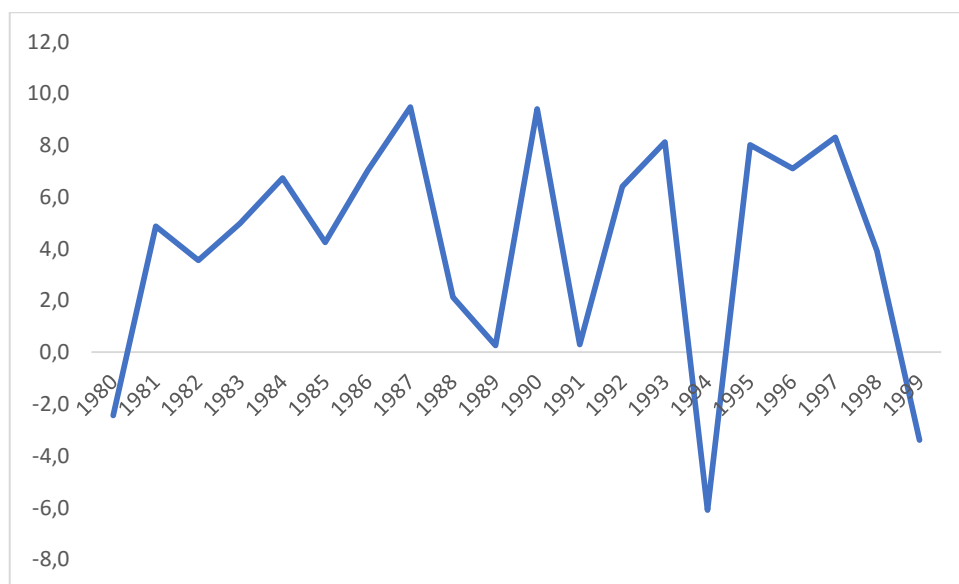
Prior to 1980, Turkey implemented an economic strategy based on the import substitution. The strategy was characterised by important restrictions. It was planned support manufacture of goods in the country for providing domestic demand substituted for imports (Ozer, 2003; Ozturk, 2003). However, this strategy did not continue as planned. With the petroleum crisis end of the 1970s, Turkey experienced severe foreign exchange shortages (Deger, et al., 2013). By the end of the 1970s, it was certain that Turkey needed a new strategy (Bayar, 1996).

The year 1980 was a turning point for Turkey's political economy. A main reform program of economic liberalisation was presented for shifting the economy's centre of emphasis from the public to the private sector, giving ideal liberty to the market with the military regime began by the coup of September 1980. Turkey met a new era of outward economic growth (Cecen, Dogruel, and Dogruel, 1994; Bayar, 1996).

By the end of the 1970s, because of high inflation and expanding balance of payments deficit, it had become urgent for altering import substitution strategy with the

24 January 1980 decisions and standby agreement with the International Monetary Fund (IMF). Therefore, in the 1980s Turkey witnessed a fundamental transformation in the economic policy strategy from import substitution to trade liberalization. With these decisions, development strategy of Turkey changed and transformed the outward orientation strategy, which was export-led growth strategy (Deger, et al., 2013; Atiyas and Bakis, 2014).

Basic macroeconomics data for Turkey's in outward oriented period are shown as follows.

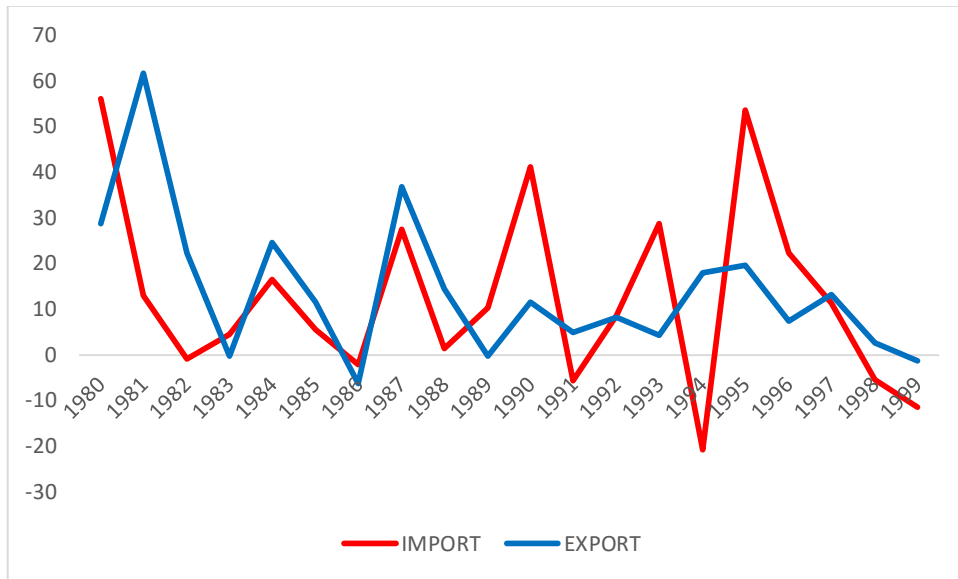


**Figure 2.10.** Turkey's growth rate in the period of 1980s (%)

**Source:** <http://www.tuik.gov.tr> [accessed 25.02.2019].

**Note:** The figure was prepared by author.

When figure 2.10. is examined, it can be seen that a positive growth was maintained. Even though a positive growth continued in the later years, because of the crises growth rate was on the decline.

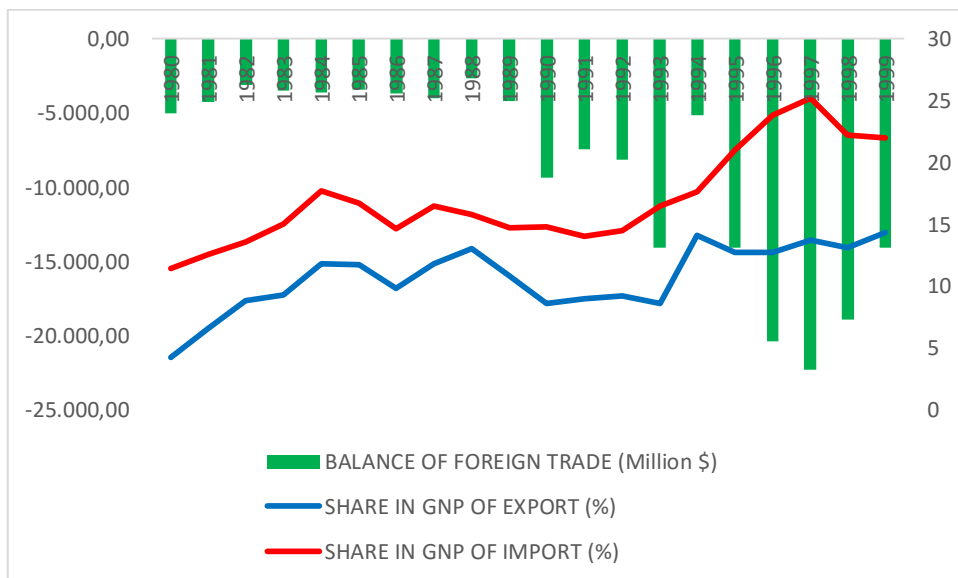


**Figure 2.11.** Rate of change in Turkey's foreign trade (%)

Source: <http://www.tuik.gov.tr> [accessed 24.04.2019].

Note: The figure was prepared by author.

Due to new economic policy, export improved significantly since 1980 but export showed a falling tendency because of the revaluation of Turkish Lira, and consequently import raised in beginning of 1990s. However, it was shrunk in import since the government devalued its currency.

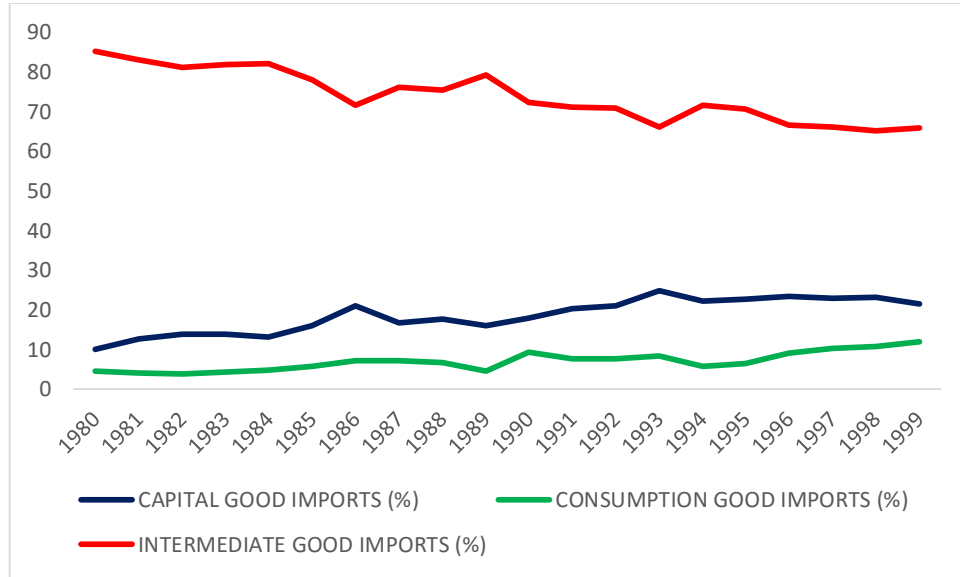


**Figure 2.12.** Turkey's balance of foreign trade and share in GNP of exports and imports 1980s

Source: <http://www.tuik.gov.tr> [accessed 24.04.2019].

**Note:** The figure was prepared by author.

Much as export raised in this period, balance of foreign trade deteriorated since import also increased. The balance of foreign trade had a deficit during this period, too. However, foreign trade deficit started to decrease after 1997.



**Figure 2.13.** Turkey's import share in total by classification of BEC in 1980s

**Source:** <http://www.tuik.gov.tr> [accessed 24.04.2019].

**Note:** The figure was prepared by author.

Compared to the import substitution period, it is seen that share of imported intermediate goods in total import increased in outward oriented period. While imported consumption goods showed decrease, imported consumption goods have kept up its share.

### 2.2.1. 24<sup>th</sup> January decisions

Debt crisis that convulsed most of the third world countries also pushed the Turkish economy to make a stabilization program based on export-led growth. The structural adjustment program demonstrated basic break with the import substitution strategy of the pre-1980 period. Thus, the stabilization and structural adjustment program was prepared and implemented as 24 January Decisions. According to this, the system of import substitution was changed and applied outward oriented policy instead of the former policy. IMF and World Bank (WB) supported the program (Onis, 1992; Cecen, Dogruel, and Dogruel, 1994; Ozturk, 2003).

The program which had the characteristic of both orthodox and heterodox stabilization programs had long and short run objectives. To solve foreign debt payments, increase development progress and decrease inflation speed were the target of short run. Also, it was aimed that limit public sector's scope and restricted the intervention to markets (Karluk and Kucuksakarya, 2016). The targets of 24 January decisions were:

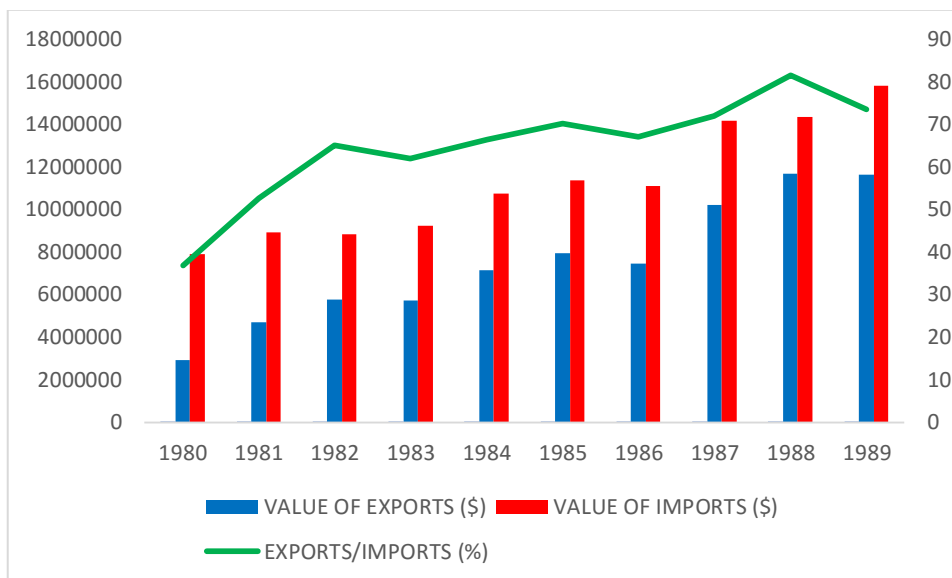
- Integration of Turkish economy to global economy,
- Benefiting of market economy,
- Price mechanism validation,
- Decreasing of state intervention in economy,
- Raising of the effect of free market powers,
- Giving encouragement to exports and foreign capital,
- Devaluation of Turkish lira,
- Liberalization of interest rates,
- Transition to daily exchange rate,
- Being free of imports (Boratav, 2014; Karluk, 2014).

With the 24 January decisions, the liberalization and integration to global economy process began in Turkey. Turkey's political economy transformed from import substitution orientation to more open regime (Bayar, 1996).

As a result of the 24 January Decisions:

- Export developed and the share of industrial goods in exports increased.
- Balance of payments deficit decreased, and foreign exchange bottleneck expanded.
- Foreign capital increased.
- Quantity controls on imports were removed. Customs tariffs were reduced.
- Import was increased with loans providing international markets.
- Foreign trade deficit increased because of increasing imports.
- GDP declined in 1980 but it began to raise again after 1981.
- Inflation started to decline (Boratav, 2014; Karluk and Kucuksakarya, 2016).

Turkish economy's macroeconomic indicators in 1980's are shown in figure 2.14..

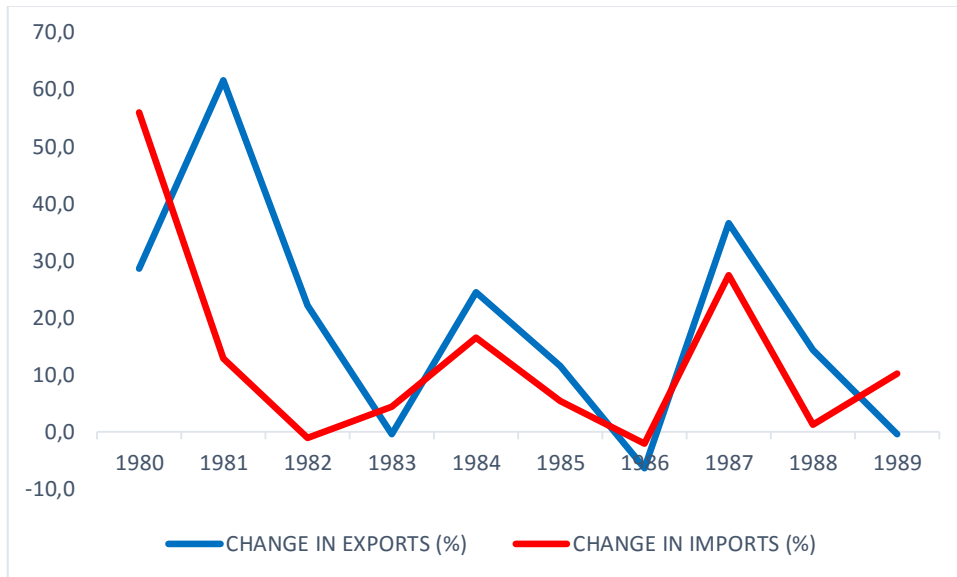


**Figure 2.14.** Turkey's foreign trade statistics in 1980's

**Source:** <https://www.tuik.gov.tr> [accessed 25.02.2019].

**Note:** The figure was prepared by author.

As can be seen in figure 2.14., exports decreased in some years, but it has shown a steady upward trend. One of the most important factors in increasing exports is financial incentives. Developments in exports were achieved through better utilization of existing capacity in the 1980s. After 1988, increasing export slackened because of the disappearance of positive effects. Import showed upward trend and proportion of imports covered by exports increased except some years. Increasing import arose from foreign dependent structure of economy. As investment and intermediate goods industries were unable to reach the desired level of import substitution, imports of these goods continued to increase. Also, the liberalization of the import regime was influenced in the growth of imports (Sahin, 2000). Change in exports and imports year to year is as shown in Figure 2.15..

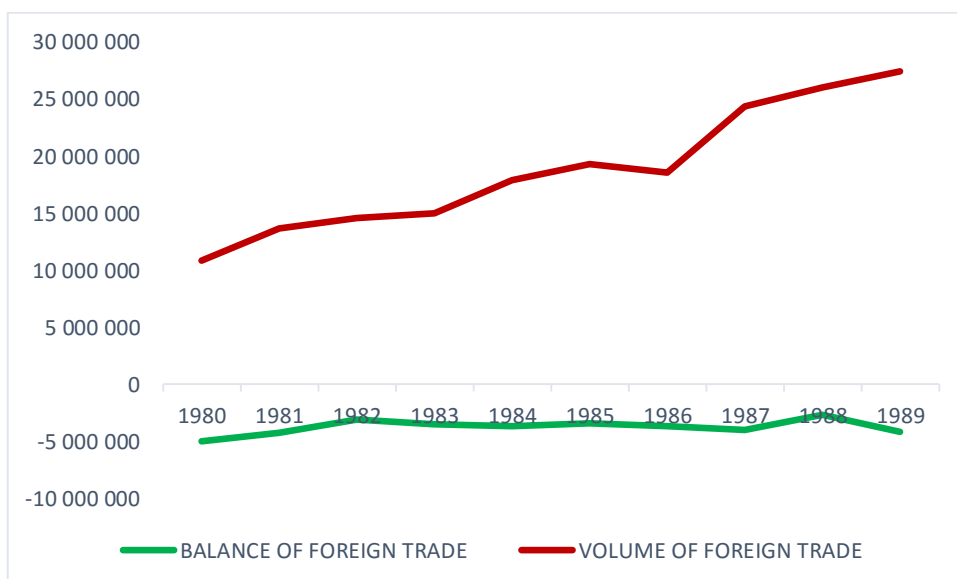


**Figure 2.15.** Change in exports and imports between 1980-1989

Source: <https://www.tuik.gov.tr> [accessed 25.02.2019].

Note: The figure was prepared by author.

Between certain years, change in export exceeded change in import. However, just the opposite had happened between some years. Nevertheless, import was greater than export. Although volume of foreign trade raised, foreign trade deficit also increased as can be seen in figure 2.16..

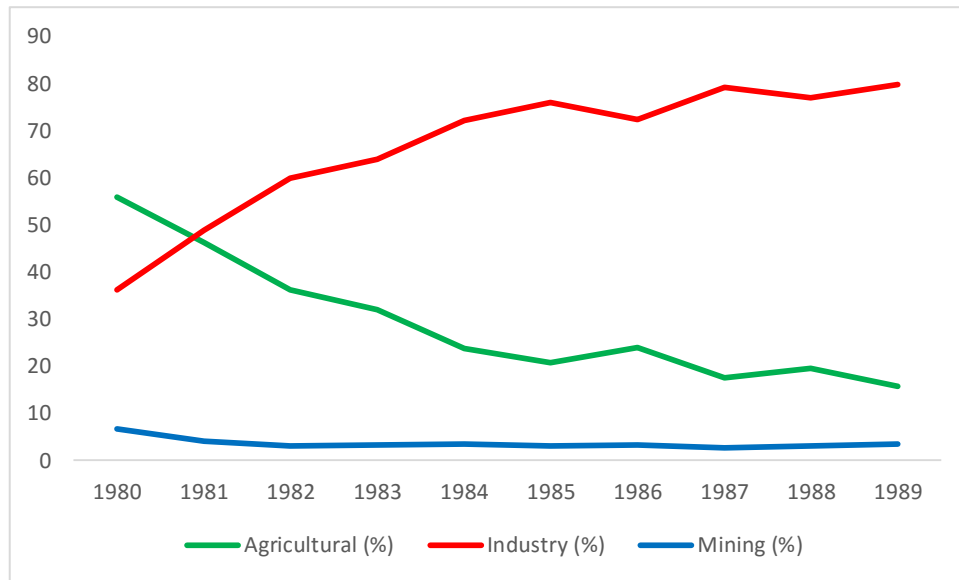


**Figure 2.16.** Balance and volume of foreign trade between 1980-1989

Source: <https://www.tuik.gov.tr> [accessed 25.02.2019].

**Note:** The figure was prepared by author.

When figure 2.16 is examined, it can be seen that there is no any important spike. However, the foreign trade deficit rose from 2.673. 374 \$ to 4.167.451 \$ in 1989. The structure of exports changed with export growth in Turkey in this period. Sectoral distribution of exports is shown as follows.



**Figure 2.17.** Sectoral distribution of exports in the periods of 1980-1989

**Source:** <https://www.tuik.gov.tr> [accessed 04.04.2019].

**Note:** The figure was prepared by author.

Agriculture took an important place in Turkey's exports before 1980. However, Turkey's foreign trade structure changed with 24 January decisions. According to this, when it is examined the figure 2.17., the share of agriculture in exports decreased and the share of industry increased. Thus, it is seen that the 24 January decisions were successful in favour of export orientation and industrial products.

After the 24 January decisions, a series of packages were implemented in the economy. The most important of these is the Decision No. 32 taken in 1989. Turkish Lira became convertible, and control and restriction on capital movements were removed. In other words, as well as international direct investments, international financial investments could easily enter in and exit from the economy. However, imports of intermediate goods increased with the liberalization of foreign exchange. Instant foreign exchange movements became a threat for the country's economy. An inflationary

environment emerged in parallel with the sudden foreign exchange movements. This increased the short run market interest rates and forced the state budget (Kepenek, 2014).

After the 24 January decisions, although Turkish economy took a step in a structural change stage, the Decisions could not achieve exact success in required stabilization of the economy. Thus, the economy faced a new crisis in 1988. While the prices rose, the production declined. While the real investment declined, a trend of investment happened in sectors do not issue to international trade. As a result, consumption increased. While, the real wages declined, interest rates and public deficit raised but the current account balance of payments had surplus. The unlimited free capital movements caused to go through the crisis. One of them was the 5 April 1994 crisis (Karluk, 2014; Karluk and Kucuksakarya, 2016).

### **2.2.2. 5<sup>th</sup> April decisions**

In the early 1990s, besides external factors like the recession in the world economy and Gulf crisis; the problems in the country such as high inflation rate, public deficit, high domestic and foreign debt stock led to crisis in 1994. As a result of this crisis, on 5 April 1994, the government launched the stabilization and structural reforms program. The program underlined fiscal adjustment which supported by constructional reforms aimed at falling the act of the public sector in the economy. This crisis was the first crisis that can be considered as banking and financial crisis in Turkey. (Bayar, 1996; Ertugrul and Selcuk, 2001; Kose, 2002; Seymen, 2009).

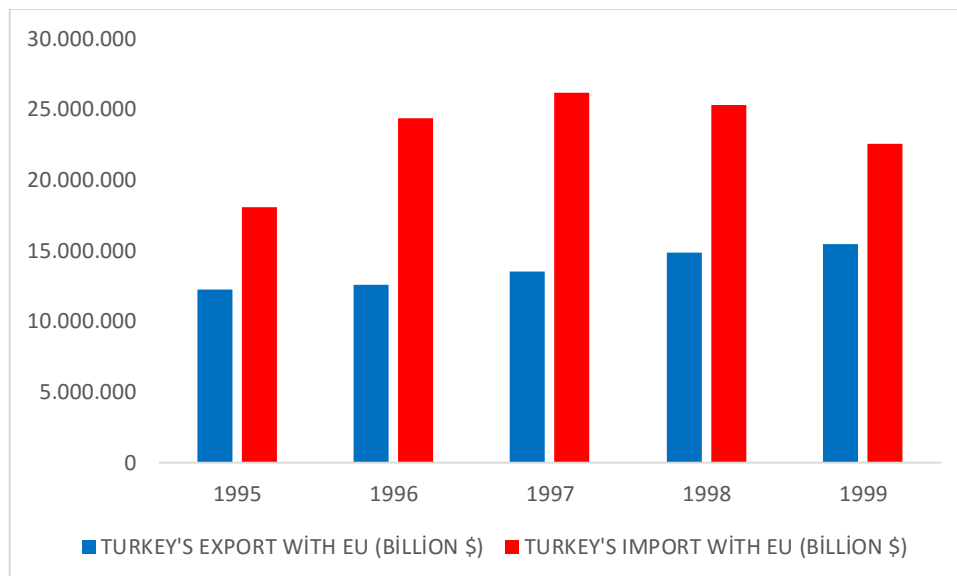
With the 5 April decisions, firstly, it was aimed to reduce public deficits and maintain stability. The objective in the short run re-stabilized foreign trade balance and foreign exchange markets, and foreign trade policy increased foreign exchange revenues. Foreign exchange reserves were important for Turkey as a country which depends on imports. Also, foreign exchange rate was targeted to be in compliance with inflation. In the medium term, to reduce public deficit and inflation was main objectives and in the long run, sustainable growth was the major goal for 5 April Decisions (Firat, 2009).

Precautions implemented within the scope of 5 April Decisions are as follows.

- Devaluation of the Turkish lira.
- Making the central bank more autonomous.
- Expansion of the scope of foreign capital.

- Liberation of exchange rates.
- Making regulation to improve efficiency in tax control.
- Increasing the prices of State Economic Enterprise (SEE) goods to gain more public revenues.
- Supporting investments and production, which is high added value and international quality, in accordance with EU norms within the framework of the Customs Union (CU).

The CU signed between Turkey and EU in 1996 was the first step of Turkey's membership to EU. The CU is the widest trade partnership that implemented the outward oriented growth policy of Turkey (Akca, Bal, and Caglayan, 2017). The data of Turkey's exports and imports with EU is as follows.

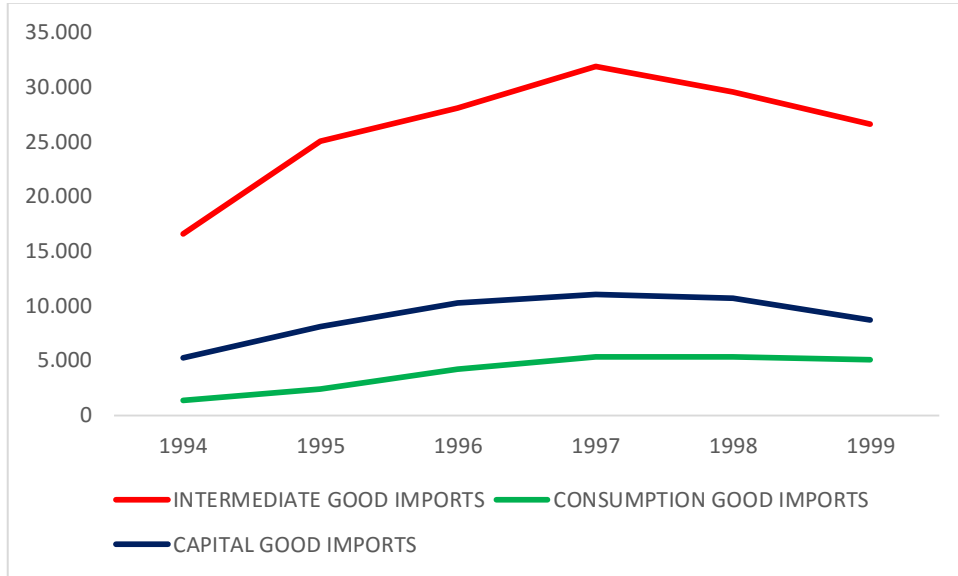


**Figure 2.18.** *Turkey's exports and imports with EU*

**Source:** <https://www.tuik.gov.tr> [accessed 12.04.2019].

**Note:** *The figure was prepared by author.*

When it is examined Turkey's foreign trade with EU, it is seen that the imports and exports increased compared to non-member of the CU years. In 1995, while export was almost 12 billion \$ and import was 18 billion \$, export increased by 15 billion \$ and import increased 22 billion \$ in 1999. So, CU affected Turkey's foreign trade volume positively. However, imports that Turkey import with EU capital and intermediate goods take an important place. Distribution of commodity groups' import is as follows.



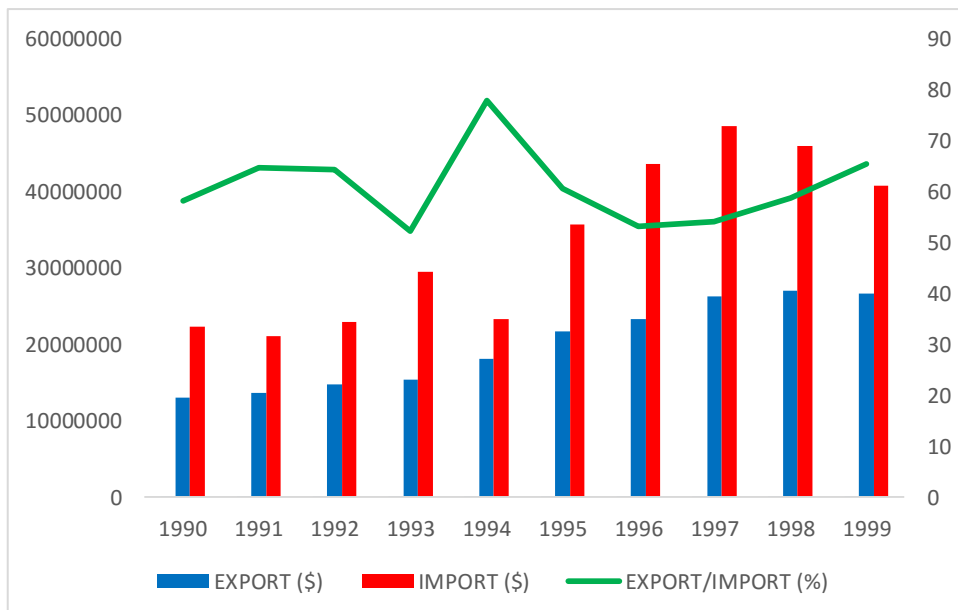
**Figure 2.19.** *Commodity groups' distribution of imports in the period 1994-1999 (Million \$)*

**Source:** <http://www.sbb.gov.tr> [accessed 12.04.2019].

**Note:** *The figure was prepared by author.*

When figure 2.19. is examined, it was seen that intermediate, consumption and capital goods imports increased from 1994 to 1997. It implies that CU took effect on sub-group of imports. However, it was seen that all sub-group of imports declined after 1997. This can be interpreted as the industry was influenced by economic policy in those years.

Turkey's foreign trade statistics in the period between 1990-1999 are as follows.

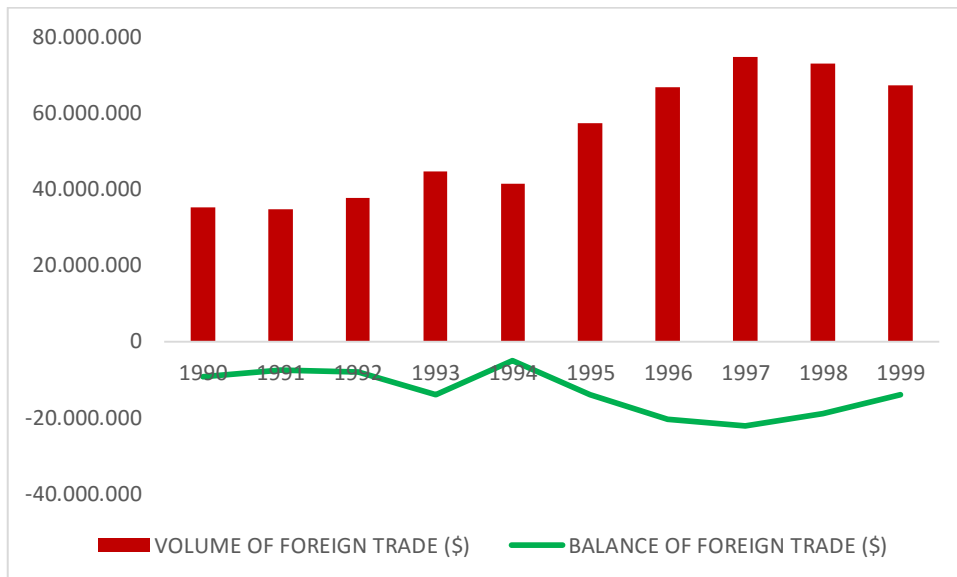


**Figure 2.20.** Turkey's foreign trade statistics in the period between 1990-1999 (Thousand \$)

**Source:** <https://www.tuik.gov.tr> [accessed 25.02.2019].

**Note:** The figure was prepared by author.

While exports increased slowly until 1994, imports raised from 22 thousand \$ to 29 thousand \$. After 1994, with a high rate of devaluation, export was expected to increase faster. However, the expected was not realized. Even so, imports increased more than exports until 1997, although it decreased after 1997. Proportion of imports covered by exports followed a fluctuating course.

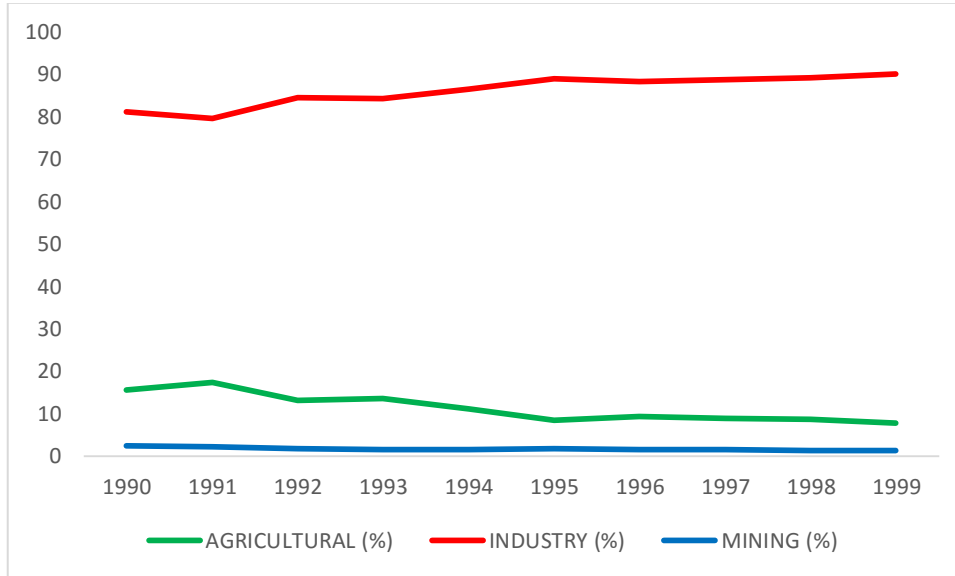


**Figure 2.21.** Balance and volume of foreign trade between 1990-1989 (Thousand \$)

**Source:** <https://www.tuik.gov.tr> [accessed 25.02.2019].

**Note:** The figure was prepared by author.

When foreign trade balance is examined, foreign trade deficit followed a growing trend, except in 1994, when stability decisions were implemented. In 1997, the foreign trade deficit reached its maximum level. The Far Eastern crisis in 1997 triggered this situation. The crisis caused lack of domestic demand in these countries. Also, Turkey's exports decreased in that period (Varol, 2003). Sectoral distribution of exports in the periods of 1990-1999 is shown in Table 2.22..



**Figure 2.22.** Sectoral distribution of exports in the periods of 1990-1999

**Source:** <https://www.tuik.gov.tr> [accessed 04.04.2019].

**Note:** The figure was prepared by author.

When the figure is examined, while the share of agriculture in total exports was 15,6% in 1990, it decreased to 7.7% in 1999. While the share of industrial sector in total exports was 81.1% in 1990, it increased to 90.1% in 1999. This table shows that Turkey transformed from a less developed country is concentrated in agricultural products to industrial goods exporter. Major exporter sectors in Turkey were also major importers sector. This is an important indicator of the import dependency of export.

Neoliberal reforms diverted well the available capability from import substituting industries to export industries. However, Turkey's foreign expansion experiences show that export-oriented strategy cannot maintain growth out of a strategic plan designed to supplement market-oriented reforms. This needs a larger long run strategy of industrial reconstruction (Bayar, 1996).

### **2.3. From the 2000s to the Present**

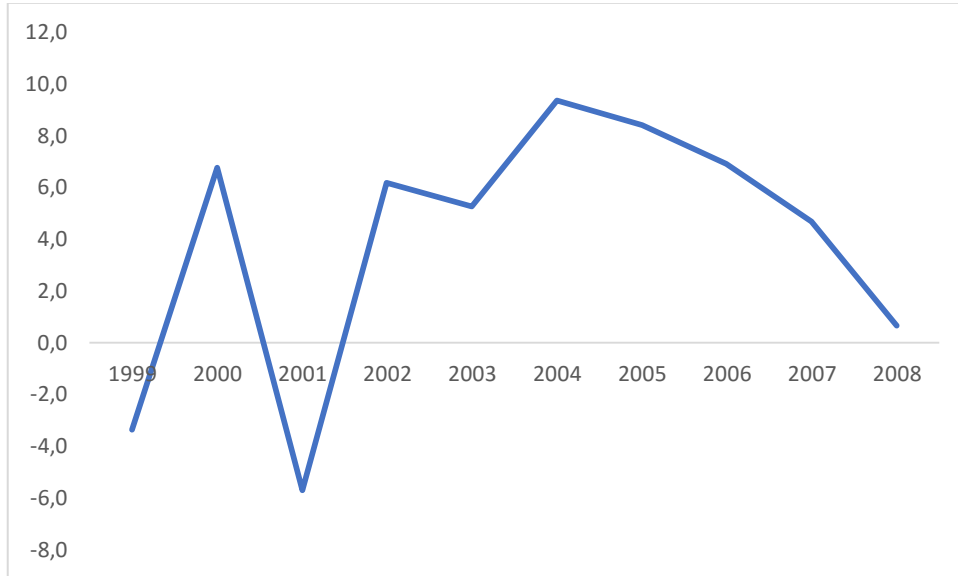
Because of the Russian and Asian crises, Turkish economy experienced a crisis again in 1998 and 1999. With the negative growth connected with high inflation, a disinflation program was announced at the end of 1999. This program was supported by IMF. The objectives of the program were to reduce consumer inflation; decline real interest rates to the appropriate level; increase potential of growth of economy and

provide efficient and fair distribution of resources in the economy. The program would be valid for three years, but it failed because of the following crises in 2000 and 2001 (Karluk, 2014; Goymen and Lewis, 2015).

The crises, December 2000 and February 2001, were financial crises. Since it was trusted the monetary financing heavily and because of fiscal discipline deficiency, crises were inevitable. Thus, the crises led to increase in interest rate and inflation. Kemal Dervis who was vice chairman of the WB at that time launched the transition to the strong economy program. The objectives of the program were:

- To eliminate the instability caused by the abandonment of the exchange rate regime.
- To create contemporary corporate structures.
- To perform structural reforms.
- To fight against inflation.
- To increase the competitive capacity.
- To resolve unfair distribution of income.
- To develop markets and technology.
- To provide a sustainable growth environment (Airaudo, et al., 2004; Hakura, 2013; Karluk, 2014).

Following the general evaluation of the developments in the early 2000s, Turkey's economy is examined in the last 19 years of post-2000 period. Therefore, the developments in basic macroeconomic indicators such as national income, growth and foreign trade have been analysed by using the data of the last 19 years. However, the period from the 2000s to the present must be separated in two sections because of the break in the 2008 crisis. Firstly, growth rates are examined until crisis.

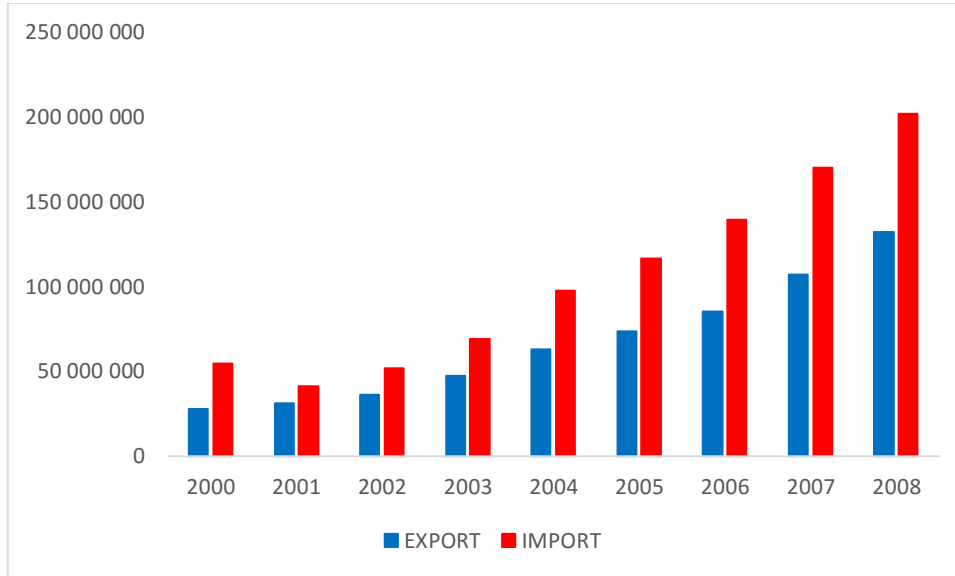


**Figure 2.23.** Turkey's growth rate from 1999 to 2008

**Source:** <https://www.tuik.gov.tr> [accessed 25.02.2019].

**Note:** The figure was prepared by author.

When figure 2.23. is investigated, unsteady growth is observed. Revenue loss in 1999 stemmed from the crises in 1998. While the growth rate improved in 2000, it fell back to minus rate after the crises in December 2000 and November 2001. When the transition to the strong economy program was implemented, the economy came through the crisis again. Following the crisis in 2002 and 2003, economic growth was 6.2% and 5.3% respectively. In 2004 and 2005, growth exceeded 8%. However, the economic growth performance slowed down in the later 3 years. With the crisis in 2008, the economy shrank significantly.



**Figure 2.24.** Turkey's exports and imports from 2000 to 2008

**Source:** <https://www.tuik.gov.tr> [accessed 25.02.2019].

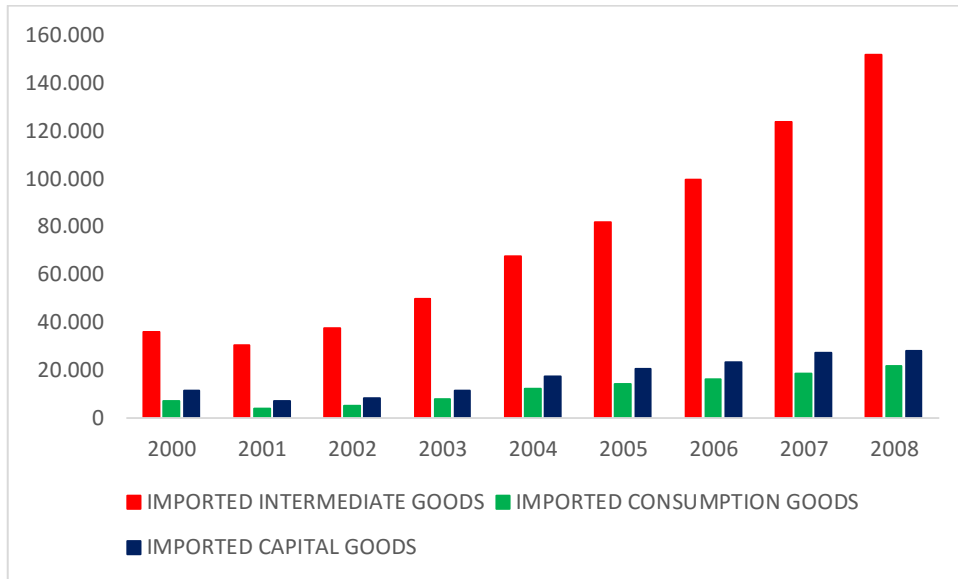
**Note:** The figure was prepared by author.

When figure 2.24. is examined, exports increased gradually and exceeded 100 billion dollars in 2007. Imports increased faster than exports. Even, imports, which were \$ 54 billion in 2000, increased almost four times in 2008.

Despite the positive developments in world trade in 2000, the developments in international markets against the Euro and the high increase in crude oil prices raised the costs. External factors such as these prevented the expected increase in exports. Another reason that adversely affected our exports was the appreciation of TL by the exchange rate policy in the Inflation Reduction Program, which was implemented in 2000. In 2001, exports increased by 31.3 billion dollars compared to the previous year. As a result of this increase in exports, creating a promotion and marketing network also made an important contribution to the development of our exports with the countries in the region. In 2001, imports decreased to 41.4 billion dollars compared to the previous year (SPO, 2007).

When we examine the year 2002, there are serious improvements in exports. As a reason of these increases the Transition to Strong Economy Program, the macro economic conditions put pressure on real wages, the decline in interest rates and hence the increase in credit opportunities, starting to compete in international markets. The rising demand

for consumption and the depreciation of the US dollar against the EURO in international markets can be shown (SPO, 2007).

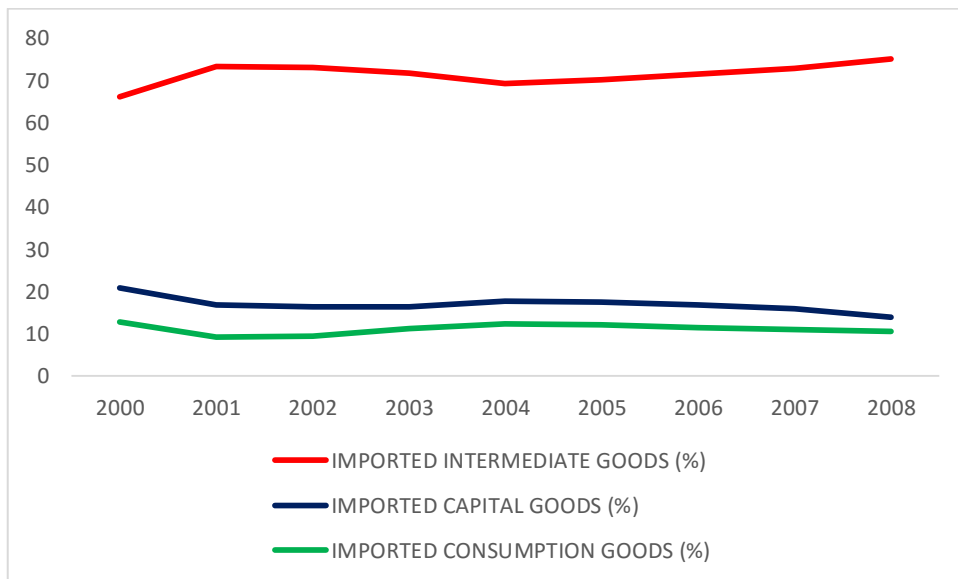


**Figure 2.25.** Turkey's sub-group of imports according to BEC from 2000 to 2008

**Source:** <https://www.tuik.gov.tr> [accessed 23.04.2019].

**Note:** The figure was prepared by author.

When the sub-group of import is analysed, imported intermediate goods had the largest share in that period. While imported capital goods were the second, imported consumption goods were in the third rank.



**Figure 2.26.** Turkey's sub-group of imports share in total imports according to BEC from 2000 to 2008

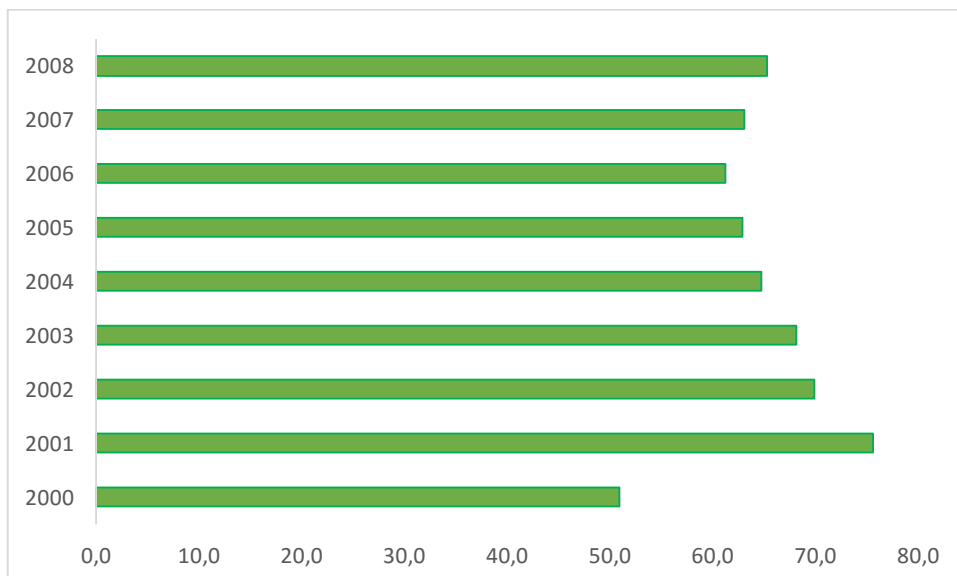
**Source:** <http://www.tuik.gov.tr> [accessed 23.04.2019].

**Note:** The figure was prepared by author.

The share of imported intermediate goods in total imports increased gradually. Imported capital and consumption goods followed a fluctuating course. The most important problem related to sectoral exports is seen as import dependency of export and production.

Gunluk-Senesen and Senesen (2003) indicated that the import dependency increased significantly in the post-1980 trade liberalization period. Another important fact in the framework import dependency of export, is that the traditional export sectors such as textiles-clothing and food are significantly dependent on imports. They also indicated that the total shares of these sectors have the same share as the petroleum sector which is in the second place in the imported intermediate goods. Bauer and Pamukcu (2000) pointed out the fact that the transformation of the export sectors over time increased the import demand for export. After 1980, imports also increased due to the increase in exports of manufacturing industry.

In spite of increase in exports, the fact that also increase in imports continuously disrupted rate of exports meeting imports. Proportion of imports covered by exports is as follows.

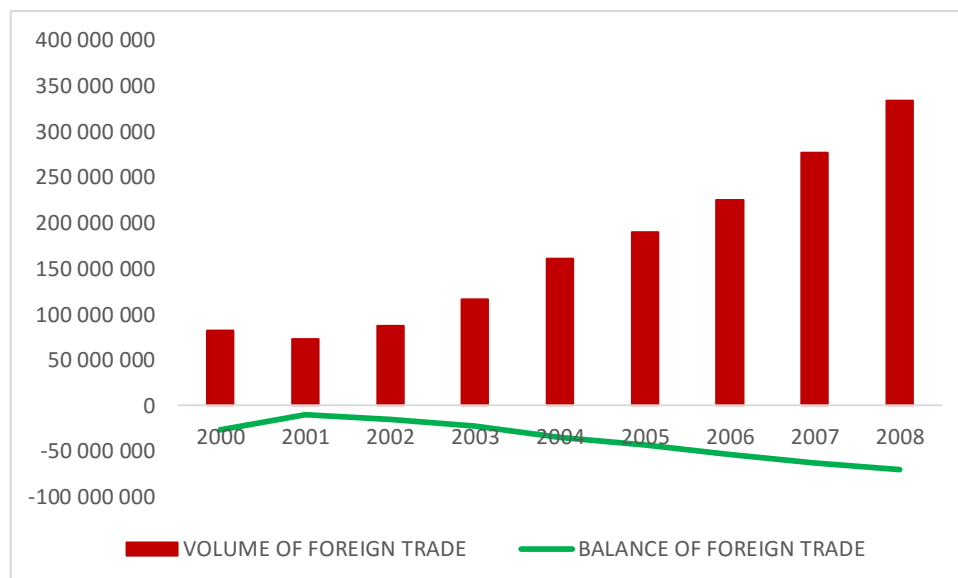


**Figure 2.27.** Turkey's proportion of imports covered by export from 2000 to 2008

**Source:** <https://www.tuik.gov.tr> [accessed 25.02.2019].

**Note:** The figure was prepared by author.

Although the ratio of exports to imports was mostly around 50% between 1990 and 2001 period, it was 75% in 2001. These increases stemmed from the fall in imports due to economic crises (Seyidoglu, 2003). The ratio of exports to imports declined continuously between 2002 and 2006. In 2008, the ratio increased to 65,4%. Since imports generally exceed exports, foreign trade deficit became a chronic problem in the country. Volume of foreign trade and balance of foreign trade for Turkey is as follows.



**Figure 2.28.** Turkey's volume and balance of foreign trade from 2000 to 2008

**Source:** <https://www.tuik.gov.tr> [accessed 25.02.2019].

**Note:** The figure was prepared by author.

The foreign trade deficit which was a serious problem continued and continuously increased after 2000 (Sungur, 2015). Trade deficit that was almost 10 million dollars in 2000 increased nearly 7 times.

Following the 2000 and 2001 crises, several regulations were made to prevent the collapse the banking system. These increased financial obligations of the government. The current account deficit, which shrank significantly due to the negative effects of the

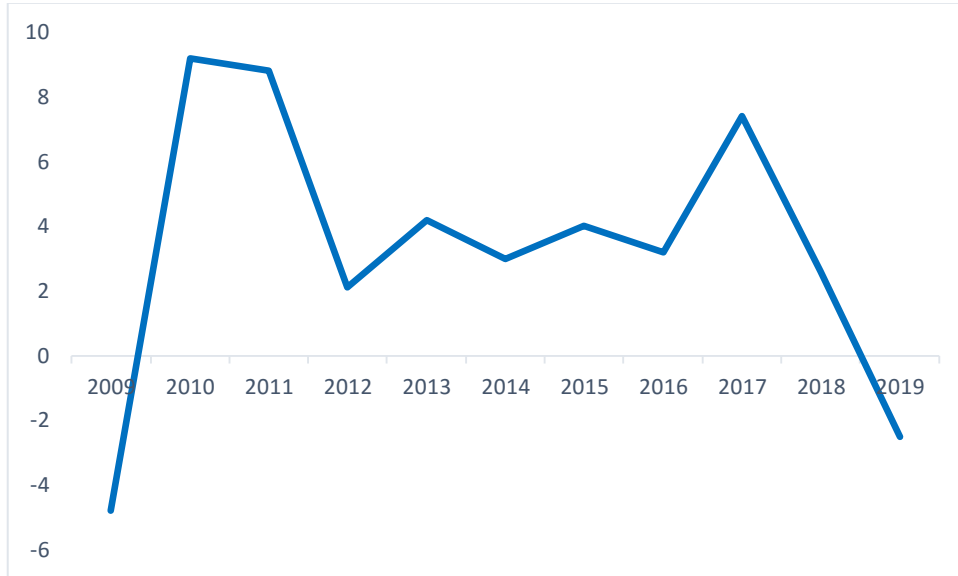
supply and demand side, began to increase rapidly (Boratav, 2001). Turkey's economy included a disciplined fiscal practice and using of intensive foreign resources process with the Transition to Strong Economy Program. Money and exchange rate policies were successful. However, these positive developments could not prevent the growth of the current account deficit (Inan, 2006).

In 2008, a global crisis broke out in the mortgage market in the United States of America (USA). This crisis had been effective worldwide. The 2008 crisis has caused the greatest economic stagnation in the recent years. So, trade has contracted considerably (Alantar, 2008). While the crisis caused the recession in developed country, it caused the serious decline in economic growth and demand (Ozturk , 2010).

The global crisis also over impressed unemployment rates. Unemployment rates in the USA and developed countries followed upward trend. In Turkey, the unemployment rate exceeded 10%, while the rate was below 10% in 2006 and 2007. In the period of 2007 and 2008, inflation rates also increased. However, the global crisis was not the only factor that increased the inflation rates. The rise in oil and food prices also had inflationary effects (Alantar, 2008).

The global crisis affected both financial and real sectors in many countries. But the crisis affected real sector more than financial sector in Turkey's economy. The financial sector did not suffer much from the crisis. The most important reason for this was the regulations made in the banking sector after 2001 crisis (Cetinkaya, 2011).

In this case, after the 2008 crisis, it is useful to examine the basic macroeconomic indicators for Turkey. The growth rate for Turkey in the period 2009-2019 is as follows.



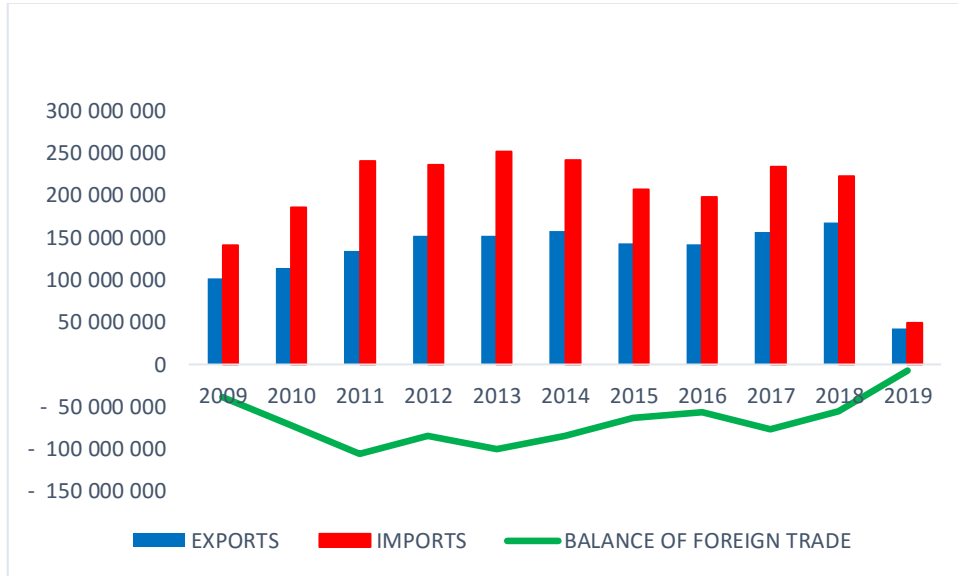
**Figure 2.29.** *Turkey's growth rate from 2009 to 2019 (%)*

**Source:** <https://www.tuik.gov.tr> [accessed 30.04.2019]

**Note:** The figure was prepared by author.

Because of the global crisis, 4,8 % economic shrinkage was experienced in 2009. The economy started to recover in 2010 and 2011. However economic growth slowed down dramatically from 2012 to 2016. Turkey's economy grew by 2,1% in 2012, 4,2 in 2013, 3% in 2014, 4% in 2015 and 3,2% in 2016. Economic growth which raised by 7,4% in 2017 decreased again in 2018. According to estimations of IMF, Turkey's economic growth will be -2,5% in the end of 2019.

In terms of government periods, the average annual growth rate was 7,5% between 2003-2007, 2,4% between 2007-2011, 4,5% between 2011-2014 (Sungur, 2015) and 2,9% between 2015-2019.

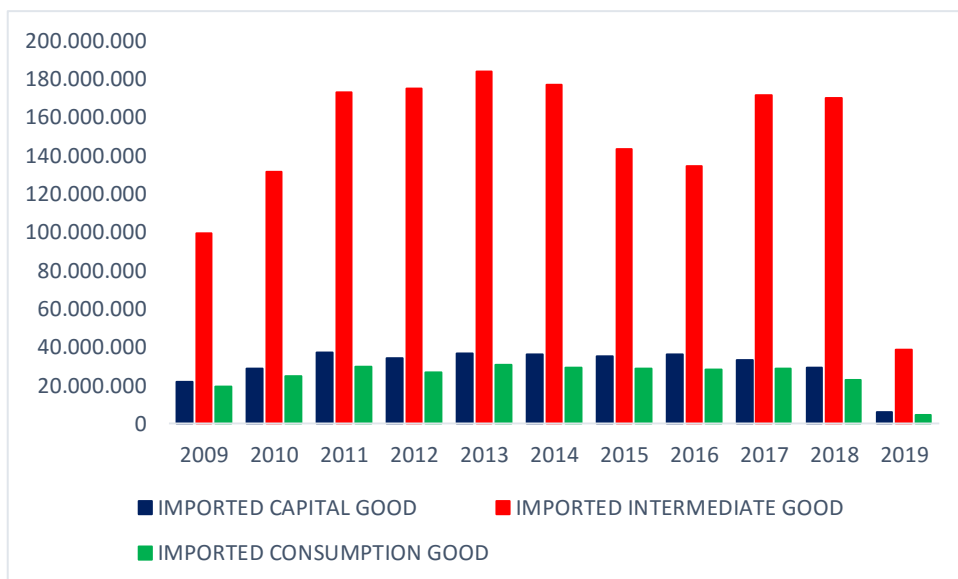


**Figure 2.30.** Turkey's foreign trade from 2009 to 2019 (Thousand \$)

**Source:** <https://www.tuik.gov.tr> [accessed 30.04.2019]

**Note:** The figure was prepared by author.

Due to global crisis, foreign trade in Turkey decreased considerably. Foreign trade followed a fluctuating course between the years 2009 and 2018. As ever as, import was more than export. Both imports and exports decreased significantly by 2019. The current account deficit continued in this period. However, the current account deficit decreased compared to previous years in 2019. The reason of this decline is decrease in difference between import and export.

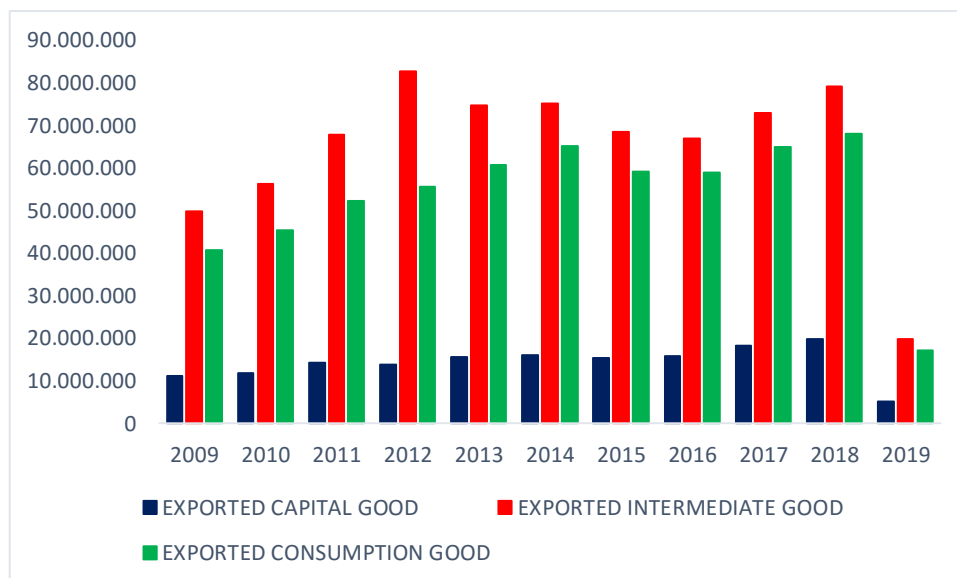


**Figure 2.31.** Turkey's sub-group of imports according to BEC from 2009 to 2019 (Thousand \$)

**Source:** <https://www.tuik.gov.tr> [accessed 01.05.2019]

**Note:** The figure was prepared by author. Data covers first three months in 2019.

It is known that imports grow more than export in Turkey. When the sub-group of imports and exports are examined, it is seen that the situation differentiated. In the light of the data in Figure 2.31., imported intermediate goods have an important place in our imports. Imported capital goods are in second place, while imported capital goods are in third place in the period of 2009-2019.



**Figure 2.32.** Turkey's sub-group of exports according to BEC from 2009 to 2019 (Thousand \$)

**Source:** <https://www.tuik.gov.tr> [accessed 01.05.2019]

**Note:** The figure was prepared by author. Data covers first three months in 2019.

When figure 2.32. is examined, exported consumption goods are the first for Turkey's export. The second one is exported intermediate goods and the third one is the exported capital goods in the period of 2009-2019. When the sub-group of exports and imports are compared, exported consumption goods are more than imported one. Contrary to this, imported intermediate goods are more than exported one.

Larger proportion of Turkey's export structure is seen to be dependent on import. Since imported inputs are used in the production of exported goods, Turkey's foreign trade deficit is constantly increasing. Therefore, the increase in Turkey's import is greater than the increase in exports. Turkey's export structure should be shifted to higher value-added products and complied with research and development activities. These are important in reducing the point of Turkey's foreign trade deficit (Ozel, 2011).

## CHAPTER THREE

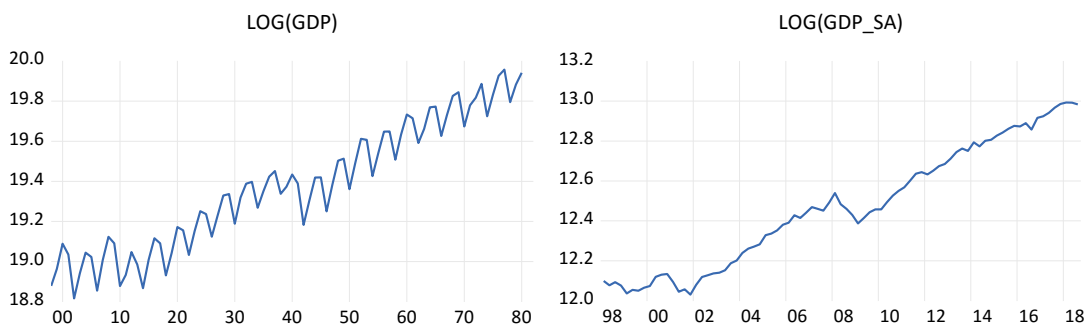
### 3. TIME SERIES ANALYSIS OF INTERACTIONS BETWEEN IMPORTS AND EXPORTS IN TURKEY

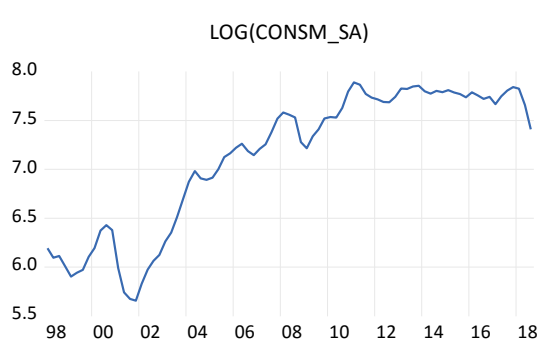
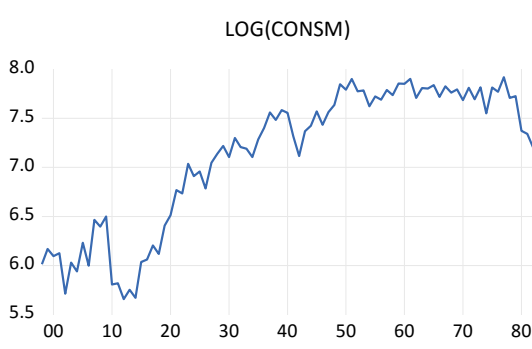
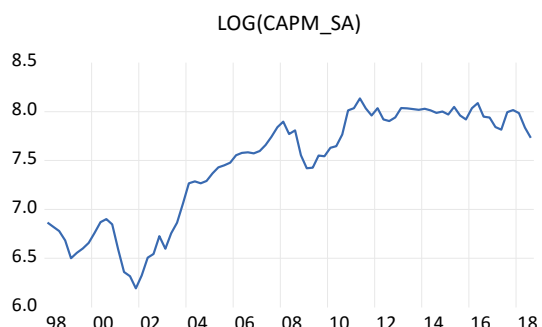
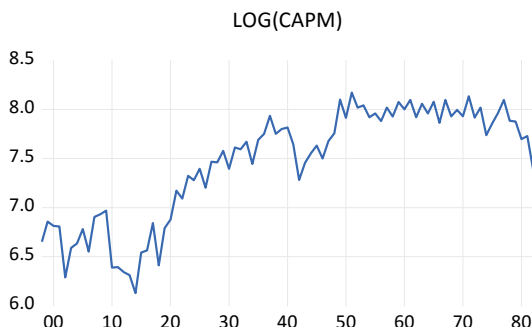
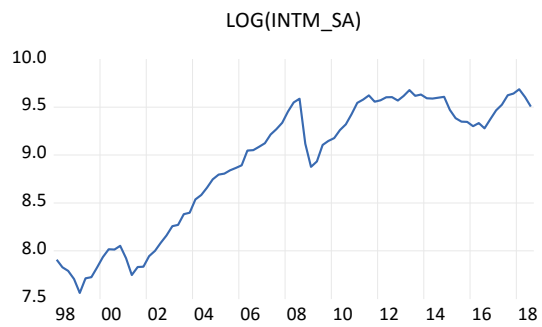
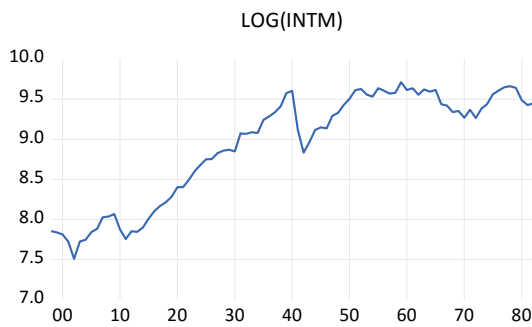
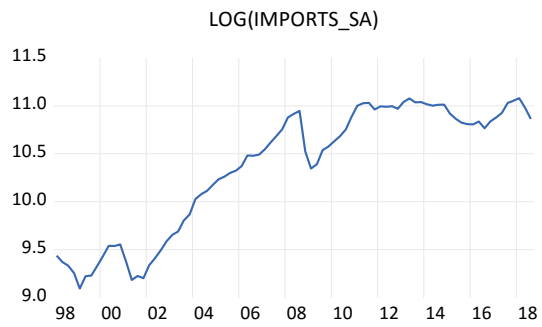
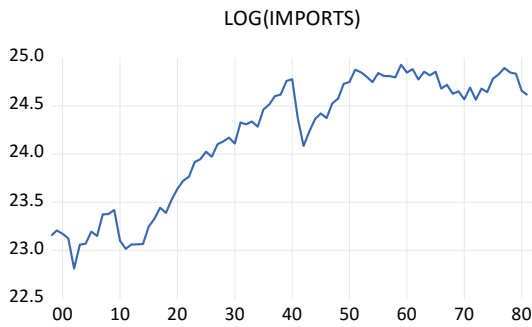
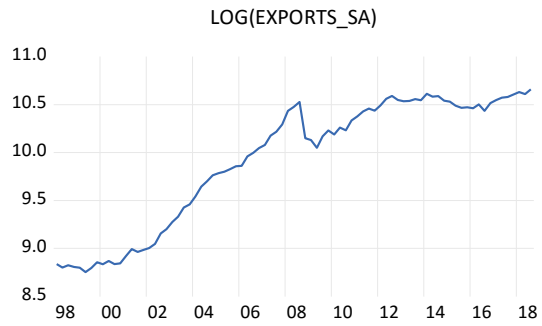
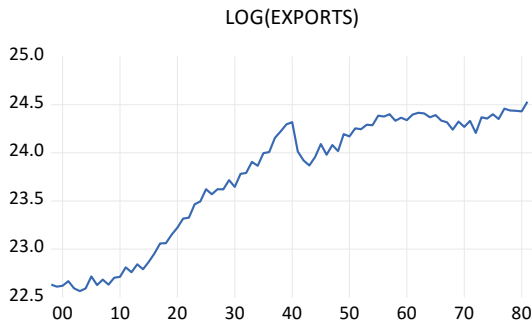
The purpose of the analysis is to examine the relationship between economic growth, export, import and subgroup of import and also determine the existence and direction of the causal relations between variables. In this context, import dependency of export will be investigated for Turkey.

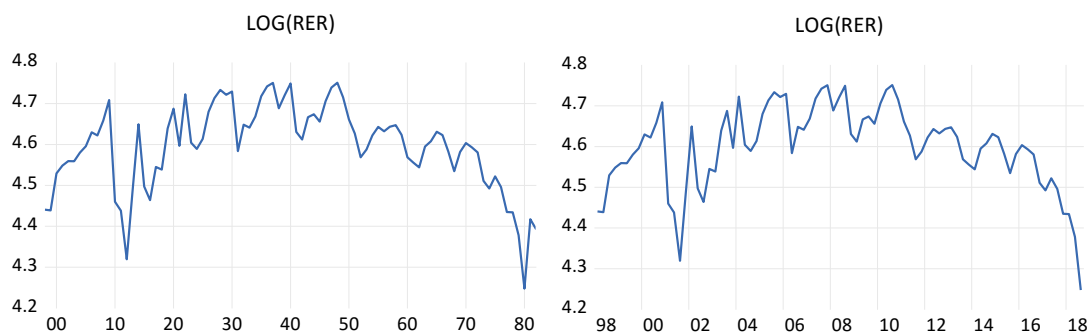
#### 3.1. Data

The data set includes real gross domestic product (GDP), total export (EXPORT), total import (IMPORT), imported intermediate goods (INTM), imported capital goods (CAPM) and imported consumption goods (CONSM) for Turkey with quarterly data in the period from 1998:1 to 2018:3. Real exchange rate (RER) is added into the model as exogeneous variable. The data are taken from Turkish Statistical Institute and Central Bank of the Republic of Turkey. Eviews 10 programme is used in the analysis.

Logarithm of all the variables used in the analysis was taken. The logarithms of the series of these variables are removed seasonal effects thereby using Tramo/Seats method. In addition, time series plots of all variables display a structural break following the 2008 crisis. The time series plots of all variables used in the analysis are as follows.







**Figure 3.1.** *GDP, export, import, imported intermediate good, imported capital good, imported consumption good, real exchange rate and seasonally adjusted GDP, export, import, imported intermediate good, imported capital good, imported consumption good and real exchange rate*

### 3.2. Methodology and Findings

The dynamic and causal links between variables are examined in Turkey from 1998Q1 to 2018Q3. To find possible causal link between variables are used Granger causality test and to apply the Granger causality test, it is begun to investigate the time series features of the data. First, the order of integration of the series is examined by the unit root test. In order to specify unit roots in series, Augmented Dickey-Fuller (ADF) unit root test was applied. Then, to find presence of cointegration between series, Johansen cointegration test was applied. Thus, Granger causality test would not create any fake results. After these, applying Vector Error Correction Model (VECM), both short run and long run causality was determined between variables. Lastly, dynamic relations between these variables are analysed with impulse response and variance decomposition plots.

#### 3.2.1. Augmented Dickey Fuller unit root test

Before possible causality between the variables is identified, it is required to set integration degree of them (Bayat et. al., 2015). There are many tests to determine whether the series is stationary or not there are many tests. The most popular test is the Augmented Dickey-Fuller (ADF) test (Griffiths, Hill, and Lim, 2011). In this regard, ADF unit root test is implemented for examining the stationary properties of the data.

ADF unit root test is carried out to the logarithms of the time series used in the analysis with and without time trend (Alavinasab, 2013). The stabilisation of the order of integration of logarithmic variables is essential to implement the analysis with Johansen

procedures (Alam, 2003). The ADF unit root test is applied by adding lagged values of the dependent variable into the Dickey-Fuller (DF) equations (Gujarati and Porter, 2009). Regression of ADF test can be formulated as follows.

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^m a_i \Delta Y_{t-i} + \varepsilon_t \quad (3.1)$$

Where  $\Delta Y_t$  that is investigated stationary variable,  $\beta_1, \beta_2, \delta$  are coefficients of the equation,  $\varepsilon_t$  is random error term.  $\Delta$  indicates the difference of the relevant variable. Two hypotheses are used in practice to test the existence of the unit root. These are:

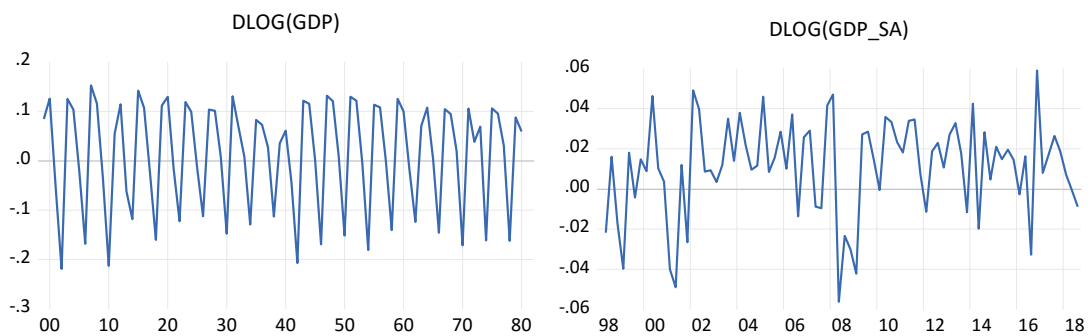
$$H_0: \delta = 0 \text{ (Series is nonstationary)}$$

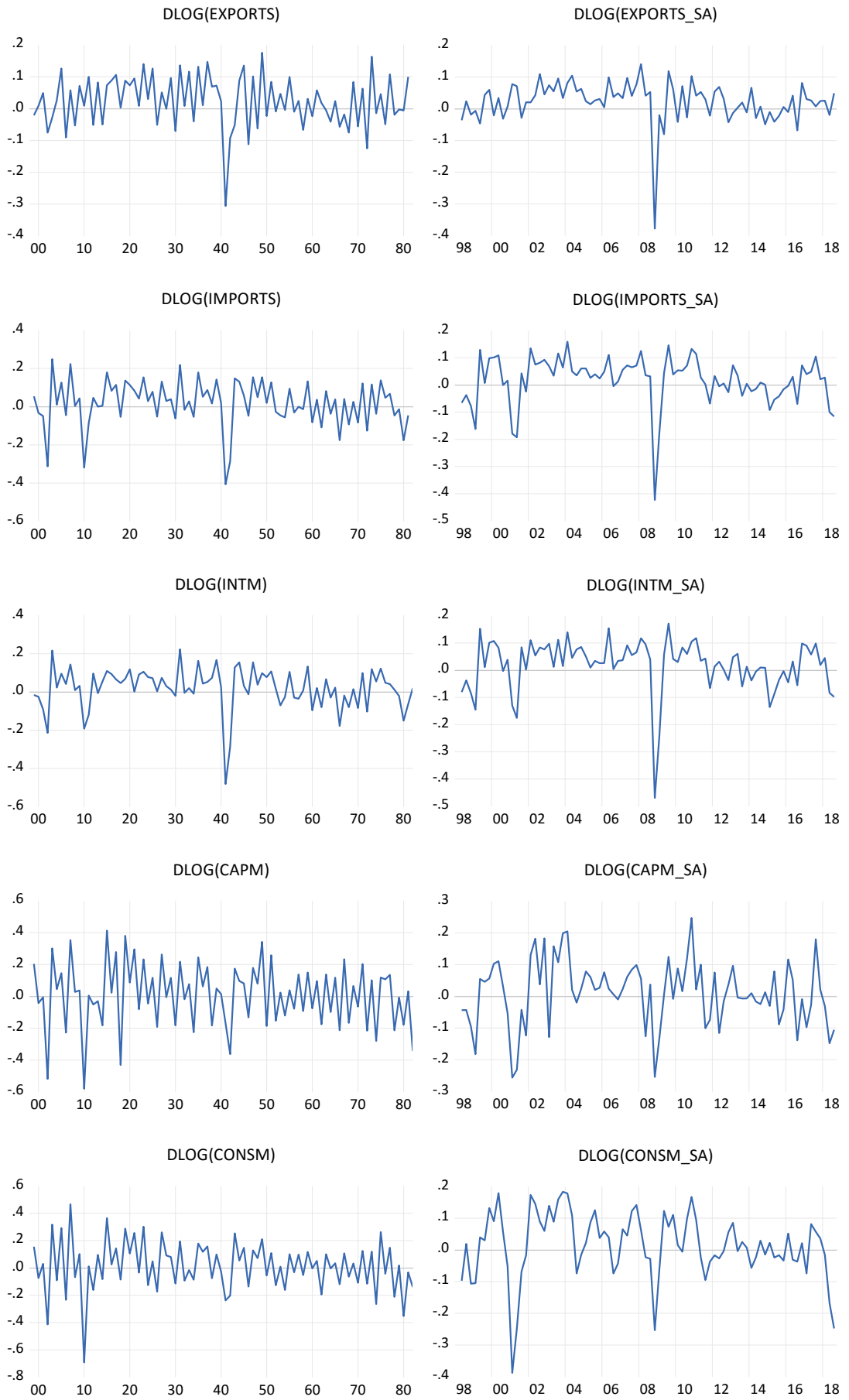
$$H_1: \delta < 0 \text{ (Series is stationary)}$$

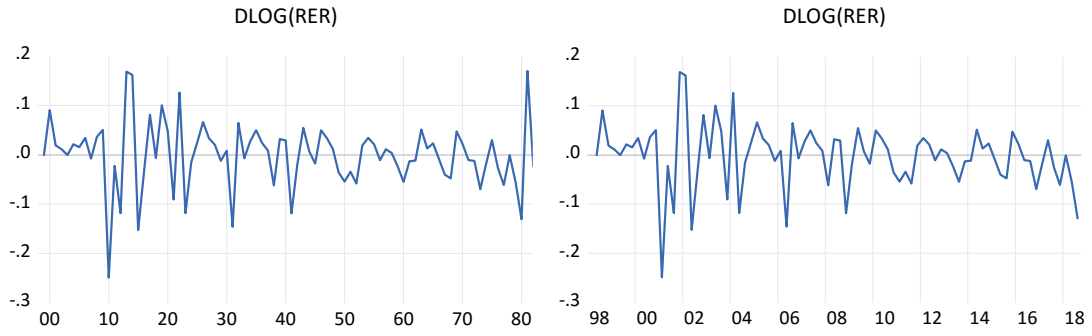
The null hypothesis is that the series is nonstationary. If the null hypothesis is accepted, nonstationary is concluded; if the null hypothesis is rejected that  $\delta = 0$ , then it is concluded the series is stationary (Griffiths, Hill, and Lim, 2011).

### 3.2.1.1. ADF unit root test results

Before testing the causal relationship between the variables, the order of integration of the variables is examined by unit root test. It is important whether the series are stationary or not because there is a high probability that spurious regression problems will be caused in nonstationary series. On the contrary, it is less likely to face with spurious regressions problems if the series are stationary. Therefore, ADF unit root test is applied to the data in levels and first differences. According to ADF unit root test results, all variables are stationary in their first differences I (1) and does not contain unit roots for Turkey. Plots of logarithmic first differences of variables and logarithmic first differences of seasonal adjusted series are as follows.







**Figure 3.2.** *Plots of logarithmic first differences of variables and logarithmic first differences of seasonal adjusted series*

### 3.2.2. Vector autoregressive regression (VAR)

VAR analysis is a multivariate autoregressive model developed by Sims (1980) and applied without regard to the internal or external variables. When selecting the lag length in the VAR model, attention should be paid that lag length does not cause autocorrelation in the equations. Then, each variable is taken as a dependent variable respectively, and the optimal lag of the values of the dependent variable and other variables are determined, and these are used as independent variables (Kurt and Terzi, 2007). The simplest way to display the VAR model is as follows.

$$Y_t = \gamma_1 + \sum_{i=1}^k a_{1i} y_{t-i} + \sum_{i=1}^k a_{2i} x_{t-i} + u_{1t} \quad (3.2)$$

$$X_t = \theta_1 + \sum_{i=1}^k b_{1i} y_{t-i} + \sum_{i=1}^k b_{2i} x_{t-i} + u_{2t} \quad (3.3)$$

Where  $k$  is lag length and  $u_{it}$  indicates error terms with normal distribution.

In order to establish the VAR equation, the suitable lag length must be determined. In determining the lag length; 5 different criteria are used: AIC (Akaike Information Criterion), FPE (Final Prediction Error), HQ (Hannan-Quinn Information Criterion), LR (Sequential Modified) and SC (Schwarz Information Criterion) (Acet, Erdogan, and Koksall, 2016). The next step is to determine whether there is a long run relationship between the series. To find out the link between the series, Johansen cointegration test is used in this study.

#### 3.2.2.1. Johansen cointegration test

Cointegration analysis is a method used for modelling and estimating the long run relationship between nonstationary time series. Namely, it is used to investigate whether

there is a balance relationship between time series. This method was developed by Granger and he indicated that the existence of cointegration between variables was a correct long run relationship.

Cointegration tests, which test whether cointegration exists or not, are divided into two directions. The first is the tests based on the residues obtained from the cointegration regression like Engle-Granger's (1987) two-step cointegration method. The second is the tests based on vector autoregression. Johansen (1988) cointegration test is a vector autoregressive method.

Although Engle-Granger's two-stage cointegration method is easy to apply, it has many serious problems. This method assumes that the variables are weak exogeneity. Weak exogeneity is that the cointegration relationship disappears when the variables are replaced and also a nonstationary series may lead to false regression results. When the number of variables is three or more in an analysis, it is not possible to decompose applying this method. If it is used small sample applying Engle-Granger method, long run coefficients are biased (Sen, 2007 cited Song and Witt, 2000). Another problem is that the method consists of two stages. It means that if any error occurs in the first stage, the same error will occur in the second stage, as well (Enders, 2004). So, Johansen Cointegration analysis developed by Johansen and Juselius gives more reliable results.

The Johansen co-integration method is used to test the relationship between the variables based on the VAR model. VAR model is as follows (Johansen Juselius)/sesay.

$$\Delta X_t = \sum_{i=1}^{k-1} T_i \Delta X_{t-i} + \pi X_{t-k} + \delta + \eta_t \quad (3.4)$$

Where X is nonstationary variables vector,  $\delta$  is constant term,  $\pi$  equals  $\alpha\beta$ . The  $\alpha$  matrix shows the adaptation coefficient and the  $\beta$  matrix shows the cointegration vectors.

Johansen approach based on two likelihood ratio tests. The cointegration relationship between variables can be tested with these tests. These are trace test and maximum eigenvalue test. The trace and max test formula are as follows.

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^n \ln(1 - \lambda_i) \quad (3.5)$$

$$\lambda_{max}(r, r + 1) = -T \ln(1 - \lambda_{r+1}) \quad (3.6)$$

Where  $\lambda_i$  is the estimated value of the characteristic unit roots, r is the number of cointegration vectors and T is the number of observations. The calculated trace and

maximum eigenvalue statistics based on the Johansen cointegration test are compared with the critical values presented by Johansen and Juselius (1990). Then the cointegration relationship is determined. If the calculated trace and maximum eigenvalue statistics are greater than the critical values, it is said that there is a long run relationship between the series (Baday-Yıldız and Berber, 2011).

### 3.2.2.1.1. Johansen cointegration test results

The cointegration test does not inform about the direction of the relationship between variables. Therefore, to find the causal relationship between the variables, the Granger Causality test based on VECM should be examined.

After the unit root test is applied to the series, the existence of cointegration relationship will be determined by Johansen cointegration test. Cointegration test is applied to test whether there is a long-term relationship between variables. Trace and maximum eigenvalue test statistics are used for testing cointegration. The critical values used in both tests were created by Johansen and Juselius. Before using this test, it is necessary to determine the lag length in the VAR model. The lag length table is as follow.

**Table 3.1.** *The lag length results in VAR model*

Lag Length	LogL	LR	FPE	AIC	SC	HQ
0	-4070.020	NA	2.39e+36	100.7906	101.1453	100.9329
1	-3653.035	751.6029	1.97e+32	91.38358	92.80251*	91.95287*
2	-3611.483	68.74011*	1.75e+32*	91.24649*	93.72963	92.24276

\* indicates lag order selected by the criterion  
 LR: Sequential modified LR test statistic (each test at 5% level)  
 FPE: Final prediction error  
 AIC: Akaike information criterion  
 SC: Schwarz information criterion  
 HQ: Hannan-Quinn information criterion

According to table 3.1, the lag length is determined as two lags. After finding the lag length, VAR model is estimated and Johansen cointegration test is applied. The results of the test as follows:

**Table 3.2.** *The results of Johansen cointegration test*

<b>Trace</b>				
$H_0$	$H_1$	Statistics	5% critical values	Probability
$r = 0$	$r \geq 1$	224.7170	107.3466	0.0000
$r \leq 1$	$r \geq 2$	95.48363	79.34145	0.0019
$r \leq 2$	$r \geq 3$	56.05846	55.24578	9.0423
$r \leq 3$	$r \geq 4$	27.37911	35.01090	0.2579
$r \leq 4$	$r \geq 5$	11.29723	18.39771	0.3641
$r \leq 5$	$r \geq 6$	0.674200	3.841466	0.4116
<b>Max Eigenvalue</b>				
$H_0$	$H_1$	Statistics	5% critical values	Probability
$r = 0$	$r = 1$	129.2334	43.41977	0.0000
$r \leq 1$	$r = 2$	39.42517	37.16359	0.0270
$r \leq 2$	$r = 3$	28.67935	30.81507	0.0892
$r \leq 3$	$r = 4$	16.08188	24.25202	0.4067
$r \leq 4$	$r = 5$	10.62303	17.14769	0.3423
$r \leq 5$	$r = 6$	0.674200	3.841466	0.4116

The results of Johansen cointegration test in Table 3.2. show that the Johansen test identifies three co-integrating vectors under the Trace statistics and two co-integrating vectors under Max Eigenvalue statistics at 5% significance level. If these two statistics contradict with each other, the trace statistics are taken as basis. Accordingly, the number of co-integrating vectors is three. In other words, there are three cointegration relationships in the long term.

### **3.2.2.2. Vector error correction model**

A vector error correction model (VECM) is a restricted VAR intended for using with nonstationary series which are known to be cointegrated. The cointegration term is also accepted as the error correction term because the deflection from long run equilibrium is fixed gradually by way of a series of part short run corrections (Kumari and Malhotra, 2016).

The coefficient of error correction term displays whether past value of observed variables affect the current values of the variable under analysis. The magnitude and statistical significance of error correction term gauges the tendencies of every variable

towards equilibrium. A significant value of the coefficient shows the important role of past equilibrium errors in determining current results (Kumari and Malhotra, 2016).

The augmented form of Granger causality test with error correction term (ECT) is formulated in multivariate  $q^{\text{th}}$  order of VECM as follows:

$$\begin{bmatrix} \Delta EXPORTS_t \\ \Delta IMPORTS_t \\ \Delta GDP_t \\ \Delta INTM_t \\ \Delta CAPM_t \\ \Delta CONSM_t \end{bmatrix} = \begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \\ \beta_5 \\ \beta_6 \end{bmatrix} + \sum_{i=1}^q \begin{bmatrix} c_{11,i} & c_{12,i} & c_{13,i} & c_{14,i} & c_{15,i} & c_{16,i} \\ c_{21,i} & c_{22,i} & c_{23,i} & c_{24,i} & c_{25,i} & c_{26,i} \\ c_{31,i} & c_{32,i} & c_{33,i} & c_{34,i} & c_{35,i} & c_{36,i} \\ c_{41,i} & c_{42,i} & c_{43,i} & c_{44,i} & c_{45,i} & c_{46,i} \\ c_{51,i} & c_{52,i} & c_{53,i} & c_{54,i} & c_{55,i} & c_{56,i} \\ c_{61,i} & c_{62,i} & c_{63,i} & c_{64,i} & c_{65,i} & c_{66,i} \end{bmatrix} \begin{bmatrix} \Delta EXPORTS_{t-i} \\ \Delta IMPORTS_{t-i} \\ \Delta GDP_{t-i} \\ \Delta INTM_{t-i} \\ \Delta CAPM_{t-i} \\ \Delta CONSM_{t-i} \end{bmatrix} + \begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \\ \delta_5 \\ \delta_6 \end{bmatrix} [ECT_{t-1}] + \begin{bmatrix} \gamma_{1t} \\ \gamma_{2t} \\ \gamma_{3t} \\ \gamma_{4t} \\ \gamma_{5t} \\ \gamma_{6t} \end{bmatrix} \quad (3.7)$$

where ECT is the lagged error correction term. VECM shows both the short run and long run Granger causality. While the t-statistics on the coefficient of the lagged ECT specifies the importance of the long run causal effect, the short run causal effects can be acquired by the F test of the lagged explanatory variables (Boutabba, 2014).

### 3.2.2.2.1. Vector error correction model results

Vector error correction model can be applied if the variables used in the analysis are cointegrated and the long-term relationship between the variables has already been examined by Johansen's cointegration test. The cointegration relationship between the variables indicates that a causal relationship can also be identified. Long term causality relationship between variables can be interpreted via vector error correction model. So, vector error correction model is applied. Also, the error correction coefficient is expected to be negative and statistically significant.

**Table 3.3** *The results of the VECM*

<b>Error Correction</b>	<b>D(CAPM_S)</b>	<b>D(CONSM_S A)</b>	<b>D(EXPORTS_SA)</b>	<b>D(GDP_SA)</b>	<b>D(IMPORTS_SA)</b>
<b>CointEq1</b>	-0.539563 (0.70837) [-0.76170]	-0.056589 (0.48632) [-0.11636]	8.874077 (9.04959) [0.98060]	-8.487421 (32.2596) [-0.26310]	3.620995 (13.5420) [0.26739]
<b>CointEq2</b>	0.518043 (0.70217) [0.73777]	-0.089441 (0.48207) [-0.18553]	10.59386 (8.97050) [1.18097]	3.532553 (31.9776) [0.11047]	11.49793 (13.4237) [0.85654]
<b>CointEq3</b>	-0.012970 (0.01249) [-1.03818]	0.031842 (0.00858) [3.71241]	-0.101167 (0.15960) [-0.63386]	-1.036109 (0.56895) [-1.82110]	0.198427 (0.23883) [0.83081]

The first line of the numerical values in the table refers to the error correction term, the second line is the standard error, and the third row refers to the T statistics. In Table 3.3., imported capital good, imported consumption good, total export, economic growth and total import error correction test results are given. To find the long run causal relationship between variables, it is required that coefficients of the variables must be between 0 and 1, and sign of coefficients must be negative. Also, the absolute value of T statistics must be greater than 2. In addition, exogeneous variable real exchange rate affects imported capital goods and consumption goods in the long run. The result is as follows.

**Table 3.4.** *The result of exogeneous variable in VECM*

<b>Error Correction</b>	<b>D(CAPM_S A)</b>	<b>D(CONSM_S A)</b>	<b>D(EXPORTS_S A)</b>	<b>D(GDP_S A)</b>	<b>D(IMPORTS_S A)</b>
<b>RER</b>	7.884485 (2.19512) [3.59182]	3.089047 (1.50704) [2.04974]	-3.523064 (28.0434) [-0.12563]	76.08597 (99.9677) [0.76111]	40.65733 (41.9648) [0.96884]

When the results of vector error correction model are examined, it is found only one long run causality relationship between the variables. Then, short run causality is examined. Granger Causality test based on VECM is used to show the short run causality relationship between the variables.

### 3.2.3. Granger causality test

One of the causality tests based on lagged regression models is the Granger Causality Test. The causal link between variables must be confirmed by economic theory. Determining and testing the relationship between variables in economic theory depends primarily on determining whether the variables are internal or external. Granger (1969) found a causal concept of causality to determine the existence of causality and its direction between time series. This is known as Granger causality test.

Granger (1969) improved a test to control whether the containment of past values of a variable X develops the prediction of present values of variable Y. If the prediction of Y is developed by involving past values of X relative to only using the past values of Y, then X is said to Granger cause Y or vice versa. If both Y caused X and X caused Y, it can be saying a feedback relationship between X and Y (Granger, 1969).

According to Granger presentation theorem, if variables are first difference stationary and they are cointegrated, then there must be a at a minimum unidirectional Granger causality between the variables. Furthermore, adding of error correction term to the augmented version of Granger causality test shows the long run causal relation. Thus, the error correction term to the augmented version of Granger causality test is added (Ozer and Yeldan, 2016). Granger causality test based on VECM is formed:

$$\Delta_{EXPORTS_t} = \alpha_1 + \left[ \sum_{i=1}^p \beta_{1i} \Delta_{EXPORTS_{t-i}} + \gamma_{1i} \Delta_{IMPORTS_{t-i}} + \delta_{1i} \Delta_{GDP_{t-i}} + \theta_{1i} \Delta_{INTM_{t-i}} + \mu_{1i} \Delta_{CAPM_{t-i}} + \sigma_{1i} \Delta_{CONSM_{t-i}} \right] + \varphi_1 ect_{1t-1} + \varepsilon_{1t} \quad (3.8)$$

$$\Delta_{IMPORTS_t} = \alpha_2 + \left[ \sum_{i=2}^p \beta_{2i} \Delta_{EXPORTS_{t-i}} + \gamma_{2i} \Delta_{IMPORTS_{t-i}} + \delta_{2i} \Delta_{GDP_{t-i}} + \theta_{2i} \Delta_{INTM_{t-i}} + \mu_{2i} \Delta_{CAPM_{t-i}} + \sigma_{2i} \Delta_{CONSM_{t-i}} \right] + \varphi_2 ect_{2t-1} + \varepsilon_{2t} \quad (3.9)$$

$$\Delta_{GDP_t} = \alpha_3 + \left[ \sum_{i=3}^p \beta_{3i} \Delta_{EXPORTS_{t-i}} + \gamma_{3i} \Delta_{IMPORTS_{t-i}} + \delta_{3i} \Delta_{GDP_{t-i}} + \theta_{3i} \Delta_{INTM_{t-i}} + \mu_{3i} \Delta_{CAPM_{t-i}} + \sigma_{3i} \Delta_{CONSM_{t-i}} \right] + \varphi_3 ect_{3t-1} + \varepsilon_{3t} \quad (3.10)$$

$$\Delta_{INTM_t} = \alpha_4 + \left[ \sum_{i=4}^p \beta_{4i} \Delta_{EXPORTS_{t-i}} + \gamma_{4i} \Delta_{IMPORTS_{t-i}} + \delta_{4i} \Delta_{GDP_{t-i}} + \theta_{4i} \Delta_{INTM_{t-i}} + \mu_{4i} \Delta_{CAPM_{t-i}} + \sigma_{4i} \Delta_{CONSM_{t-i}} \right] + \varphi_4 ect_{4t-1} + \varepsilon_{4t} \quad (3.11)$$

$$\Delta_{CAPM_t} = \alpha_5 + \left[ \sum_{i=5}^p \beta_{5i} \Delta_{EXPORTS_{t-i}} + \gamma_{5i} \Delta_{IMPORTS_{t-i}} + \delta_{5i} \Delta_{GDP_{t-i}} + \theta_{5i} \Delta_{INTM_{t-i}} + \mu_{5i} \Delta_{CAPM_{t-i}} + \sigma_{5i} \Delta_{CONSM_{t-i}} \right] + \varphi_5 ect_{5t-1} + \varepsilon_{5t} \quad (3.12)$$

$$\Delta_{CONSM_t} = \alpha_6 + \left[ \sum_{i=6}^p \beta_{6i} \Delta_{EXPORTS_{t-i}} + \gamma_{6i} \Delta_{IMPORTS_{t-i}} + \delta_{6i} \Delta_{GDP_{t-i}} + \theta_{6i} \Delta_{INTM_{t-i}} + \mu_{6i} \Delta_{CAPM_{t-i}} + \sigma_{6i} \Delta_{CONSM_{t-i}} \right] + \varphi_6 ect_{6t-1} + \varepsilon_{6t} \quad (3.13)$$

### 3.2.3.1. Granger causality test results

Granger causality test analysed the existence of causal link and the direction of the link between the variables. Granger causality test results for short run is as follows.

**Table 3.5.** The results of the VECM Granger causality test for short run

<b>Dependent Variable: D(CAMP_SA)</b>			
<b>Independent Variable</b>	<b>Chi-sq</b>	<b>df</b>	<b>Probability</b>
D(CONSM_SA)	21.89548	2	0.0000
D(EXPORTS_SA)	1.032563	2	0.5967
D(GDP_SA)	2.227062	2	0.3284
D(IMPORTS_SA)	2.461176	2	0.2921
D(INTM_SA)	1.670704	2	0.4337
All	34.56386	10	0.0001
<b>Dependent Variable: D(CONSM_SA)</b>			
<b>Independent Variable</b>	<b>Chi-sq</b>	<b>df</b>	<b>Probability</b>
D(CAPM_SA)	0.725864	2	0.6956
D(EXPORTS_SA)	8.695344	2	0.0129
D(GDP_SA)	23.30186	2	0.0000
D(IMPORTS_SA)	1.470157	2	0.4795
D(INTM_SA)	1.823160	2	0.4019
All	35.36656	10	0.0001
<b>Dependent Variable: D(EXPORTS_SA)</b>			
<b>Independent Variable</b>	<b>Chi-sq</b>	<b>df</b>	<b>Probability</b>
D(CAPM_SA)	4.840225	2	0.0889
D(CONSM_SA)	3.798462	2	0.1497
D(GDP_SA)	2.716419	2	0.2571
D(IMPORTS_SA)	7.741751	2	0.0208
D(INTM_SA)	9.873727	2	0.0072
All	18.72298	10	0.0439

**Table 3.5. (Continued)** *The results of the VECM Granger causality test for short run*

<b>Dependent Variable: D(GDP_SA)</b>			
<b>Independent Variable</b>	<b>Chi-sq</b>	<b>df</b>	<b>Probability</b>
D(CAPM_SA)	0.561016	2	0.7554
D(CONSM_SA)	3.869012	2	0.1445
D(EXPORTS_SA)	1.665795	2	0.4348
D(IMPORTS_SA)	0.775357	2	0.6786
D(INTM_SA)	1.620473	2	0.4448
All	14.58960	10	0.1478
<b>Dependent Variable: D(IMPORTS_SA)</b>			
<b>Independent Variable</b>	<b>Chi-sq</b>	<b>df</b>	<b>Probability</b>
D(CAPM_SA)	4.937619	2	0.0847
D(CONSM_SA)	22.44250	2	0.0000
D(EXPORTS_SA)	0.262938	2	0.8768
D(GDP_SA)	8.611595	2	0.0135
D(INTM_SA)	12.93437	2	0.0016
All	40.18998	10	0.0000
<b>Dependent Variable: D(INTM_SA)</b>			
<b>Independent Variable</b>	<b>Chi-sq</b>	<b>df</b>	<b>Probability</b>
D(CAPM_SA)	4.273468	2	0.1180
D(CONSM_SA)	16.16399	2	0.0003
D(EXPORTS_SA)	0.199781	2	0.9049
D(GDP_SA)	5.954315	2	0.0509
D(IMPORTS_SA)	10.44734	2	0.0054
All	31.14735	10	0.0006

According to Granger causality test, if probability value is smaller than 0.05,  $H_0$  hypothesis is rejected or if probability value is higher than 0.05,  $H_0$  hypothesis is accepted. Accepting  $H_0$  hypothesis indicates that there is no causality in the specified direction, while rejecting  $H_0$  hypothesis indicates there is causality in the specified direction.

According to short run causality test results, there is causal relationship from imported consumption good to imported capital good, from exports and GDP to imported consumption good, from imported capital good, imports and imported intermediate good to exports, from imported consumption good, GDP and imported intermediate good to

imports, from imported consumption good, GDP and import to imported intermediate good. However, there is no found causality from any variables to GDP.

For both short and long run causality test results is summarized in Table 3.6..

**Table 3.6.** *The results of the VECM Granger causality test both short and long run*

DEPENDENT VARIABLE	SHORT RUN CHI-SQ						LONG RUN
	D(CAPM_SA)	D(CONSUM_SA)	D(EXPORTS_SA)	D(GDP_SA)	D(IMPORTS_SA)	D(INTM_SA)	
D(CAPM_SA) Model 1	-----	21.89548	1.032563	2.227062	2.461176	1.670704	-----
D(CONSUM_SA) Model 2	0.725864	-----	8.695344	23.30186	1.470157	1.823160	-----
D(EXPORTS_SA) Model 3	4.840225	3.798462	-----	2.716419	7.741751	9.873727	-----
D(GDP_SA) Model 4	0.561016	3.869012	1.665795	-----	0.775357	1.620473	-1.821
D(IMPORTS_SA) Model 5	4.937619	22.44250	0.262938	8.611595	-----	12.93437	-----
D(INTM_SA) Model 6	4.273468	16.16399	0.199781	5.954315	10.44734	-----	-----

All variables that are selected as dependent variable is shown in table 3.6.. As a result of long run estimations, error variable parameter is found significant for only Model 4. So, it means that export, import, and sub-group of imports affect GDP in the long run. The causality relationship between variables is summarized as follows.

**Table 3.7.** *The causal relationship between variables*

<b>Null Hypothesis</b>	<b>Chi-sq</b>	<b>Probability</b>
CONSM does not Granger cause CAPM.	21.89548	<b>0.0000</b>
EXPORT does not Granger cause CAPM.	1.032563	0.5967
GDP does not Granger cause CAPM.	2.227062	0.3284
IMPORT does not Granger cause CAPM.	2.461176	0.2921
INTM does not Granger cause CAPM.	1.670704	0.4337
CAPM does not Granger cause CONSM.	0.725864	0.6956
EXPORT does not Granger cause CONSM.	8.695344	<b>0.0129</b>
GDP does not Granger cause CONSM.	23.30186	<b>0.0000</b>
IMPORT does not Granger cause CONSM.	1.470157	0.4795
INTM does not Granger cause CONSM.	1.823160	0.4019
CAPM does not Granger cause EXPORT.	4.840225	0.0889
CONSM does not Granger cause EXPORT.	3.798462	0.1497
GDP does not Granger cause EXPORT.	2.716419	0.2571
IMPORT does not Granger cause EXPORT.	7.741751	<b>0.0208</b>
INTM does not Granger cause EXPORT.	9.873727	<b>0.0072</b>
CAPM does not Granger cause GDP.	0.561016	0.7554
CONSM does not Granger cause GDP.	3.869012	0.1445
EXPORT does not Granger cause GDP.	1.665795	0.4348

**Table 3.7. (Continued)** *The causal relationship between variables*

IMPORT does not Granger cause GDP.	0.775357	0.6786
INTM does not Granger cause GDP.	1.620473	0.4448
CAPM does not Granger cause IMPORT.	4.937619	<b>0.0847</b>
CONSM does not Granger cause IMPORT.	22.44250	<b>0.0000</b>
EXPORT does not Granger cause IMPORT.	0.262938	0.8768
GDP does not Granger cause IMPORT.	8.611595	<b>0.0135</b>
INTM does not Granger cause IMPORT.	12.93437	<b>0.0016</b>
CAPM does not Granger cause INTM.	4.273468	0.1180
CONSM does not Granger cause INTM.	16.16399	<b>0.0003</b>
EXPORT does not Granger cause INTM.	0.199781	0.9049
GDP does not Granger cause INTM.	5.954315	<b>0.0509</b>
IMPORT does not Granger cause INTM.	10.44734	<b>0.0054</b>

The causality between variables, its direction and statistical significance are given in Table 3. 6.. The statistic values shown in bold in the table indicate that the hypothesis is rejected. According to table, there is no causal link from export or import to GDP. It highlights export-led growth or import-led growth hypothesis are not valid in Turkey. However, a reverse link, which is causality from GDP to import, was found. It indicates that growth-led import hypothesis for Turkey can be mentioned. Growth-led hypothesis means that imports will increase when growth increases or vice versa.

In addition, causal relationship was found from GDP to imported consumption and intermediate good. So, it can be said that economic growth affects both imports and subgroup of imports, except imported capital goods.

The causal relationship from subgroup of imports to import is another result. Any increase/decrease in imported consumption, intermediate and capital goods will lead to increase/decrease in imports. Also, bidirectional causality was found between imported intermediate good and imports. So, while imported intermediate goods have already affected imports, imports will also affect imported intermediate goods.

The causal relationship from export to imported consumption goods shows that export affects directly imported consumption goods and also indirectly affect imported capital and intermediate goods because of the causality link from imported consumption goods to imported capital and intermediate goods.

In conclusion, it is achieved the result that the analysis is investigated. The causal relationship from imports to export highlights import dependence of exports in Turkey.

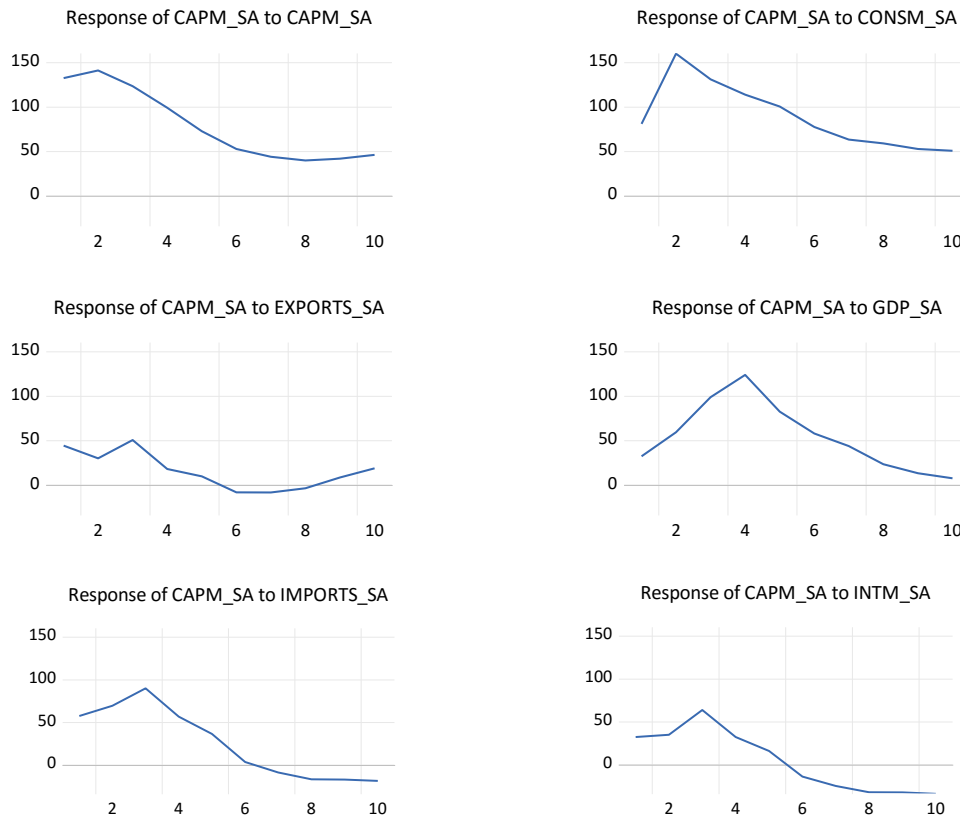
#### **3.2.4. Impulse-response function**

Granger causality test may not explain the interactions between the variables. So, Impulse-Response Function (IRF) graphs are used to interpret the results. Impulse-Response Function is used to examine the effect of a shock that consists in a variable on the other variables of the model (Kumari and Malhotra, 2016). Unexpected shock is represented by error terms (Kurt and Terzi, 2007).

In addition, impulse-response function can help to determine the sign of the Granger causality. It is required to look at the sign of IRFs for whole periods for finding out the sign of Granger causality. If the response function is positive for all periods, this should be taken as an evidence of positive causality. However, if it is positive and so negative, and then finally dampens down, it may be evaluated as a sign of nonexistence of an obvious sign of causality. So, it can be interpreted that the sign of causality depends on the time horizon (Ozer and Yeldan, 2016).

##### ***3.2.4.1. Impulse-response function results***

When a standard deviation shock is given to the variables in the model, the response of the other variables is measured by the IRF. IRF can help to determine the sign of the Granger causality. It is required to look at the sign of IRF for whole periods for finding out the sign of Granger causality. The plots the impulse responses of VECM for the variables are as follows.



**Figure 3.3.** *Impulse responses to generalized one standard deviation innovations according to the VECM of seasonally adjusted imported capital good*

The first graph of figure 3.3. shows the response of the imported capital goods variable to the shock occurring on itself. In beginning, this effect rise, goes to peak in 2<sup>nd</sup> time horizon, then starts fall after 6<sup>th</sup> time horizon.

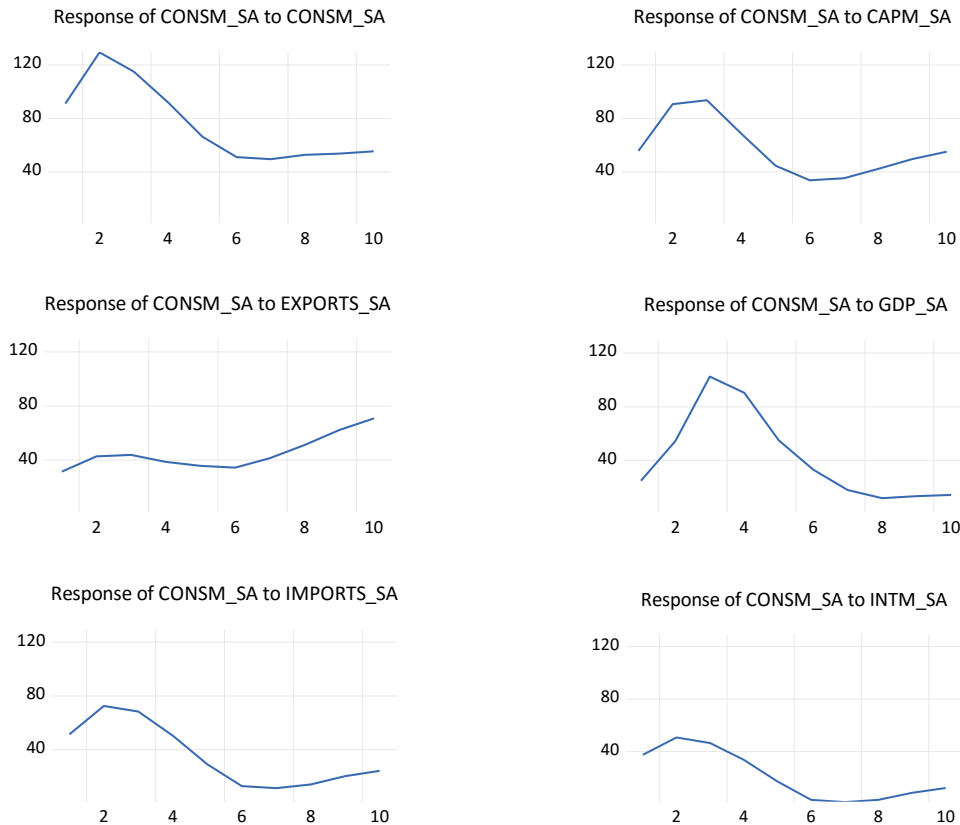
In the second graph, the impact of the shocks in the CAPM variable on the CONSM variable is seen. Firstly, it rises to peak in 2<sup>nd</sup> time horizon, and then starts to fall till 10<sup>th</sup> time horizon.

The impact of shock in the CAPM variable on the EXPORT variable declines to 2<sup>nd</sup> time horizon, after rise 3<sup>th</sup> time horizon, then decline 6<sup>th</sup> time horizon finally after 8<sup>th</sup> time horizon rises in the third graph.

In the fourth graph, the impact of the shock in the CAPM variable on the GDP variable rises 4<sup>th</sup> time horizon then starts to decline 10<sup>th</sup> time horizon.

In the fifth graph, the impact of the shock in the CAPM variable on the IMPORT variable is seen. First, it rises to peak in 3<sup>th</sup> time horizon, then starts to fall 10<sup>th</sup> time horizon.

In the last graph of figure 3.3., the effect of the shock in the CAPM variable on the INTM variable rises from 2<sup>nd</sup> to 3<sup>th</sup> time horizon, after starts to decline 10<sup>th</sup> time horizon.



**Figure 3.4.** *Impulse responses to generalized one standard deviation innovations according to the VECM of seasonally adjusted imported consumption good*

The first graph of figure 3.4. shows the response of imported consumption goods variable to the shock on itself. Firstly, this effect rises to peak in 2<sup>nd</sup> time horizon, after declines to 6<sup>th</sup> time horizon, then continues steadily.

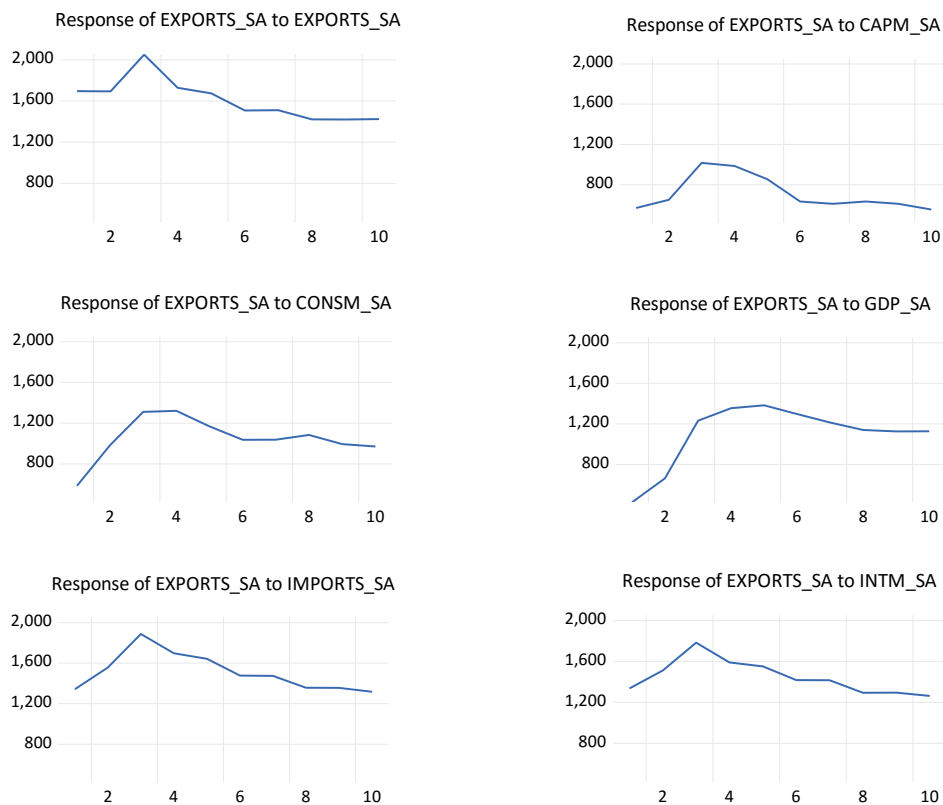
In the second graph, it is seen the impact of the shock in the CONSM variable on the CAPM variable. First, it rises 2<sup>nd</sup> time horizon, after 3<sup>th</sup> time horizon declines, then after 6<sup>th</sup> time horizon rises again.

The impact of shock in the CONSM variable on the EXPORT variable rises 2<sup>nd</sup> time horizon and starts to decline after 3<sup>th</sup> time horizon, then rises after 6<sup>th</sup> time horizon.

In the fourth graph, the impact of the shock in the CONSM variable on the GDP variable rises 3<sup>th</sup> time horizon, then starts to decline till 8<sup>th</sup> time horizon and continues steadily.

In the fifth graph, it is seen the impact of the shock in the CONSM variable on the IMPORT variable. First, it rises to peak in 2<sup>nd</sup> time horizon, then starts to fall 3<sup>th</sup> time horizon. Finally, it rises again after 8<sup>th</sup> time horizon.

In the last graph of figure 3.4., the effect of the shock in the CONSM variable on the INTM variable rises 2<sup>nd</sup> time horizon, after starts to decline from 3<sup>th</sup> to 6<sup>th</sup> time horizon. It continues steadily from 6<sup>th</sup> to 8<sup>th</sup> time horizon. Finally, it rises again after 8<sup>th</sup> time horizon.



**Figure 3.5.** *Impulse responses to generalized one standard deviation innovations according to the VECM of seasonally adjusted exports*

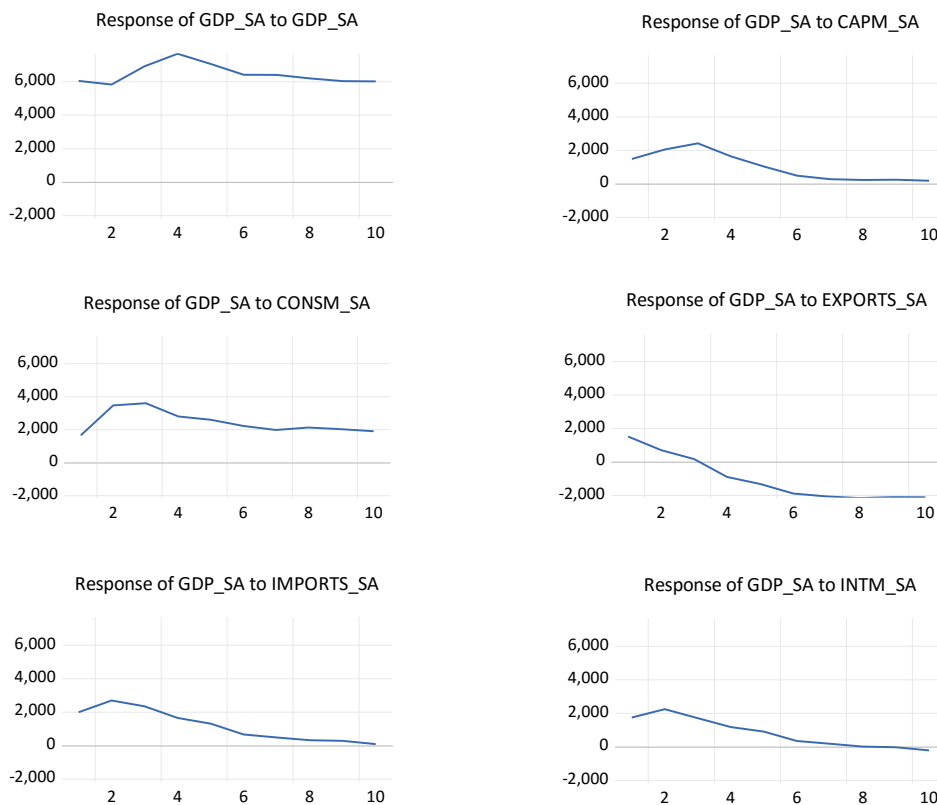
The first graph of figure 3.5. shows the response of export variable to the shock occurring on itself. In beginning, this effect rises from 2<sup>nd</sup> to 3<sup>th</sup> time horizon, after 3<sup>th</sup> time horizon the effect continues with ups and downs.

In the second graph, it is seen the impact of the shocks in the export variable on the CAPM variable. Firstly, it raises 3<sup>th</sup> time horizon, then starts to fall till 6<sup>th</sup> time horizon and goes on steadily.

The impact of shock in the export variable on the CONSM variable rises to 3<sup>th</sup> time horizon and goes on steadily till 4<sup>th</sup> time horizon, then declines 6<sup>th</sup> time horizon and goes on steadily again.

In the fourth graph, the impact of the shock in the export variable on the GDP variable rises 5<sup>th</sup> time horizon then starts to decline slowly.

In the fifth graph, the impact of the shock in the export variable on the IMPORT variable is seen. First, it rises to peak in 3<sup>th</sup> time horizon, and then continues with ups and downs. Also, the effect of the shock in the export variable on the INTM variable shows the same effect with import variable.



**Figure 3.6.** *Impulse responses to generalized one standard deviation innovations according to the VECM of seasonally adjusted GDP*

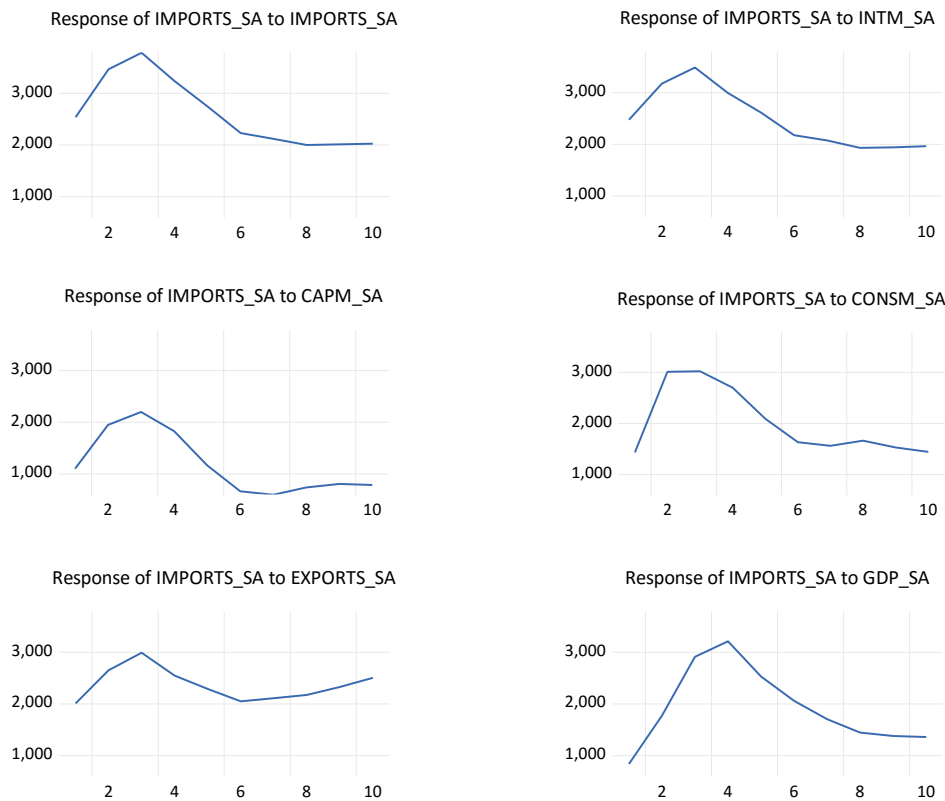
First graph of figure 3.6. shows the response of GDP variable to the shock on itself. Firstly, this effect rises from 2<sup>nd</sup> to 3<sup>th</sup> time horizon and declines from 3<sup>th</sup> to 6<sup>th</sup> time horizon, then continues to down.

In the second graph, it is seen the impact of the shock in the GDP variable on the CAPM variable. First, it rises 3<sup>th</sup> time horizon, after declines till 6<sup>th</sup> time horizon, then continues to down.

The impact of shock in the GDP variable on the CONSM variable rises 3<sup>th</sup> time horizon and starts to decline after 3<sup>th</sup> time horizon.

In the fourth graph, the impact of the shock in the GDP variable on the export variable is seen. This effect is a continuous reduction.

In the fifth graph, it is seen the impact of the shock in the GDP variable on the IMPORT variable. First, it rises from 1<sup>st</sup> to 2<sup>nd</sup> time horizon, and then starts to fall. Also, it is same the impact of the shock in the GDP variable on the INTM variable.



**Figure 3.7.** Impulse responses to generalized one standard deviation innovations according to the VECM of seasonally adjusted imports

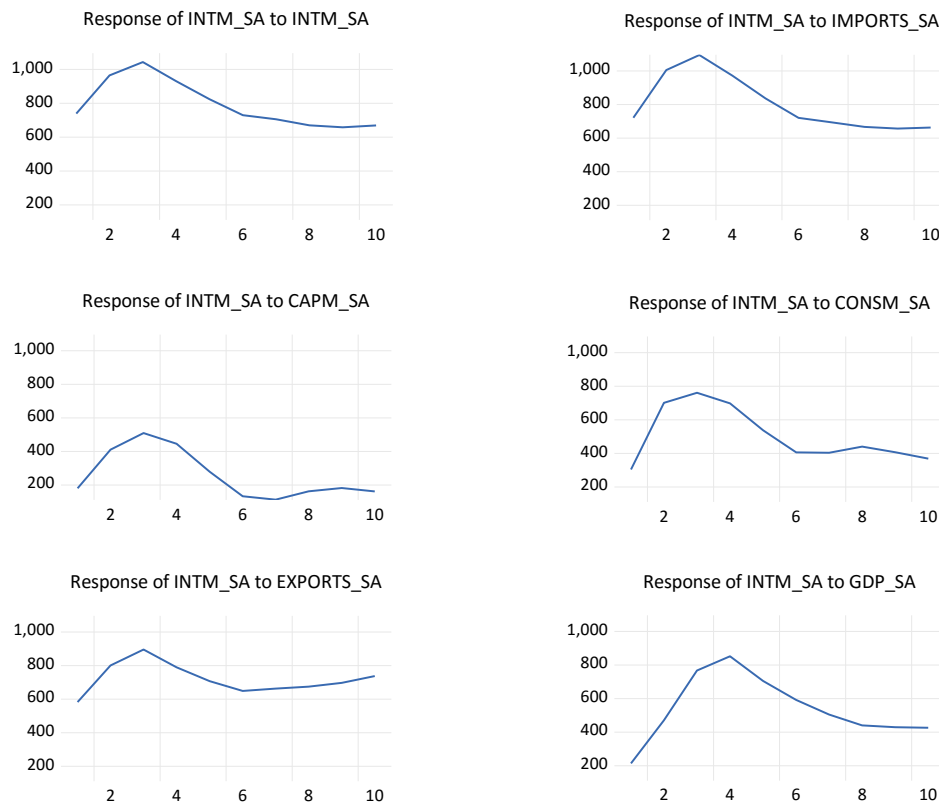
The first graph of figure 3.7. shows the response of the IMPORT variable to the shock occurring on itself. In beginning, this effect rise, goes to peak in 3<sup>th</sup> time horizon, then starts to fall. Also, it is same the impact of the shock in the IMPORT variable on the INTM variable as is seen the second plot of figure 3.7.

The impact of shock in the IMPORT variable on the CAPM variable rises 2<sup>nd</sup> time horizon, then declines till 6<sup>th</sup> time horizon finally declines 6<sup>th</sup> time horizon rises slowly in third plot.

In the fourth graph, the impact of the shock in the IMPORT variable on the CONSM variable rises 2<sup>nd</sup> time horizon after 3<sup>th</sup> time horizon starts to decline.

In the fifth graph, it is seen the impact of the shock in the IMPORT variable on the EXPORT variable. First, it rises to peak in 3<sup>th</sup> time horizon, then starts to fall 6<sup>th</sup> time horizon, finally rises again.

In the last graph of figure 3.7., the effect of the shock in the IMPORT variable on the GDP variable rises 4<sup>th</sup> time horizon, after starts to decline.



**Figure 3.8.** Impulse responses to generalized one standard deviation innovations according to the VECM of seasonally adjusted imported intermediate good

The first graph of figure 3.8. shows the response of the INTM variable to the shock occurring on itself. In beginning, this effect rise, goes to peak in 3<sup>th</sup> time horizon, and then starts to fall. Also, it is same the impact of the shock in the INTM variable on the IMPORT variable as is seen the second plot of figure 3.8.

The impact of shock in the INTM variable on the CAPM variable rises 3<sup>th</sup> time horizon, then declines till 7<sup>th</sup> time horizon finally it rises slowly in third plot.

In the fourth graph, the impact of the shock in the INTM variable on the CONSM variable rises 3<sup>th</sup> time horizon then from 3<sup>th</sup> to 7<sup>th</sup> time horizon starts to decline and goes on with ups and downs.

In the fifth graph, it is seen the impact of the shock in the INTM variable on the EXPORT variable. First, it rises to peak in 3<sup>th</sup> time horizon, then starts to fall 6<sup>th</sup> time horizon, finally rises again.

### **3.2.5. Variance decomposition analysis**

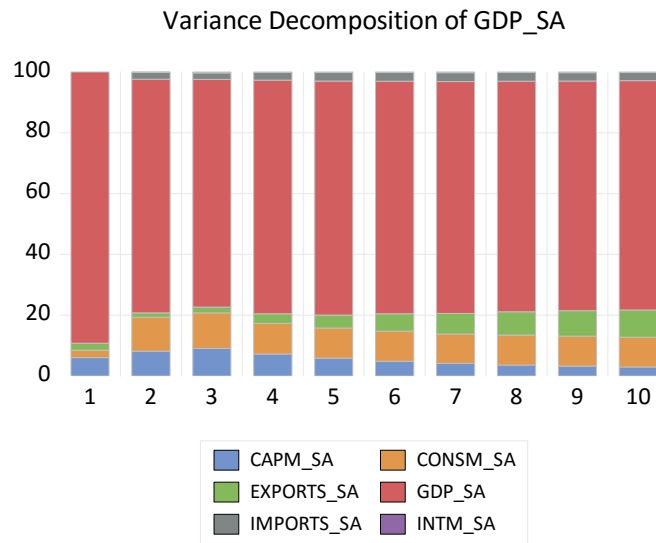
Variance Decomposition Analysis (VDA) is used to measure in proportion the effects of shocks on their variables by distributing the estimate error variance of all variables between each of the variables (Catalbas, 2016; Kumari and Malhotra, 2016). So, the primary objective of each shock is to find out the effect of variables on predictive error variances in the future. Forecast error decomposition refers to the percentage of error variation that occurs in a prediction of a variable in a time interval depending on a particular shock. Therefore, it can be defined as a partial  $R^2$  depending on the prediction period length for prediction error (Stock and Watson, 2001).

Variance decomposition also provides information about the externality of variables. According to Enders (2004), for instance, in the case of two variables, if  $\varepsilon_{zt}$  shocks do not explain any prediction error variance of  $y_t$  in all predictive dimension, it can be said that exogeneous for  $y_t$ . Under these conditions, the  $y_t$  variable moves independently the  $\varepsilon_t$  shocks and  $y_t$  variables. In another case, it can be defined  $y_t$  as endogeneous. In practice, the variable often describes almost all of its predictive error variance in the short run and also in the long run it explains smaller ratio. Impulse-response functions and variance decomposition provide useful tools for examining the relationships between economic variables. As long as the correlation between the

residuals of the equations in the VAR model remains low, the different rankings that give the necessary constraints to obtain the impulse-response functions and the variance decomposition will get similar results.

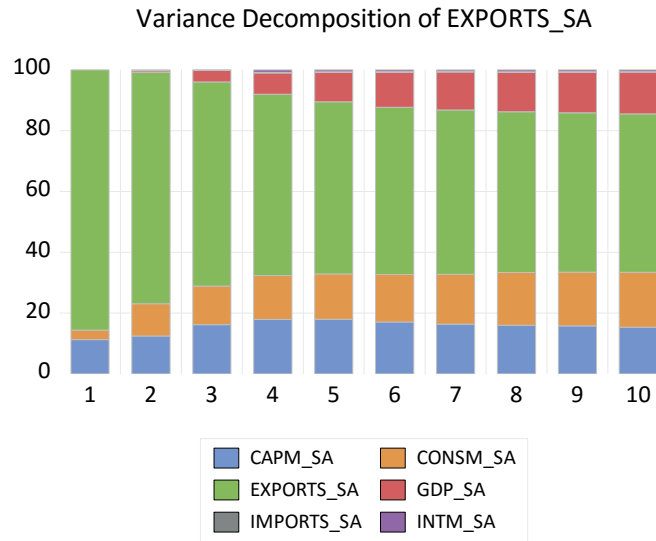
### 3.2.5.1. Variance decomposition analysis results

The variance decomposition reflects the shocks on the variables and on the other variables as a percentage. It is checked whether the causality is valid beyond the sample period. The results of variance decomposition of all variables are as follows.



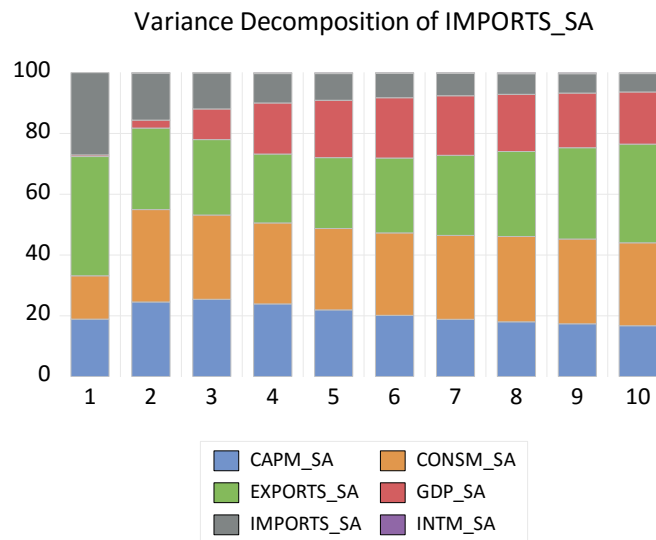
**Figure 3.9.** Plots of variance decomposition of GDP

When the variance decomposition results of GDP variable in figure 3.9. is examined, GDP is mostly explained by its own. According to Granger causality test results, it is acceptable. Because none of the variables can affect GDP.



**Figure 3.10.** Plot of variance decomposition of exports

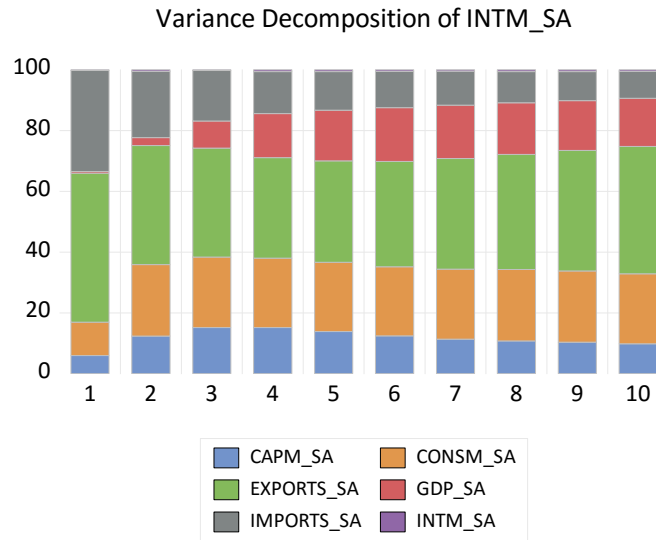
When the variance decomposition results of export variable in figure 3.10. is examined, export is mostly explained by its own. However, imported capital and consumption goods explain export in the forthcoming periods. According to Granger causality test results, only CAPM variable explains export beyond sample period.



**Figure 3.11.** Plot of variance decomposition of imports

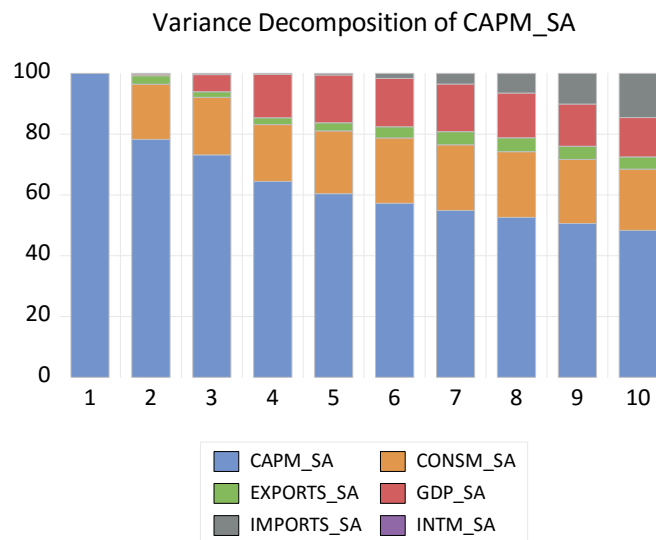
When the variance decomposition results of import variable in figure 3.11. is examined, import is mostly explained by export, imported capital and consumption

goods. According to Granger causality test, CONSM and GDP variable explain export beyond sample period. However, GDP variable explain less than CONSM variable beyond sample period.



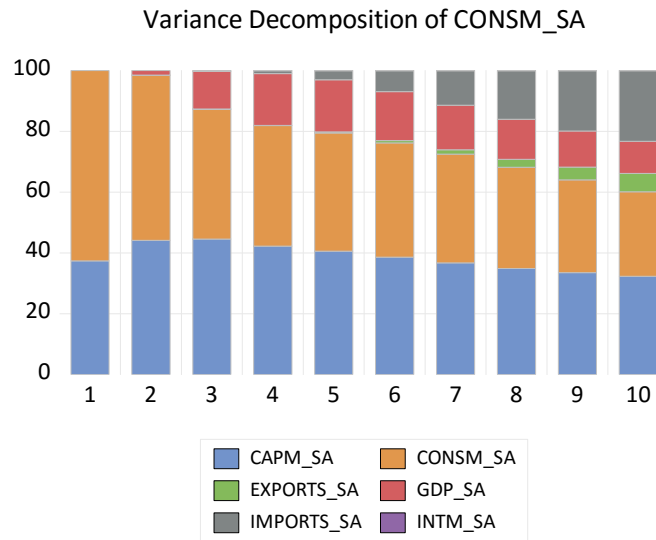
**Figure 3.12.** Plot of variance decomposition of imported intermediate good

When the variance decomposition results of INTM variable in figure 3.12. is examined, imported intermediate good is explained mostly by export and imported consumption goods, and a little by GDP. According to Granger causality test results, CONSM and GDP variable explain INTM variables beyond sample period.



**Figure 3.13.** Plot of variance decomposition of imported capital good

When the variance decomposition results of CAPM variable in figure 3.13. is investigated, imported capital good is mostly explained by its own and imported intermediate good. However, the results of Granger causality test is compared, none of the variables affect CAPM variable beyond sample period.



**Figure 3.14.** *Plot of variance decomposition of imported consumption good*

When the variance decomposition results of CONSM variable in figure 3.14. is investigated, imported consumption goods are mostly explained by its own and imported capital goods. However, when the results of Granger causality test are compared, none of variables affect CONSM variable beyond sample period.

### 3.3. Conclusion

In this study, it is aimed to examine the validity of Turkey's import dependency of export in the period of 1998:1-2018:3 applying Johansen cointegration test, vector error correction model, Granger causality test, impulse-response function, and variance decomposition analysis.

First of all, results show that it is not possible to export without import for Turkey. Because there is causality from import to export. When all results are evaluated together, there is no causality in export-led or import-led growth hypothesis. On the contrary, causal link from economic growth to import is found to indicate the growth-led import

hypothesis. According to this results, economic growth does not cause export. Export and import do not cause economic growth. So, an increase in import/export does not cause economic growth. This result is mostly related to Turkey's export structure. There are not enough Research and Developments activities to develop new technologies and products. Export sectors provide only foreign exchange which used in the recruitment of raw materials and intermediate goods which are needed for production. This does not directly contribute to economic growth. On the other hand, economic growth cannot increase export.

Economic growth is the cause of import and subgroup of import, except imported capital good. To produce goods which are exported, Turkey provides raw material and intermediate goods via import. This led to increase in production. While this is expected to increase growth, it is not achieved in the analysis. On the other hand, import increases as economic growth increase income level and demand. Because of the causal link from growth to imported consumption and intermediate goods, it can be said that growth also increases them. Accordingly, Turkey is required to shift exports from intermediate goods to high value-added and high technology capital and final consumption goods. Thus, Turkey can provide export-led growth. Economic growth rate should be followed carefully and increased in accordance with program objectives. In this respect, increasing investment is important. A stable and secure environment should be provided.

Because of import dependency of export, new markets should be searched, especially where intermediate goods will be purchased at cheaper costs. Imports are a key point in increasing production. According to this situation, the competition in foreign companies due to import may also affect domestic firms. This can enable domestic companies to produce high quality and various products. So, production should be encouraged, and incentives should be given to the domestic firms.

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## APPENDIX

### Appendix-1: VECM Test

Vector Error Correction Estimates  
 Date: 03/20/19 Time: 11:29  
 Sample (adjusted): 1998Q4 2018Q3  
 Included observations: 80 after adjustments  
 Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1	CointEq2	CointEq3		
CAPM_SA(-1)	1.000000	0.000000	0.000000		
CONSM_SA(-1)	0.000000	1.000000	0.000000		
EXPORTS_SA(-1)	0.000000	0.000000	1.000000		
GDP_SA(-1)	-0.000207 (0.00050) [-0.41290]	0.000164 (0.00051) [ 0.32057]	-0.042815 (0.00976) [-4.38541]		
IMPORTS_SA(-1)	-0.192314 (0.01461) [-13.1624]	-0.148366 (0.01496) [-9.91948]	-0.466829 (0.28490) [-1.63855]		
INTM_SA(-1)	0.606601 (0.05559) [ 10.9115]	0.425754 (0.05691) [ 7.48121]	-0.297156 (1.08402) [-0.27412]		
C	-145.6087	187.7697	7516.970		
Error Correction:	D(CAPM_SA)	D(CONSM_SA)	D(EXPORTS_SA)	D(GDP_SA)	D(IMPORTS_SA)
CointEq1	-0.539563 (0.70837) [-0.76170]	-0.056589 (0.48632) [-0.11636]	8.874077 (9.04959) [ 0.98060]	-8.487421 (32.2596) [-0.26310]	3.620995 (13.5420) [ 0.26739]
CointEq2	0.518043 (0.70217) [ 0.73777]	-0.089441 (0.48207) [-0.18553]	10.59386 (8.97050) [ 1.18097]	3.532553 (31.9776) [ 0.11047]	11.49793 (13.4237) [ 0.85654]
CointEq3	-0.012970 (0.01249) [-1.03818]	0.031842 (0.00858) [ 3.71241]	-0.101167 (0.15960) [-0.63386]	-1.036109 (0.56895) [-1.82110]	0.198427 (0.23883) [ 0.83081]
D(CAPM_SA(-1))	0.044099 (0.56357) [ 0.07825]	0.271831 (0.38692) [ 0.70256]	-11.41647 (7.19982) [-1.58566]	13.18430 (25.6656) [ 0.51370]	-9.740529 (10.7740) [-0.90408]
D(CAPM_SA(-2))	-0.215593 (0.32256) [-0.66838]	0.057923 (0.22145) [ 0.26156]	-9.012762 (4.12082) [-2.18713]	1.079397 (14.6897) [ 0.07348]	-12.06230 (6.16650) [-1.95610]
D(CONSM_SA(-1))	0.850301 (0.58298) [ 1.45853]	0.449488 (0.40024) [ 1.12304]	-6.007190 (7.44780) [-0.80657]	26.04966 (26.5496) [ 0.98117]	2.790484 (11.1451) [ 0.25038]

D(CONSM_SA(-2))	-1.050397 (0.40498) [-2.59372]	-0.651516 (0.27803) [-2.34329]	-9.795309 (5.17372) [-1.89328]	-13.53228 (18.4430) [-0.73373]	-27.59407 (7.74208) [-3.56417]
D(EXPORTS_SA(-1))	-0.003923 (0.01783) [-0.22003]	-0.036053 (0.01224) [-2.94498]	-0.091753 (0.22780) [-0.40278]	-0.865383 (0.81206) [-1.06567]	-0.056909 (0.34089) [-0.16694]
D(EXPORTS_SA(-2))	0.012910 (0.01693) [ 0.76274]	-0.018036 (0.01162) [-1.55217]	0.256866 (0.21623) [ 1.18795]	0.095212 (0.77080) [ 0.12352]	0.111341 (0.32357) [ 0.34411]
D(GDP_SA(-1))	0.002375 (0.00301) [ 0.78939]	0.004862 (0.00207) [ 2.35412]	0.022539 (0.03843) [ 0.58643]	-0.152070 (0.13701) [-1.10992]	0.099247 (0.05751) [ 1.72561]
D(GDP_SA(-2))	0.004384 (0.00305) [ 1.43845]	0.009853 (0.00209) [ 4.70916]	0.063987 (0.03894) [ 1.64340]	0.039234 (0.13880) [ 0.28267]	0.161147 (0.05826) [ 2.76578]
D(IMPORTS_SA(-1))	-0.019161 (0.17933) [-0.10684]	-0.038392 (0.12312) [-0.31183]	3.554647 (2.29105) [ 1.55154]	-3.475355 (8.16702) [-0.42554]	3.783934 (3.42838) [ 1.10371]
D(IMPORTS_SA(-2))	0.069450 (0.09665) [ 0.71857]	0.022531 (0.06635) [ 0.33956]	3.115116 (1.23474) [ 2.52288]	0.153292 (4.40156) [ 0.03483]	4.841897 (1.84770) [ 2.62050]
D(INTM_SA(-1))	0.035759 (0.53049) [ 0.06741]	0.168839 (0.36420) [ 0.46359]	-10.60499 (6.77713) [-1.56482]	12.29009 (24.1588) [ 0.50872]	-11.33185 (10.1415) [-1.11738]
D(INTM_SA(-2))	-0.166016 (0.28162) [-0.58951]	-0.045527 (0.19334) [-0.23548]	-9.789582 (3.59776) [-2.72102]	-1.867581 (12.8251) [-0.14562]	-14.43973 (5.38378) [-2.68208]
C	-798.5449 (216.548) [-3.68761]	-330.4091 (148.669) [-2.22244]	419.6168 (2766.47) [ 0.15168]	-3866.189 (9861.77) [-0.39204]	-4538.459 (4139.81) [-1.09630]
RER	7.884485 (2.19512) [ 3.59182]	3.089047 (1.50704) [ 2.04974]	-3.523064 (28.0434) [-0.12563]	76.08597 (99.9677) [ 0.76111]	40.65733 (41.9648) [ 0.96884]
R-squared	0.640092	0.644930	0.329164	0.310967	0.569536
Adj. R-squared	0.548687	0.554753	0.158793	0.135975	0.460211
Sum sq. resids	1110302.	523331.1	1.81E+08	2.30E+09	4.06E+08
S.E. equation	132.7548	91.14188	1695.985	6045.768	2537.913
F-statistic	7.002810	7.151848	1.932040	1.777034	5.209599
Log likelihood	-495.0397	-464.9528	-698.8409	-800.5285	-731.0872
Akaike AIC	12.80099	12.04882	17.89602	20.43821	18.70218
Schwarz SC	13.30717	12.55500	18.40220	20.94439	19.20836
Mean dependent	17.51153	15.01635	447.9815	3207.027	512.2709
S.D. dependent	197.6112	136.5895	1849.143	6504.117	3454.338
Determinant resid covariance (dof adj.)		1.94E+31			
Determinant resid covariance		4.63E+30			
Log likelihood		-3505.503			
Akaike information criterion		90.63756			
Schwarz criterion		94.21060			
Number of coefficients		120			

## Appendix-2: Granger Causality Test Short Run

VEC Granger Causality/Block Exogeneity Wald Tests  
 Date: 03/20/19 Time: 11:30  
 Sample: 1998Q1 2018Q3  
 Included observations: 80

Dependent variable: D(CAPM\_SA)

Excluded	Chi-sq	df	Prob.
D(CONSM_SA)	21.89548	2	0.0000
D(EXPORTS_SA)	1.032563	2	0.5967
D(GDP_SA)	2.227062	2	0.3284
D(IMPORTS_SA)	2.461176	2	0.2921
D(INTM_SA)	1.670704	2	0.4337
All	34.56386	10	0.0001

Dependent variable: D(CONSM\_SA)

Excluded	Chi-sq	df	Prob.
D(CAPM_SA)	0.725864	2	0.6956
D(EXPORTS_SA)	8.695344	2	0.0129
D(GDP_SA)	23.30186	2	0.0000
D(IMPORTS_SA)	1.470157	2	0.4795
D(INTM_SA)	1.823160	2	0.4019
All	35.36656	10	0.0001

Dependent variable: D(EXPORTS\_SA)

Excluded	Chi-sq	df	Prob.
D(CAPM_SA)	4.840225	2	0.0889
D(CONSM_SA)	3.798462	2	0.1497
D(GDP_SA)	2.716419	2	0.2571
D(IMPORTS_SA)	7.741751	2	0.0208
D(INTM_SA)	9.873727	2	0.0072
All	18.72298	10	0.0439

Dependent variable: D(GDP\_SA)

Excluded	Chi-sq	df	Prob.
D(CAPM_SA)	0.561016	2	0.7554
D(CONSM_SA)	3.869012	2	0.1445
D(EXPORTS_SA)	1.665795	2	0.4348
D(IMPORTS_SA)	0.775357	2	0.6786
D(INTM_SA)	1.620473	2	0.4448
All	14.58970	10	0.1478

Dependent variable: D(IMPORTS\_SA)

Excluded	Chi-sq	df	Prob.
D(CAPM_SA)	4.937619	2	0.0847

D(CONSM_SA)	22.44250	2	0.0000
D(EXPORTS_SA)	0.262938	2	0.8768
D(GDP_SA)	8.611595	2	0.0135
D(INTM_SA)	12.93437	2	0.0016
All	40.18998	10	0.0000

Dependent variable: D(INTM\_SA)

Excluded	Chi-sq	df	Prob.
D(CAPM_SA)	4.273468	2	0.1180
D(CONSM_SA)	16.16399	2	0.0003
D(EXPORTS_SA)	0.199781	2	0.9049
D(GDP_SA)	5.954315	2	0.0509
D(IMPORTS_SA)	10.44734	2	0.0054
All	31.14735	10	0.0006