Hacettepe University Graduate School of Social Sciences
Department of Economics
Economics Master's Programme

THE J-CURVE ANALYSIS: EVIDENCE FROM THE BILATERAL TRADE BETWEEN TURKEY AND EURO AREA

Elif ÖNGÖR HORATA

Master's Thesis

Ankara, 2019

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ACCEPTANCE AND APPROVAL

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20/06/2019

Elif ÖNGÖR HORATA

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ETİK BEYAN

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ABSTRACT

ÖNGÖR HORATA, Elif. *The J-Curve Analysis: Evidence from the Bilateral Trade between Turkey and Euro Area*, Master's Thesis, Ankara, 2019.

This thesis aims to investigate the validity of the J-curve hypothesis for the bilateral trade between Turkey and Euro Area. The short-run dynamics and long-run relations among variables are analyzing with the monthly data during the period of 2003M1-2018M12. Bounds Test approach depended on Autoregressive Distributed Lag model is used to find the cointegration relation among variables in the long-run. Also, The Error Correction Model is employed to determine short-run dynamics among variables. In the trade balance model, trade balance which is defined as the ratio of exports to imports is used as dependent variable while bilateral real exchange rate and industrial production indices as proxy for incomes of Turkey and Euro Area are employed as explanatory variables. The empirical results reveal that there is a cointegration relation among variables in the long-run. In addition, it is found that increases in real exchange rate affect positively trade balance both in the short-run and long-run. In other words, increases in real exchange rate (depreciation of Turkish Lira) improve trade balance both in the short-run and long-run. Therefore, it can be concluded that J-curve hypothesis is not valid for the bilateral trade between Turkey and Euro Area. According to findings of this study, income of Turkey does not have any impact on trade balance whereas income of Euro Area affects positively trade balance in the long-run.

Key Words: Foreign Trade Balance, Real Exchange Rate, J-Curve, ARDL Model, Bounds Test

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ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributed Lag
ASEAN	Association of Southeast Asian Nations
CBRT	Central Bank of the Republic of Turkey
CPI	Consumer Price Index
CUSUM	Cumulative Sum of Errors
CUSUMQ	Cumulative Sum of Squares Errors
EA	Euro Area
ECM	Error Correction Model
ECT	Error Correction Term
EFTA	European Free Trade Area
e.g.	for example (exempli gratia)
et al.	and others [et alii (masculine plural), et aliae (feminine plural) or et alia (neutral plural)]
etc.	and so forth (et cetera)
EU	European Union
EUROSTAT	Statistical Office of the European Union
EVDS	Electronic Data Delivery System
HLM	Harberger-Laursen-Metzler
IMF	International Monetary Fund
NAFTA	North American Free Trade Area
NARDL	Nonlinear Autoregressive Distributed Lag
NER	Nominal Exchange Rate

OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
RER	Real Exchange Rate
SIC	Schwarz Information Criterion
TL	Turkish Lira
TURKSTAT	Turkish Statistical Institute
UK	United Kingdom
US	United States of America
VAR	Vector Auto Regressions
VECM	Vector Error Correction Model

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INTRODUCTION

In the developing countries with underdeveloped capital markets, the fluctuations of foreign trade balance play a big role in current account balance as well as balance of payments. In order to decrease foreign trade deficit, the countries may implement either expenditure-reducing policies, including contractionary fiscal or monetary policy, or expenditure-switching policies, consisting of the currency devaluation/depreciation. The currency depreciation is adopted to shift the expenditures from abroad to domestic country. Therefore, the foreign trade balance is anticipated to recover. However, the response of the foreign trade balance to a depreciation in the short-run and long-run cannot be identical. Because of some adjustment lags, the expected recovery in the balance of trade after a devaluation cannot be occurred in the short-run, even the foreign trade balance can worsen. When adjustment starts to emerge, balance of foreign trade can improve after a while (in the long-run). This situation is examined under the notion of J-curve hypothesis. Turkey is small open economy and also classified as developing country. Therefore, developments of foreign trade balance influence the fundamentals of balance of payments. Hence, in Turkey devaluations were used as policy tools in many times to improve trade balance e.g. Turkish Lira (TL) was devalued in 1946, 1958, 1970, 1978, 1979, 1980, 1994 and 2001. In addition, after Turkey has started to implement floating exchange rate regime, TL depreciated due to domestic and global developments. Some of these devaluations and depreciations could be successful to increase exports and reduce imports but some of them could be failure. Therefore, study the J-curve is very important for Turkey because improvement in trade balance pursuing a depreciation can take time and some of depreciations cannot result in expected ways. When enough time passes after depreciation, trade balance can ameliorate itself after getting worsened in the sense of J-curve phenomenon. To determine whether the balance of trade after depreciation deteriorates or not is significant and to identify how long it takes to recover the trade balance is crucial for policy maker.

To utilize the effectiveness of the currency devaluation/depreciation on the balance of trade, Marshall–Lerner condition is studied because theoretical background of J-curve depends on this condition. In addition, Marshall–Lerner condition depends on the

elasticity approach. Marshall (1923), who is known as the founder of the elasticity approach, studied the relationship between the balance of trade and exchange rates with regard to elasticity approach. Then, Lerner (1944) developed this condition. Therefore, this condition has been called as "Marshall-Lerner" condition in the literature. According to this condition, if the sum of absolute values of the price elasticity of import and export demand exceeds unity which means that the exchange rate elasticity (price elasticity) of export and import volumes (demand) are strong enough, it is commonly expected that in the long-run the foreign trade balance will improve after a depreciation/devaluation. When domestic currency is depreciated, export prices will cut down in terms of foreign currency as the prices of import will escalate in terms of local currency. Then, volume of export will rise and volume of import will reduce, and so the trade balance is anticipated to recover.

However, the response of the trade balance to currency devaluation/depreciation in the short-run may be different due to the some adjustment lags. This situation is analyzed under the concept of the J-curve which is presented primarily by Magee (1973) who experiences that the US balance of trade worsened in spite of devaluation of the US dollar. The imports will be more expensive with respect to local currency and exports will be cheaper with respect to foreign currency after a devaluation/depreciation. On the other hand, volume of imports and exports will not adjust swiftly because of the some adjustment lags and stickiness in the short-run. Therefore, the balance of trade preliminarily worsens after a devaluation/depreciation of the local currency due to adjustment lags e.g. the insufficient price elasticities of export and import demand. When contracts start to be signed with new exchange rate and prices, volume of export and import start to adjust and hence volume of imports declines whereas volume of exports increases. In other words, the balance of trade deteriorates preliminarily due to price stickiness and then it improves because volume of export and import reverse adverse impact of local currency devaluation/depreciation against foreign currency. The pattern of trade balance likes the letter of J. So, it is started to be called "J-curve phenomenon" in the literature.

Impacts of the exchange rate changes on the balance of trade can be studied under Marshall-Lerner condition. Nevertheless, the analysts have tended to examine both the short-run relations and the long-run impacts and analyze the presence of the J-curve phenomenon since the J-curve was introduced. The validity of J-curve phenomenon for Turkey has been extensively studied. However, there is no common view among studies. The reason of this can be due to the fact that studies employ different methods, data structures and time periods in their models. Therefore, the validity of J-curve for Turkey can be analyzed for different time period and trading partner. In addition, export and import demand functions for Turkey in relation to the European Union (or Euro Area or some group of European Union countries) have been investigated. However, to the best of my knowledge, studies that analyze J-curve hypothesis for the Turkish bilateral trade with the Euro Area employing the Rose and Yellen (1989)'s model have not been encountered in the literature. Hence, it can be said that this thesis can give a contribution to the literature as this thesis can become the first study on this subject.

In this study, validity of J-curve for Tukey is investigated by analyzing influence of exchange rate developments on Turkish bilateral trade with the Euro Area (EA). This thesis may give a contribution for J-curve analysis regarding Turkish bilateral trade with the EA. The European Union (EU) is very important trading partner for Turkey. About half of Turkey's export is with the EU. In 2018, the share of EU in Turkey's total exports is 50% while the share of EU countries in Turkey's total imports was 36.2%. The bilateral trade volume between Turkey and the EU was $46.2 billion (exports $20.5 billion, imports $25.7 billion) in 2002. In 2018, trade volume has reached to $164.8 billion (exports $84 billion, imports $80.8 billion). The Euro Area is selected as a representation of Turkey's trading partner because all countries in the EU do not use the Euro as their currency and so do not include in the Euro Area. The Euro Area which constituted 34.5% of Turkey's export and 26.5% of Turkey's import in 2018 is also preferred to construct the bilateral real exchange rate of Turkey with Euro (described as the unit of Turkish Lira per unit of Euro). The trade balance equation relies on Rose and Yellen (1989)'s model in which the trade balance is dependent variable and is defined as exports to the EA over imports from the EA, bilateral real exchange rate and

domestic and foreign industrial production indices as proxy for domestic income and foreign income are explanatory variables.

The Autoregressive Distributed Lag (ARDL) and Bounds Test approach advanced by Pesaran et al. (2001) is adopted to analyze cointegration relations among variables in the long-run and Error Correction Model (ECM) in the short-run. Also, this approach allows both short-run dynamics and long-run relations to be calculated contemporaneously, that leads to a proper model to analyze validity of J-curve phenomenon.

In the period that is studied in this thesis, TL depreciated in real terms in many times. In the upcoming period, there can be further depreciation of TL. Therefore, it is very crucial to analyze J-curve phenomenon for Turkey and identify the impacts of depreciation of TL on the foreign trade especially bilateral trade with the EA because Turkey has close economic ties with the EA. For the policy maker, it can be important to determine that whether depreciation of TL can deteriorate bilateral trade between Turkey and the EA in the short-run and recover it in the long-run. Hence, this thesis can give a perspective to understand effectiveness of depreciation TL on bilateral trade between Turkey and the EA.

All in all, in this thesis presence of J-curve impact for bilateral trade between Turkey and the EA is studied. In chapter 1, the theoretical background of J-curve and literature review are given. In chapter 2, developments in Turkey's foreign trade policies as of certain periods are analyzed. In chapter 3, methodology of ARDL model and the model constructed for investigating existence of J-curve are introduced. Also, empirical results of this study are submitted. In conclusion, the discussions are made and the findings of the thesis are summarized.

CHAPTER 1

THE LITERATURE REVIEW OF J-CURVE PHENOMENON

In this chapter, the theoretical literature of J-curve is given firstly. Then, empirical literature can be separated into two parts; the studies which examine the presence of J-curve for countries other than Turkey and the studies which examine the validity of J-curve for Turkey.

1.1. THEORETICAL BACKGROUNG OF J-CURVE HYPOTHESIS

The theoretical framework of the J-curve hypothesis depends on Marshall–Lerner condition. Moreover, Marshall–Lerner condition is based on the elasticity approach.

The elasticity approach which is applied to observe the influence of exchange rate on trade balance considers responses to changing relative prices in terms of the substitution effects only. According to this approach, the price elasticity of demand is described as the responsiveness of the quantity demanded of goods or services to a change in its price. This approach assumes that incomes and prices of domestic and foreign countries remain unchanged and changes in relative prices among countries come from movements in the exchange rate only. This attitude tries to clarify whether a local currency depreciation/devaluation will ameliorate the foreign trade balance by using at price elasticities of the import and export demand functions. If the sum of absolute values of the price elasticity of import and export demand exceeds one, it is commonly believed that the balance of foreign trade will recover pursuing a depreciation/devaluation. This approach is known as the “Marshall-Lerner condition.” The development of the elasticity approach and Marshall-Lerner condition is attributed originally to Bickerdike (1920) who is accepted to be the first to give the full and correct conditions for exchange rate devaluation to ameliorate the trade balance (Gandolfo, 2002, p. 84). After Bickerdike, Marshall (1923), who is known as the founder of the elasticity approach, concerned the connection among the balance of trade

and exchange rates with regard to elasticity approach. Later extensions were made by Robinson (1937), Lerner (1944) and Metzler (1948).

The Marshall-Lerner condition depends on two presumptions. The first one is that the country's trade is in balance in an initial equilibrium (zero). The second assumption is that both export and import supply elasticities are infinite. In other words, it is predicted that the production of exported goods in the country and the production of goods imported from abroad can be increased in the desired amount and time (Kemeç and Kösekahyaoğlu, 2015). Hence, changes in the balance of trade are impacted only by the changes in the demand. Marshall-Lerner condition is based on two implicit assumptions as well. First, it requires that both the domestic and the foreign prices remain constant after devaluation/depreciation. Other implicit assumption behind this condition is that income levels of exporters and importers remain constant after devaluation/depreciation. Therefore, it is assumed that there is no income induced impacts on the balance of trade due to depreciation/devaluation. So, there is only the substitution effect that emerges (Kutlu, 2013).

The impact of changes in exchange rate can be examined in the framework of two basic effects, e.g. price effects and volume effects as regards the elasticity approach. The price effects reflect that when domestic currency is devalued (or depreciated), price of exports with regard to foreign currency will be relatively cheaper and price of imports with regard to domestic currency will be relatively expensive. This means that the total price effect on balance of trade will become adverse pursuing a devaluation or depreciation. The volume effects also come from the price effects. Volume of imports will decrease because they will be relatively more expensive in domestic currency whereas volume of exports will rise because they will be relatively cheaper in foreign currency after devaluation/depreciation. Therefore, the volume effects diminish imports and enhance exports. The volume effects will become favorable on balance of trade and hence operates in opposite way to the effect of price. The volume effect should outweigh the price effect to recover the balance of trade in the interest of devaluation or depreciation (Gupta-Kapoor and Ramakrishnan, 1999).

However, some studies show that it is not enough to explain the impacts of changes in exchange rate on the foreign trade balance by considering only the changes in the prices and volume of the goods with elasticities. These studies recommend that the income effect of such changes on balance of trade should be taken into consideration in the models in addition to price and volume effects (Göçer and Elmas, 2013; Türkay, 2014).

The first serious criticism of the condition of critical elasticity approach comes from Harberger (1950) and Laursen-Metzler (1950). The starting point of these writers is the neglect of the income movements that would arise from the movements in the relative prices of the goods subject to foreign trade. This alternative approach is known "Harberger-Laursen-Metzler Effect" (the HLM effect). There are two effects of exchange rates changes. The first one is "substitution effect." When a domestic currency is devalued, as in the case of the elasticity approach, substitution effect emerges because the domestic buyers change their spending from relatively expensive goods imported from abroad to the domestic goods. Hence, substitution effect gives contribution to improve the balance of trade. The second effect is "income effect." Terms of trade (the ratio of export prices to import prices) worsens because of devaluation of the local currency. Then, deterioration of the terms of trade diminishes real income, the alleviated real income decreases saving and this affects trade balance adversely. Hence, income effect, unlike to substitution effect, gives negative contribution and worsens the balance of trade. This income effect is considered as the HLM effect.

The other approach to the trade balance theories is the "absorption approach" that is indicated by Alexander (1952). Alexander (1952) defines trade balance as "the difference between what the economy generates (total income) and what it takes for domestic use or absorbs (total expenditure)." Hence, this approach is based on how domestic expenditure on domestic goods evolves correspond to domestic output when examining the impacts of exchange rate movements on the balance of trade. Devaluation causes an increase in demand for domestic goods. This rise in export generates a rise in national income. On the other hand, there are "income-induced impacts" in absorption: the increase in the total national income generates extra demand for foreign goods and leads to an induced rise in expenditures. The final impact on the

balance of trade will be based on the relative magnitudes of these initial and induced impacts. The absorption approach can be considered more extensive because it includes not only the substitution but also income impacts of changes in exchange rate (Kutlu, 2013).

In addition, adjustment lag of export and import volumes can be attributed for deficiency of short-term elasticity. When the connection between the real changes in the local currency and the balance of foreign trade is examined, it has become a widespread view that respond of the balance of foreign trade to real fluctuations in domestic currency varies according to the short-run and long-run. Elasticity values are time dependent and generally elasticities of exports and imports with respect to the exchange rate become relatively low and/or inelastic in the short-run. Hence, devaluation/depreciation cannot ameliorate balance of foreign trade in the short-run and so, Marshall-Lerner condition cannot be hold. This situation is interpreted under the J-curve phenomenon. This phenomenon claims that a real exchange rate devaluation/depreciation is predicted to cause an impairment in balance of trade in the short-run and a recovery in the trade balance after a while. This case is considered as J-curve hypothesis that is originated by Magee (1973), because the time line of the behavior of balance of trade resembles to the letter of J.

Magee (1973) realizes that the balance of trade in the US worsens in spite of devaluation of the dollar. Hence, Magee theoretically investigates whether the trade balance can worsen tracing currency devaluation because of lags in the response of trade balance to a change in exchange rate or not. According to Magee (1973), if imports in the country are contracted in terms of foreign currency and exports contracts are made in terms of domestic currency, the value of pre-contracted imports will become more expensive in terms of local currency following devaluation, exports value will be unchanged because exports are invoiced in local currency. Because of the rigidities of the pre-contracted prices, the balance of trade preliminarily worsens after devaluation. When new contracts are made at new exchange rate, volume of exports and imports begin to adjust and volume of imports diminishes and volume of export increases. Therefore, this recovers the balance of trade. The deterioration of trade

balance in beginning is seen because of the price effect, and then it is traced by the recovery outweighed by the volume effect. So, this creates a time pattern that resembles a J letter. Magee (1973) emphasizes three periods: a) the “currency contracts period” signed before devaluation, b) the ”pass-through period” in which the behavior of international prices on contracts that are invoiced after devaluation are modified but the quantities are not influenced yet, and c) the “quantity adjustment period” in which quantities arrange slowly. In the “currency contracts period”, the devaluation of the local currency worsens balance of trade initially if the imports are signed in terms of foreign currency and the exports are denominated in terms of local currency. Moreover, in the “pass-through period”, the international prices after devaluation contracts starts to exhibit the effect of the devaluation. In order to achieve the successful pass-through, contracts made after devaluation creates an increase in the local currency price index of imports in the country whose currency is devalued, and to diminish in the country whose currency is overvalued. In this period, quantities of exports and import do not adjust quickly, and it takes time for “quantity adjustment period”. This implies that a worsening in the balance of trade in the very short-run would indicate a positive outcome in the end. Also, an effective pass-through means a deterioration of balance of the trade. The constancy of quantities is based on two situations, either perfectly inelastic supply as the exporters cannot adjust their sales abroad or to the perfectly inelastic demand as the importers have need for some time to substitute their order of goods and change the flow of orders. However, the case in which both export and import supplies are inelastic in the short-run, would improve trade balance through the pass-through period. According to Magee (1973), when both domestic demand for import and export are perfectly inelastic, this leads to a full pass through in both sides and makes a suitable condition for the quantity adjustment period. Path of arrangement in the quantity adjustment period is based on what happens in the pass-through period. As both demand elasticities of import and export incline to be inelastic in the short run, after a devaluation trade balance may worsen initially. In this situation, price effects dominate volume effects. When ordered quantities start to adjust, volume effects begin to outweigh price effects and then trade balance improves. Therefore, it creates longer time period for devaluation to lead ameliorate in the trade balance. Hence, time pattern

of trade balance traces the letter of J. However, demand elasticities improve in the long-run, so the Marshall-Lerner condition is valid, and the balance of trade recovers.

According to J-curve hypothesis, contract inflexibilities and hysteresis cause that Marshall-Lerner condition does not applied in the short-term (Demirden and Pastine, 1995). Consumers cannot adapt to price changes as they take a certain time to give up their habits and producers cannot also increase their production quantities immediately because they do not know the effects of the new conditions on their profits. In other words, consumers and producers need some time to accommodate to new conditions. The currency contract impact emerges if orders of import and export indicate decisions taken at the old exchange rate prior the devaluation/depreciation. When new contracts are made at the new exchange rate and prices, volume effect becomes dominate and volume of imports diminishes, volume of exports increases to recover the balance of trade, hence the impact of the devaluation/depreciation becomes favorable (Wilson, 2001). Therefore, the J-curve hypothesis suggests that price impact outweighs in the short-run whereas volume impact outweighs in the long-run (Gupta-Kapoor and Ramakrishnan, 1999).

The respond of trade balance to a change in exchange rate in long-run is mostly studied regarding Marshall-Lerner condition approach until J-curve hypothesis is put forward by Magee (1973). Then, the literature has focused on the short-run impact of the exchange rate developments on the balance of trade and analyzed J-curve hypothesis starting from mid-1970s. The results of most empirical studies in the 1980s and 1990s revealed a direct connection among the balance of trade and the exchange rate (Bahmani-Oskooee and Goswami, 2003). Some of these studies accepted the validity of the J-curve hypothesis, as well as many of these studies reject it. In addition, the empirical evidence on this subject is also very complicated. Studies which analyze the existence of the J-curve hypothesis after devaluation/depreciation show that the influence of devaluation/depreciation on the foreign trade balance indicates various results depending on the countries, countries' trade patterns and the exchange rate regime they adopt. Accordingly, the effect of J-curve after devaluation/depreciation may

be different for each country. The next subchapter gives a brief literature review on J-curve hypothesis.

1.2. THE LITERATURE REVIEW: J-CURVE

There is not a consensus about studies in which the validity of the J-curve for Turkish economy is investigated. The reason of this situation can be due to various methods, data structures and time periods which are employed in models.

Most of the studies analyzing the J-curve hypothesis are included in one of the two categories where aggregate trade data are used or where bilateral trade data are employed (Bahmani-Oskooee and Ratha, 2004a). In this study, the studies included in these categories are examined together.

1.2.1. Studies Analyzing the Existence of J-Curve Phenomenon for Countries other than Turkey

Junz and Rhomberg (1973) like Magee (1973) emphasize delayed trade impacts generated by the changes in the relative prices. Hence, they assess that the timing of these effects take time because of some lags in the adjustment. They identify five types of lags. They describe the “recognition lag” as it leads to longer time period for traders to understand the altered competitive situation due to barriers to diffusion of information. Secondly, there is the “decision lag” as new business connections and new orders need time to be modified. Thirdly, there is a “delivery lag” as payments of the import are mostly paid when the imported goods are delivered. Fourthly, the “replacement lag” may be seen since the inventories and equipment should be used up in advance of new materials are taken. Lastly, there is the “production lag” as the manufacturers require some time to become aware of that the new case is sufficiently beneficial to generate again. Due to these lags, they claim that the lag of the trade impacts after changes in relative price should be evaluated accurately in terms of years rather than quarters. In their analysis, annual data covering the period of 1953-1969 for 13 countries (the Netherlands, Canada, the UK, Austria, Sweden, Belgium-Luxemburg,

the US, Germany, Japan, Norway France, Italy and Denmark) is employed. They estimate both average price-elasticities of market shares in manufactured exports and the average price-elasticities of manufactured exports. As a result, the responsiveness of trade flows to changes in relative price obviously seems to prolong around four to five years. In addition, they claim that 50% of the full impacts is seen throughout the first three years as 90% of effects occurs throughout the first five years. According to them, the responsiveness of the trade flows to fluctuations in exchange rate resembles to the responsiveness to movements in prices denominated in domestic currency.

Miles (1979) criticizes the studies of Cooper (1971), Connolly and Taylor (1972), Laffer (1976), and Salant (1976) in which the impacts of devaluation of local currency on the balance of foreign trade and on the balance of payments are examined but none of them has taken into consideration variables other than exchange rate that may change those balances. According to Miles (1979), these studies have three drawbacks: a) these studies fail to indicate whether a recovery in the balance of trade is temporary or permanent, b) these studies do not compare post-devaluation and pre-devaluation levels of the accounts, c) these studies do not take into consideration the impacts of alternative factor e.g. the monetary or fiscal policy. To overcome these objections, Miles (1979) includes both the impacts and the impacts of devaluation in the long-run to compare with the pre-devaluation behavior of the accounts in the analysis. Also, in addition to exchange rates, Miles (1979) uses exogenous variables which concerns government monetary and fiscal policies and growth rates.

According to Miles (1979), if devaluation creates an important recovery in the balance of trade, this has to be statistically visible regardless of which theoretical background is employed. So, Miles (1979) tries to test whether devaluation recovers the trade balance and/or balance of payments for 14 developed and developing countries (Israel, Costa Rica, the UK, Denmark, New Zealand, Ireland, Finland, the Philippines, France, Iceland, Ecuador, Sri Lanka, Spain, Guyana) using several tests for the annual data during the period of 1956-1972. Miles (1979) denotes that devaluation does not ameliorate the foreign trade balance , however recovers the balance of payments. This

empirical evidence refers that recovery of the balance of payments stems from the capital account.

On the other hand, Himarios (1985), unlike Miles (1979), using similar methodology, demonstrates that devaluations influence the trade balance expected direction. Also, Himarios (1985) criticizes the result of Miles' study providing that: a) the outcomes are sensitive to units of measurement, b) factors of domestic and foreign can have various effects on balance of trade, c) real exchange rate is the one impacting the balance of trade rather than the nominal exchange rate, d) the lags of exchange rates have a role, e) analyzing the impacts on the balance of trade on the average is not the identical as analyzing the impacts on the average balance of trade (Bahmani-Oskooee and Ratha, 2004a). Himarios (1985) uses an absorption approach model for ten countries (Ecuador, Sri Lanka, Costa Rica, the Philippines, Finland, the UK, France, Israel, Spain, Iceland). It is concluded in the analysis that real devaluations recover the trade balance.

Bahmani-Oskooee (1985) tries to determine validity of J-curve for developing economies: Thailand, Korea, India, and Greece that have various exchange rate policies for the 1973-1980 period applying quarterly data. He forms the balance of trade model employing real exchange rate, world and domestic income, domestic and world monetary variables as explanatory variables. He finds that the duration of the impairment and recovery of the balance of trade varies among countries. The analysis result indicates that for India, Korea and Greece, there is an evidence of J-curve hypothesis whereas balances of trade in these countries also worsen in the long-run tracing a devaluation as well. However, balance of trade in Thailand recovers for 5 quarters subsequent to devaluation and then it begins to worsen whereas trade balance in Thailand improves following a devaluation in the long-run.

Arndt and Dorrance (1987) use a motto to define J-curve phenomenon. This motto relates to that "things may get worse before they get better." They also examine J-curve phenomenon in terms of small and large country case separately. In small country, traders are price taker in international trade and nothing can impact the foreign currency prices of imports and exports. When domestic currency devalues, it does not affect

terms of trade. Hence, J-curve effects do not emerge in the small country. They attribute that J-curve phenomenon relates to large country case.

However, for the small country like Turkey which signs exports and import contracts in terms of foreign currency, a J-curve phenomenon may be seen when the trade balance is running deficit and demand and supply elasticities are too weak in the short-run (Wilson and Tat, 2001). In this situation, depreciation of the domestic currency rises worth of both exports and imports with regard to local currency, as imports exceed exports initially the balance of trade would deteriorate in the short-run. Investigating J-curve phenomenon for Turkey can be possible because Turkey has given persistent trade deficit each year since 1947.

The existence of the trade deficit in the US despite of devaluation is studied by Krugman and Baldwin (1987). Krugman and Baldwin (1987) analyze three most drastic explanations about why trade deficit does not become lower despite of the depreciation of the US dollar. Firstly, the dollar does not actually drop against a wide currencies' basket. Secondly, resolution of foreign trade balance is based on economic growth of foreign country rather than the dollar. Lastly, balance of trade indicates gaps among income and expenditure in which exchange rates are not relevant. They find that trade deficit in the US does not fall mostly because of higher US demand growth and the lagged impacts of the strong US dollar.

Felmingham (1988) wants to explain J-curve argument for Australia. A ratio of imports over exports for trade balance, a ratio of exports over imports prices for terms of trade, domestic and foreign incomes are employed during the period of 1965Q1–1985Q2. Also, Felmingham studies three sub-periods where the same exchange regime is employed: fixed exchange rate era (1965Q1 and 1974Q3), managed floating era (1974Q4 and 1983Q4), and a broaden period containing the free floating regime from 1974Q4 to 1985Q2. Felmingham finds that J-curve is not valid for the period of managed and free-floating exchange regimes. However, a few supports of J-curve for the fixed exchange rate period prior to 1974 are found whereas the coefficients are inconclusive and it proceeds more than two years to for the improvement of balance of

trade to pursuing a terms of trade correction. This may be considered as a demonstration of a delayed J-curve for this period. In addition, it is stated that no recovery in trade balance after depreciation has been found since 1974 because the demand elasticities of import and export in Australia have been subdued.

Bahmani-Oskooee (1989) makes an amendment to his earlier studies written in 1985 and redescribe real exchange rate as the unit of local currency per unit of foreign currency. Therefore, increase in exchange rate leads to depreciation in local currency. After depreciation, the lag coefficients of exchange rate are anticipated to become negative pursued by positive ones to ensure J-curve. Bahmani-Oskooee (1989) recomputes the same model for the same time period. Bahmani-Oskooee (1989) finds that the balance of trade for all four countries (Greece, India, Korea and Thailand) recover initially and then worsen after devaluation. This time path movement of balance of balance is called “inverse J curve.” This empirical evidence become contrast to the results reported in the previous article. However, long-run impacts of devaluation are consistent with earlier results. Moreover, devaluation recovers the trade balance for only Thailand case.

Himarios (1989) works the effectiveness of devaluation in adjustment of balance of trade by investigating into two ways for 27 countries. The first way examines that a nominal devaluation can achieve to influence the real exchange rate. The second way analyzes that trade flows responsiveness is well enough to real exchange rate movements hence volume effects are included. Himarios (1989) tries to find the relation among real and nominal exchange by adopting trade data for two sample periods: 1953-1973 and 1975-1984 containing different sets of countries. Then, Himarios (1989) comes up with a close relation among nominal and real exchange rates and realizes that the devaluations change the real exchange rate over policy relevance 2 to 3 years in both 1953-1973 period and 1975-1984 period. For the 1953-1973 period, when the cumulative impacts are questioned, the real exchange rate is determined to affect trade balance considerably. However, J-curve is found only for the UK case. Himarios also concludes that there are no important gaps among the nominal and real exchange rate for the 1975-1984 period. In addition, he computes the balance of trade model adopting

nominal exchange rates for a various group of countries. In 1975-1984 period, devaluation is determined to influence balance of trade considerably cases like the first period while J-curve is valid in Ecuador, France, Greece and Zambia.

Noland (1989) who investigates validity of J-curve, criticizes previous studies because he claims that earlier workings have mischaracterized the arrangement of volumes of trade to fluctuations in relative price by allowing the coefficients of the price and income terms to have the identical lag pattern. Therefore, this creates low or statistically insignificance elasticities. To overcome this obstacle, Noland (1989) uses gamma distributed lag model for the period of 1970Q1-1985Q4 in Japan. Noland (1989) predicts demand of export and import and export supply. According to result of analysis, activity variables tend to have short lags (average lag is less than one year) whereas the relative price variables relates to extended lag structure. Also, he finds that Japanese trade balance indicates J-curve phenomenon initially worsening, then improving in the response to devaluation getting balance in between seven to eight quarters. Moreover, he concludes that, on the other hand, if decision makers want to aim the trade balance, policies that which influence economic performance would be more useful than those that work for the exchange rate.

The validity of J-curve for American aggregate trade and bilateral trade with Germany, France, Japan, the UK, Italy and Canada is investigated by Rose and Yellen (1989) employing quarterly data during the period of 1960-1985. They define balance of trade as a function of foreign and domestic real income and real exchange rate. They find that J-curve does not hold for American bilateral trade balance. However, they realize that there is a low support of J-curve in aggregate level because of calculation technique. They result that there is a low evidence of presence of a J-curve or indeed of a reliable relationship among balance of trade and real exchange rate.

Rose (1991) studies relation among the real effective exchange rate and the real balance of trade for 5 countries which are the members of the Organisation for Economic Co-operation and Development countries (OECD): German, the US, Japan, the UK, and Canada adopting monthly data during 1974-1986. Empirical result denotes that there is

not any powerful relation among trade flows and exchange rate. As a result, the generalized Marshall-Lerner condition does not work for these countries.

Demirden and Pastine (1995) realize that exact empirical prediction of the J-curve is crucial. According to them, the Ordinary Least Squares (OLS) technique is proper for testing the J-curve hypothesis in a fixed exchange rate regime. However, they realize that the OLS regression does not catch these feedback impacts. Therefore, they suggest Sims' (1980) vector autoregression (VAR) analysis because it saliently endogenizes all variables. They adopt the US data series covering period for 1978-1993 which includes the flexible exchange rate period to show the significance of using a method which contains the feedback impacts. They found that outcomes of OLS regression show that J-curve hypothesis does not emerge. However, VAR technique indicates a J-curve hypothesis via impulse response analysis. It is claimed that feedback impacts can be significant and can alter the outcomes of analysis.

Marwah and Klein (1996) predict and examine the form of the time lags in trade arrangements in responding to changes in relative prices for both the US and Canada with other Group of Seven countries (the UK, Japan, Germany and France except for Italy) that are major trading partner of Canada and the US. They employ quarterly data for the period of 1977Q1-1992Q1. They find that the J-curve for the US becomes positive during the third quarter after depreciation, J-curve for Canada reaches positive values after only one quarter to recover the trade balance.

Zhang (1996) questions the connection among the exchange value of the Chinese Renminbi and balance of trade in China during periods between 1991 and 1996 with monthly data. Cointegration approach and Granger methods are applied. A stable linear relation among the real exchange rate, the real trade balance and its quantity components is found in the long-run. According to findings, the trade balance Granger causes the exchange rate. Nevertheless, exchange rate does not Granger cause the balance of trade. Hence, J-curve phenomenon does not appear. Moreover, the casual relation among prices and volumes of export/import are investigated as exchange rate influences volumes via price. Notwithstanding, no causal connection from the prices to

the volumes of imports and exports is found but contrary relations exist. In addition, a strong two-sided causal relation between the real exchange rate and the price components of the balance of trade is obtained. Also, empirical result seems to be confirming that the devaluation of the Chinese Renminbi is inflationary and it may not recover exports.

The works of Rose and Yellen (1989) and Marwah and Klein (1996) are criticized by Bahmani-Oskooee and Brooks (1999) because of shortcomings of their studies. Bahmani-Oskooee and Brooks (1999) criticize the study of Rose and Yellen (1989) a) for their results that are sensitive to units of measurement, b) for employing a cointegration method which has a weak power unit root test, c) for not adopting objective criterion for lag-length selection. In addition, they criticize Marwah and Klein (1996) because they use nonstationary data. Bahmani-Oskooee and Brooks (1999) examine that validity of J-curve phenomenon and reaction of the balance of trade to a currency depreciation both in the short-run and long-run for the US bilateral trade with her six main trading partners (the UK, Germany, Canada, France, Japan, and Italy). They employ ARDL approach over the period of 1973Q1-1996Q2. Bahmani-Oskooee and Brooks (1999) use a model which is like Rose and Yellen (1989)'s model, however they use the balance of trade model as the ratio of imports to exports, this norm is a unit free measurement and indicates balance of trade in both real and nominal terms. Empirical evidence denotes that J-curve phenomenon does not appear in the short-run, however, a real depreciation of the dollar has a favorable long-run influence on the balance of trade in the US.

The J-curve hypothesis is investigated for Japan by Gupta-Kapoor and Ramakrishnan (1999). They adopt the ECM and the impulse function analysis adopting quarterly data over the period of 1975-1996. They conclude that as a result of impulse response function J-curve hypothesis holds for Japan.

Wilson and Tat (2001) analyze the validity of the J-curve for Singapore. For this purpose, they study the relation among the real trade balance and the real exchange rate for bilateral trade in commodity goods among Singapore and the US during the period

of 1970-1996 adopting quarterly data. They find that real exchange rate does not affect considerably the real bilateral balance of trade among Singapore and the US. Also, they reveal low support of a J-curve.

Wilson (2001) analyzes the connection among the real trade balance and the real exchange rate and existence of the J-curve hypothesis for bilateral trade among Singapore, the US, Japan, Korea and Malaysia. On the other hand, the US and Japan are chosen the trading partners for each country. This situation is criticized to be a very narrow work by definition (Bahmani-Oskooee and Ratha, 2004a). ARDL approach is adopted employing quarterly data during the period from 1970 to 1996. According to results, real exchange rate does not affect significantly real trade balance except for Korea. In addition, no support for validity of J-curve for Singapore and Malaysia is found. However, for Korea some J-curve impacts with respect to both Japan and the US are found.

Lal and Lowinger (2002) question the relation among the balances of trade and real effective exchange rates of 7 East Asian countries: the Philippines, Japan, Korea, Thailand, Malaysia, Indonesia and Singapore in the short-run and long-run. Lal and Lowinger (2002) implement cointegration technique, ECM and impulse response function applying quarterly data for period from 1980-1998. They find that there is a cointegration relation among variables in the long-run. Also, ECM is predicted to find short-run relations. The impulse response function of countries, except for Japan, accept the presence of the J-curve. Empirical findings demonstrate that the length and the duration of the J-curve vary among countries because countries have various exchange rate and trade regimes.

Arora et al. (2003) study the reaction of the foreign trade balance to a currency depreciation both in the short-run and long-run employing ARDL approach on quarterly data for 1977-1998. Indian bilateral data against her 7 main trading partners (France, Italy, the US, Australia, the UK, Japan, and Germany) is used. As a result, J-curve hypothesis does not work for main trading partners of India, however the depreciation

of local currency recovers foreign trade balance in India in the cases of Italy, Australia, Japan and Germany in the long-run.

Onafowora (2003) analyzes that J-curve effect holds for three ASEAN countries: Indonesia, Thailand and Malaysia whose exchange rate has depreciated since mid-1990s. In this context, he studies the relations among the real balance of trade and real exchange rate for these countries in their bilateral trade to Japan and the US. Cointegration analysis and a vector error correction model (VECM) are adopted to examine the short-run dynamics and long-run impacts over the quarterly period 1980-2001. Also, generalized impulse response analysis is implemented. The result indicates that there exists a long-run steady-state cointegrating relation among variables. In addition, he found that J-curve is valid in the short-run for the relationship of real exchange rate and real trade balance between Indonesia-the US, Indonesia-Japan, Malaysia-the US, Malaysia-Japan and Thailand-the US. In the meantime, within relation between Japan and Thailand, the positive short-run impact of a real depreciation recovers at first then worsens and then recovers again the trade balance. This means that the result does not support J-curve hypothesis in the short-run. He concludes that this situation can be expressed by the S-curve hypothesis rather than the J-curve. All in all, according to results, in the long-run that Marshall-Lerner condition is satisfied for these there ASEAN countries which have different degree of J-curve impacts in the short run.

The validity of J-curve phenomenon for Japan and her 9 main trading partners (the Netherlands, Germany, Switzerland, Australia, the US, France, Canada, the UK and Italy) is analyzed by Bahmani-Oskooee and Goswami (2003) adopting ARDL approach and applying quarterly bilateral data during the 1973-1998 period. As a result of findings, J-curve works for the bilateral trade between Japan-Germany and between Japan-Italy. Moreover, impact of real depreciation of the yen is found positive for Canada, the US and the UK in the long-run.

Bahmani-Oskooee and Ratha (2004b) enhance the study of Bahmani-Oskooee and Brooks (1999) with including 18 industrial trading partners of the US (France, Spain, the Netherlands, Australia, New Zealand, Austria, Canada, Switzerland, Denmark,

Finland, Norway, Germany, the UK, Italy, Japan, Belgium, Sweden, Ireland). They use ARDL approach for their model. When they adopt “new definition of the J-curve” which restate J-curve as the short-run deterioration impacts of the devaluation on the balance of trade combining with long-run favorable impact, they find important evidence for J-curve in 10 countries of 18 countries (France, Sweden, Japan, Denmark, Austria, Ireland, Italy, Germany, Switzerland, New Zealand). According to them, “the short-run dynamics do not support the textbook version of J-curve.” However, real depreciation of the dollar recovers trade balance in the long-run for the most countries.

Narayan (2004) searches the J-curve adjustment behavior after devaluation in the New Zealand dollar for the period of 1970–2000. In this context, cointegration relation among trade balance, domestic income, foreign income and real effective exchange rate is investigated. As a result, cointegration relation among factors in the long-run is not found. A causal link in both directions among balance of trade and foreign income is found. Also, the impulse response analysis is employed to identify that responsiveness of balance of trade to the changes in real effective exchange rate traces a J-curve pattern. The outcome reveals that a depreciation deteriorates balance of trade for the first 3 years and then recovers it. This shows that the result supports J-curve.

Narayana and Narayan (2004) try to find determinants of trade of balance and test that J-curve phenomenon for Fiji. The data series which is adopted is annual during the period 1970 to 2002. According to empirical evidence, long-run relation among determinants of trade balance (real domestic income, real foreign incomes and real effective exchange rate) is found. In addition, three results are revealed. Firstly, domestic income influences negatively the trade balance. Secondly, foreign income influences positively the trade balance even though the response is not elastic. Thirdly, the impulse response function shows that worsening in balance of trade in Fiji stemming from a positive shock in exchange rate for the first two years; then, the balance of trade begins recovering. Therefore, there is an evidence of J-curve for Fiji.

The J-curve phenomenon between the UK and the US for 177 industries in the UK is studied by Bahmani-Oskooee and Kovyryalova (2008). They apply Bounds Test for the

period of 1962-2003. According to results, although trade balances of 107 industries out of 177 are influenced by a real depreciation in the British pound in the short-term, new definition of J-curve works for 66 industries.

1.2.2. Studies Analyzing the Existence of J-Curve Phenomenon for Turkey

Rose (1990) computes the impact of the real exchange rate on the balance of trade of 30 developing economies including Turkey. Rose (1990) uses two data series; annual data of the period 1970-1988 for 30 countries and quarterly data of the period 1977-1987 for 19 countries. Rose (1990) also employs a nonstructural trade model that balance of trade is defined as a function of the real exchange rate, and both domestic and foreign expenditure. Rose (1990) wants to examine that how the real exchange rate movements influence the balance of trade both in the short-run and the long-run and the cumulative impact of the exchange rate is favorable on the balance of trade. According to results, even though the influence of real exchange developments on trade balance in Turkey is detected to be ignored; the cumulative impact denotes that depreciation leads to recovery in the balance trade in case of Turkey.

Bahmani-Oskooee and Alse (1994) criticize the utilization of macroeconomic factors which have unit roots by comparing the study of Miles (1979) in which first differenced variable, stationary data are adopted against the study of Himarios (1989) where the level of variable, non-stationary data are applied. According to them, using non-stationary data affects standard critical values used in identifying the significance of computed coefficients and makes them invalid. Hence, the results of studies using nonstationary data e.g. Himarios (1989), Bahmani-Oskooee (1985) are offered to be neglected.

The relation among the balance of trade and the exchange rate both in the long-run and the short-run is analyzed again by Bahmani-Oskooee and Alse (1994) for 19 developed and 22 less developed countries including Turkey. The quarterly data for the period of 1971Q1-1990QIV is used applying the Engle and Granger technique and ECM. They describe balance of trade as a ratio of imports to exports. It is found that a relation in the

long-run among the trade balance and the effective exchange rate for the Netherlands, Brazil, Costa Rica, Singapore, Turkey and Ireland. This indicates that devaluations lead to a long-run positive influence on the balance of trade of these five except for Ireland that have negative effect. According to ECM, except for Brazil and Singapore, in the remaining cases of 6 countries including Turkey the trade balance deteriorates before getting better, these findings support the J-curve for these countries.

Miles (1979) and Himarios (1989) are criticized by Bahmani-Oskooee and Malixi (1992) because Miles (1979) and Himarios (1989) in their studies use bilateral exchange rates. Bahmani-Oskooee and Malixi (1992) applies real effective exchange rates examining the response of the trade balances of 13 less developing economies (Brazil, Thailand, Mexico, India, the Philippines, Korea, Pakistan, Turkey, Peru, Greece, Egypt, Portugal and the Dominican Republic,) to a change in real effective exchange rates. Almon lag structure is used adopting quarterly data for the period of 1973Q1-1985Q4. They use the balance of trade which is described as the ratio of exports to imports, the real effective exchange rate, real domestic and world outputs real domestic and world money supply in their model. As mentioned in Magee (1973)'s article, the pattern of the balance of trade can indicate different shapes of the letters such as of trade J, N, inverse N, I, M. As a result of analysis, it is found that J-curve phenomenon works for Brazil, Greece, India and Pakistan; N curve is observed for the Philippines, Egypt, Mexico and Korea.; the M curve is met for Thailand; the I curve is seen for Peru and Portugal; the inverse of the N curve is valid Turkey and the Dominican Republic. The inverse of the N curve detects that the balance of trade worsens at the beginning after a real depreciation and after that recovers for a while, however starts to worse again. In addition, they conclude that that depreciation has favorable impacts on the trade balances in Turkey, Pakistan, the Philippines, Egypt, Thailand, Peru, Brazil, and Portugal in the long-run.

As Akbostancı (2004) mentions, some studies applied a sample period in which Turkish economy experienced remarkable structural changes. As she points out, Turkey had fixed exchange regime which was seldomly devalued and the exchange market had tight regulation until the 1980s. Brada et al. (1997) consider these facts in their analysis and

separate their sample (1969-1993) into two periods, pre- and post-1980 (1969-1979 and 1980-1993). For pre-1980 period, as they anticipate no cointegration relation among the balance of trade and the real exchange rate is found. They believe that the absence of cointegration relation for the pre-1980 period is found because trade controls implemented by Turkey likely restricted the ability of fluctuations in the exchange rate to impact imports and exports volume in Turkey. For the post-1980 period, they find a relation among domestic and foreign income, balance of trade and the real exchange rate in the long-run. They attribute liberalization regime as the reason of this situation. They use the ECM via polynomial distributed lags to examine short-run dynamics for the post-1980 period. This analysis result indicates that balance of trade responds to the movements in real exchange rate but not exactly following J-curve path. It may be concluded that change in the trade policy of Turkey in the 1980s had a notably influence on trade balance in Turkey.

Kale (2001) examines how balance of trade in Turkey responds to real depreciation of exchange rate. She employs cointegration analysis to compute the elasticities in long-term and ECM to compute dynamics in the short-term adopting quarterly data covering the period of 1984Q1-199Q2. She finds that trade balance in Turkey recovers in response to real exchange rate changes. Also, empirical results demonstrate that trade balance of Turkey is affected negatively by rise in domestic income in the long-run. This situation is attributed that the expansionary impacts of economic growth on imports are higher than the favorable impact on the exportable surplus due to trade liberalization. In addition, she finds an evidence which shows that increase in foreign income causes improvement in balance of trade, which points out the degree of market integration. According to short-run analysis, a real depreciation deteriorates the trade balance three quarters later. However, an initial recovery in trade of balance is seen as a response of real depreciation. She interprets this by emphasizing that intermediate goods imported from abroad becomes more expensive, this affects adversely imports, hence imports initially decrease. As trade balance worsens after the third quarter of the depreciation, this result can be concluded as a delayed J-curve impact.

Akbostancı (2004) tests the validity of a J-curve for Turkey applying quarterly data during the period of 1987-2000. The ECM is applied to predict the long-run and short-run relation. It is resulted that real exchange rate is the essential factor that influences the trade balance in the long-run. This means that a real depreciation of TL ameliorates balance of trade. The balance of trade equation indicates that the real exchange rate and the domestic income are the essential factors of the trade balance in the short-run. Also, the relation among real exchange rate and balance of trade has a feedback. A recovery in the balance of trade can cause a real appreciation of the TL in the short-run. Generalized impulse responses are implemented to investigate whether J-curve is valid for Turkey or not. She finds that a positive shock in the real exchange rate primarily recovers the balance of trade, then makes it worse and in the end improves it. This result means that J-curve does not work in the short-run and a short-run attitude of the balance of trade in response to real exchange rate shocks indicates an S-pattern.

Halıcıoğlu (2007) works the J-curve effects of the bilateral trade between Turkey and her nine trading partners (Italy, the US, Germany, Austria, France, Switzerland, the UK, Belgium and Holland), as well as aggregate trade balance data employing VECM. According to empirical findings, there is not any evidence for the validity of the J-curve in the Turkey via aggregate and disaggregate data. Nevertheless, Marshall-Lerner condition is met for Switzerland, Germany, the US, Italy, and Holland via aggregate data. In addition, it is stated that depreciation of TL might recover the balance of trade, however these improvements would take notably long time, because the exchange rate elasticities in the long-run real are too weak. Furthermore, some of the Turkish bilateral trade balances equations are decided to be unstable in the long-run. Hence, it is suggested that the devaluation policy should not to be implemented to struggle the trade deficits in Belgium, Italy and the UK.

Halıcıoğlu (2008a) works on the relations among real exchange rate, domestic income, foreign income and balance of trade in Turkish economy. Bounds Test approach and ARDL are applied to analyze the validity of J-curve hypothesis for Turkey in the long-run and short-run adopting quarterly data covering the 1980-2005 period. Analysis

results confirm that J-curve hypothesis is valid only in the short-run. However, outcome of Granger causality is confusing.

The presence of the J-curve hypothesis of Turkey with her 13 trading partners (Germany, France, Holland, Austria, Belgium, Canada, Denmark, Italy, the UK, Japan, Switzerland, Sweden and the US) is investigated by Halıcıoğlu (2008b). Bounds Test is adopted to analyze the short-run relations and long-run effects of the depreciation of TL on the balance of trade among Turkey and her 13 trading partners adopting quarterly data during the 1985–2005 period. As a result, J-curve impact is not obtained in the short-run, however the real depreciation of the TL has favorable influence on balance of trade in Turkey with the US and the UK in the long-run.

Peker (2008) studies the connection among balance of trade and real effective exchange rate of Turkey both in the long-run and short-run for quarterly data covering the period of 1992-2006. Cointegration method is used to investigate Marshall-Lerner condition in the long-run and ECM is applied to test J-curve in the short-run. The empirical evidence denotes that balance of trade in Turkey does not improve in response to devaluation of TL. This means that in the long-run Marshall-Lerner condition is not met for Turkey. Also, in the short-run J-curve impact is found insignificance.

The J-curve phenomenon for 11 East European emerging countries is tested by Bahmani-Oskooee and Kutan (2009). Most of them are the new EU members or the EU candidate countries (Croatia, the Czech Republic, Bulgaria, Romania, Slovakia, Russia, Cyprus, Hungary, Poland, Ukraine and Turkey). Bahmani-Oskooee and Kutan (2009) use Bounds Test approach for monthly data during the period of 1990M1-2005M6. They mention that countries in the analysis are relatively small open economies which mostly depend on export incomes to enhance the growth of economy. Hence, Bahmani-Oskooee and Kutan (2009) assess that the connection among trade flows and exchange rates is a very crucial because the volatilities in the export incomes due to damaging exchange rate changes may lead to a drawback to convergence toward the EU standards. Also, they pay attention that competitiveness is also extremely impacted by exchange rate movements in developing countries. As a result of analysis, it is found that the J-

curve is met only for Hungary. Moreover, when new description of the J-curve phenomenon is described as adverse short-run deterioration impacts merged with long-run recovery impacts, they find that new description of J-curve impacts is observed for Bulgaria, Croatia and Russia. In other words, for 3 of the 11 countries the short-run impacts last into the long run. Moreover, Turkey has short-run impacts of depreciation of domestic currency. However, a relation among the exchange rate changes and the trade balance of Turkey is not found in the long-run. In addition, the short-run and the long-run coefficients estimated are unstable. This situation may emerge due to a series of financial crises that emerged in Turkey along the working period. Therefore, they offer that the policy makers may not implement the exchange rate policy to ameliorate the balance of trade and growth of economy particularly in the long-run in the countries where real depreciation has short-run impacts, the short-run impacts do not proceed into the long-run like Turkey. In this situation, monetary and fiscal policies can be argued to be adopted to convergence toward the standards of EU.

The J-curve impacts and the Marshall-Lerner condition are investigated by Vergil and Erdoğan (2009). They use ARDL to find cointegration among variable and question Marshall-Lerner condition and employ Almon methodology to test J-curve impact for 1989-2005 period using quarterly data in Turkey. Empirical results confirm that Marshall-Lerner condition is not valid. Moreover, they find that devaluation adversely affects the trade balance in the short-run, however after four quarters, the balance of trade is positively impacted. It can be concluded that J-curve hypothesis works for Turkey.

The existence of Marshall-Lerner condition for Turkey is tested by Yavuz et al. (2010). The Bounds Test approach based on ARDL model is employed to find long-term cointegration relations among variables (trade balance, domestic and foreign income and real exchange rate) adopting quarterly data for the period of 1988-2007. The analysis results that Marshall-Lerner condition is not met in the long-run but J-curve phenomenon is valid for Turkey in the short-run.

The validity of J-curve for the bilateral trade among Turkey and her seven trading partners (Germany, Japan, France, the US, Italy, the UK, and the Netherlands) is analyzed by Çelik and Kaya (2010) employing panel cointegration techniques for the period of 1985Q1 -2006Q4. Trade balance equation is formulated as a function of real incomes and real exchange rates. According to empirical results, real depreciation of TL ameliorates balance of trade with Japan, the UK, and Germany in the long-term. Impulse response function indicate that J-curve phenomenon does not work for any country case. Nonetheless, they find the reverse J-curve for Germany and the US case and a reverse S-curve impact (after a real devaluation, trade balance recovers initially, then worsens, but then again recovers) for the Netherlands and the UK. Also, it is found that only the balance of trade with France first worsens after a real devaluation.

Ketenci and Uz (2011) work on the relationship among the EU's import and export values and real exchange rate. They employ ARDL model adopting quarterly data for the 1980–2007 period and compute bilateral export demand equation and bilateral import demand equation among the EU and its major trading partners, which are eight countries: Norway, China, Russia Japan, Canada, the US, Turkey and Switzerland and six regions: the new EU members (Romania and Bulgaria and one candidate, Turkey), the Central and Eastern European countries, the European Free Trade Area (EFTA), the North American Free Trade Area (NAFTA), the Association of Southeast Asian Nations (ASEAN), and the Dynamic Asian Countries. They find that there is no cointegration relation in Russia, the Central and Eastern European countries case and the new EU members in the bilateral export demand function and in the cases of the Central and Eastern European countries, the NAFTA and the ASEAN in the bilateral import demand function. Therefore, they exclude these countries from the further estimations. Also, evidence of the J-curve in bilateral export demand function for NAFTA, China, Canada, and Japan and in the bilateral import function in the case of Canada are found according to estimation results. Moreover, empirical evidence denotes that income is seemed to be more important in the long-run. Estimated coefficients are found unstable in the bilateral export demand and stable in the bilateral import demand for Turkey.

Demirtaş (2014) studies the bilateral trade balance between Turkey and Germany. ARDL model is adopted to investigate impacts of depreciation of TL on Turkey's balance of trade with Germany adopting monthly data during the period of 2002M1-2012M8. As a result, it is found that the real depreciation of the TL has a statistically important positive impact on Turkey's trade balance with Germany both in the short-run and long-run. This situation confirms the long-run impacts described in J-curve but is not consistent with short-run impacts. In the model, industrial production indices are employed as proxy for income of two countries. Also, it is found that rise in real income of Turkey adversely effects the bilateral trade balance among the two countries in both the short-run and long-run. In other words, Turkey's real income growth deteriorates the balance of trade with Germany. This situation is interpreted that the rise in real income increases the total demand of individuals and as the marginal propensity to import increase demand for foreign goods, it has an adverse influence on balance of foreign trade. In addition, it is concluded that the rise in real income of Germany has adverse effect on balance of trade in Turkey in the short-run. However, the rise in the real income of Germany has no statistically significance impact on the balance of foreign trade among the two countries in the long-run.

Yazıcı and Islam (2014) analyze the short-run and the long-run relationship between real exchange rate and the bilateral trade balance of Turkey with EU (15) countries (Germany, Holland, Austria, France, the UK, Belgium-Luxembourg, Italy, Spain, Finland, Portugal, Greece, Ireland, Denmark and Sweden) which constitute about 50% share in total trade of Turkey. They adopt Bounds Test approach employing quarterly data for the period of 1982-2001. According to empirical results, no evidence for J-curve in any case is found in the short run. However, they claim that real depreciation of TL recovers the balance trade of Turkey with the UK, Denmark, Austria, Ireland, France, Italy and Sweden in the long-run. In addition, they reveal that the domestic and trading partner's real incomes are more important than the real exchange rate variable in the determination of bilateral balance of trade between Turkey and EU (15) countries.

J-curve impact on balance of foreign trade in Turkey is studied by Karamelikli (2016) using ARDL and NARDL (nonlinear autoregressive distributed lag) models for the

symmetric and asymmetric models. Also, quarterly and monthly data are adopted during the period of 2003-2015. He concludes that no cointegration relations among variables and no J-curve phenomenon are found according to analysis result employed quarterly data. Moreover, symmetric relationship in the short-run and asymmetric relationship and cointegration is found in the long-run according to the outcomes of the analysis employed monthly data. In addition, J-curve effect is found invalid for Turkey both models used monthly and quarterly data.

Yılmaz et al. (2017) analyze whether of J-curve phenomenon is valid for Turkey. They use ARDL-Bounds test approach employing annual data during 1989-2014. As a result of the model, they find that a long-term relation among variables (balance of foreign trade, gross domestic product of Turkey, gross domestic product of the world and real exchange rate) exist. In addition, they conclude that coefficient of real exchange rate is insignificance in long-term but significance and positive in short-term (depreciation of real exchange rate has favorable impact on foreign trade deficit). However, it can be interpreted that there is no support for J-curve phenomenon.

Bal et al. (2017) try to find new empirical evidence on the determinants of Turkey's bilateral trade balance with the European Union (EU) countries focusing on the impacts of the developments in the real exchange rates. They both estimate demand function of export and import for Turkey in relation to the EU adopting ARDL model and Granger causality for the period of 1997M1-2016M12. According to ARDL model result, there is no cointegration relation among variables for export demand model, but a cointegration relation among variables for import demand model in the long-run. In addition, they find that in the long-run, one percentage increase in Turkish income increases imports from the EU by 1.3% and one percentage rise in real exchange rate increases also imports from the EU by 1.5%. In other words, real appreciation of TL causes the increase in imports from the EU in the long-run. Moreover, they find that no J-curve phenomenon is supported in the short-run. Granger causality test results also support the ARDL model findings. According to Granger causality test, causal link between exports to the EU and real effective exchange rate is not found, however there is bidirectional causal link among imports from the EU and real effective exchange rate.

Overall outcomes show that the domestic and foreign incomes, exchange rates, and import contents of export are among the factors determining the Turkey's trade balance with the EU. As, the exchange rate adjustments are not found sufficient enough, and have some negative effects in sometimes, the integrated trade policies consistent with the exchange rate changes are suggested to recover the persistent trade deficits in Turkey.

Influence of developments in the real exchange rate on Turkey-EU trade is investigated by Kösekahyaoğlu and Karataşlı (2018) under the notion of the J-curve for 1994Q1-2016Q4 period. They employ Granger Causality Test, VECM and Johansen Cointegration Test. The findings of these methods indicate that the Turkey-EU trade is influenced by the changes in the exchange rate. Nonetheless, a real decrease in the value of exchange rate is found negative and statistically significance effect of the trade balance both in the short-run and long-run. While these outcomes are compatible with the J-curve in the short-run impact, it is not compatible with the long-run impact. Also, it is concluded that policies depended on only on devaluation and price competition would not be efficient on the Turkey-EU trade and non-price factors that affects the competitiveness of Turkey should be given to more importance.

CHAPTER 2

FOREIGN TRADE POLICIES OF TURKEY FROM 1923 TO PRESENT

In this chapter, after analyzing developments in foreign trade policies of Turkey as of certain periods, the developments in Turkish foreign trade and bilateral trade between Turkey with European Union will be overviewed briefly.

2.1. FOREIGN TRADE POLICIES BEFORE 1980

Turkey implemented various trade policies before 1980. In 1923-1929 period, with the establishment of the Republic of Turkey etatist policies outweighed. In 1930-1949 period, mixed policies were adopted. In 1950-1962 period, instead of decreasing the role of the state in the economy, state intervention increased with the rise in the number of state economic enterprises. Therefore, partial liberalization period was seen in this period. The 1963-1980 period became planned period.

2.1.1. 1923 – 1929 Period

After the declaration of the Republic in 1923, in Turkey a transformation process took place in all areas of society to create a modern country. The economic reflection of this change was a rapid economic organization and legal regulation. As in all areas, there have been a lot of efforts to develop foreign trade for the benefit of the country. For this purpose, in 1923, the Izmir Economic Congress was convened before the proclamation of the Republic and important decisions were taken to protect and develop the national industry to decrease the country's external dependence, which was inherited from the Ottoman Empire due to the capitulations (Sezgin, 2009).

The period of 1923-1930 was referred to as a liberal period. However, it was also seen that the state was implementing etatist policies to develop domestic industry. This was because, although in the first years of the Republic, industrialization was left to private

sector, private sector could not do this work properly due to the lack of capital accumulation and experience. To help domestic industry develop, Turkey İş Bank was established in 1924, the Industrial Bank and the Maadin Bank were established in 1925. Etibank and Sumerbank, which were the core of the Public Economic Enterprises, were also established in this period (Seyidoğlu, 1994, p. 517). Moreover, in 1927, the "Incentive Industry Law" was launched and young entrepreneurs were encouraged with certain exemptions. They were tax exemptions, land grants, duty-free import permits for investment goods, and reduction in transportation costs (Kazgan, 2009, p. 56).

The figures of the foreign trade in the 1923-1929 period are given in Table 1. Although export increased significantly in the early period of the Republic, Turkey ran foreign trade deficits.

Table 1. Turkish foreign trade for the years of 1923-1929 (million US $)

	Exports		**Imports**				
Years	**Value**	**Change (%)**	**Value**	**Change (%)**	**Balance of Foreign Trade**	**Volume of Foreign Trade**	**Proportion of Imports Covered by Exports (%)**
1923	50.8	-	86.9	-	-36.1	137.7	58.5
1924	82.4	62.3	100.5	15.6	-18.0	182.9	82.1
1925	102.7	24.6	129.0	28.4	-26.3	231.7	79.6
1926	96.4	-6.1	121.4	-5.8	-25.0	217.8	79.4
1927	80.7	-16.3	107.8	-11.3	-27.0	188.5	74.9
1928	88.3	9.3	113.7	5.5	-25.4	202.0	77.6
1929	74.8	-15.2	123.6	8.7	-48.7	198.4	60.6

Source: TURKSTAT

2.1.2. 1930 – 1949 Period

In this period, the state was leading the economic activities and the mixed economy philosophy was employed.

In this period, states in the world tented to implement more protectionist policies instead of market economy due to Great Depression which was erupted in 1929 and whose effects spread all over the world. 1929 Economic Crisis became a milestone for Turkey too. Along with etatist policies, Turkey started to adopt protectionist policies like other countries did after Great Depression. However, Turkey was not also allowed to implement customs policy as she wanted because of some provisions of the Treaty of Lausanne (Akyıldız and Eroğlu, 2004).

1930 and 1931 were transition years in which the protectionist and etatist economic policies prevailed. Law on the Protection of the Value of Turkish Currency and establishment of the Central Bank and the inclusion of etatism in the Republican People's Party program were important developments in these periods.

Even if Turkey did not implement a tight development planning like in the Soviet Union, Tukey was significantly influenced by the development plans of the Soviet Union. In addition to this, implementation of etatist policies brought the first planned development attempt. With the First Five-Year Industrial Plan which was implemented in the period of 1934-1938, the state directly intervened in the economic sphere and started to operate in a planned manner. In this development plan, the state industrialization policy has adopted an import-substitution industrialization model for the production of basic consumer goods and intermediate goods. During the First Five-Year Industrial Plan period, Izmir telephone company and Zonguldak Coal Company were nationalized, industrial enterprise which used domestic resources were supported, success in external debt payments achieved. In addition, this time was the period when the import substitution policy was put into practice, the state established several State Economic Enterprise in industries mainly iron and steel and cellulose industry (Akyıldız and Eroğlu, 2004).

As the first plan was successful, preparations for the Second Five-Year Development Plan were initiated before the First Five-Year Industrial Plan was finished. In the Second Five-Year Development Plan, priority was given to the production of investment goods, unlike the first plan. On the other hand, the Second Five-Year

Development Plan could not be implemented because of the Second World War. Adoption of mobilization due to danger of going to the Second World War in Turkey affected Turkish economy adversely (Akyıldız and Eroğlu, 2004).

In the period of between 1930 and 1938, Turkey has comparatively managed to stay out of the crisis to some extent and had taken important steps in the name of industrialization together with relatively closed economic policy objectives and the public's planning efforts of the industrial enterprises' investments (Eroğlu, 2007). The most important feature of this period in the light of these developments was that Turkey's exports exceeded imports and Turkey ran foreign trade surplus almost entire period as seen in the Table 2. The only exception of this was 1938. As seen from the Table 2, in 1930, 1931 and 1932, export significantly decreased, the reason of which was that Turkey's main trade partner countries were affected by the Great Depression (Kepenek and Yentürk, 2001, p. 47). But, in the period of 1933-1938, both export and imports significantly increased. Regular increase in imports was a result of external dependence of intermediate and investment goods required for the domestic industries. On the other hand, the rise in export volume was made by the increase in the amount of exported agricultural stocks (Seymen, 2009, p. 20-21).

The high-rate devaluation applied in 1946 was considered as a step towards incentive. However, in the following period, due to the lack of measures to ensure internal price stability, the imposition of tax on exports to generate income caused exports to drop in both quantity and value (Sezgin, 2009). Turkey had foreign trade deficit of $21.3 million in 1947. This deficit increased to $78.3 million in 1948, and the period in which the surplus in the balance of foreign trade came to an end (Seymen, 2009, p. 20-21).

Table 2. Turkish foreign trade for the years of 1930-1949 (million US $)

	Exports		Imports				
Years	**Value**	**Change (%)**	**Value**	**Change (%)**	**Balance of Foreign Trade**	**Volume of Foreign Trade**	**Proportion of Imports Covered by Exports (%)**
1930	71.4	-4.6	69.5	-43.7	1.8	140.9	102.6
1931	60.2	-15.6	59.9	-13.8	0.3	120.2	100.5
1932	48.0	-20.3	40.7	-32.1	7.3	88.7	117.8
1933	58.1	21.0	45.1	10.7	13.0	103.2	128.8
1934	73.0	25.7	68.8	52.5	4.2	141.8	106.2
1935	76.2	4.4	70.6	2.7	5.6	146.9	107.9
1936	93.7	22.9	73.6	4.2	20.1	167.3	127.2
1937	109.2	16.6	90.5	23.0	18.7	199.8	120.6
1938	115.0	5.3	118.9	31.3	-3.9	233.9	96.7
1939	99.6	-13.4	92.5	-22.2	7.1	192.1	107.7
1940	80.9	-18.8	50.0	-45.9	30.9	130.9	161.7
1941	91.1	12.5	55.3	10.6	35.7	146.4	164.5
1942	126.1	38.5	112.9	103.9	13.2	239.0	111.7
1943	196.7	56.0	155.3	37.6	41.4	352.1	126.6
1944	178.0	-9.5	126.2	-18.7	51.7	304.2	141.0
1945	168.3	-5.4	97.0	-23.2	71.3	265.2	173.5
1946	214.6	27.5	118.9	22.6	95.7	333.5	180.5
1947	223.3	4.1	244.6	105.8	-21.3	467.9	91.3
1948	196.8	-11.9	275.1	12.4	-78.3	471.9	71.5
1949	247.8	25.9	290.2	5.5	-42.4	538.0	85.4

Source: TURKSTAT

2.1.3. Partial Liberalization Period (1950-1962)

Multi-party system emerged in Turkey together with the establishment of the Democratic Party in 1946. This development brought a significant policy change in the economic field as well as in the political area. Reducing the public's role in the economy and implementation liberal policies that prioritize the private sector were wanted to adopt. However, during the period of the Democratic Party, instead of decreasing the role of the state in the economy, state intervention enhanced with the rise in the number of State Economic Enterprises (Takım, 2012).

Closed and inward-oriented economic policies were rapidly abandoned, and a free trade regime was implemented and foreign markets-oriented approach was followed from

1950 until to 1954, during the period that Democratic Party was ruling. Imports increased, which made the external deficits chronic. Beginning from the second half of the 1940s, Turkey begun to take significant amounts of foreign aids, which prevented the formation of foreign exchange shortages for a while. Thus, the chronic trade deficit was funded by foreign aids and these foreign aids could not lead to an external debt problem until the second half of the 1950s for Turkey. However, the way in which chronic trade deficit was funded had played a major role in accelerating the creation of foreign currency dependence conditions. This process has made the foreign currency dependence increasingly visible (Kanca, 2012).

In the middle of the 1950s, new aids demanded by Turkey were rejected by Western countries that used increasing external debt as an excuse. Therefore, Turkey's economy faced the crisis in 1955 together with increasing foreign trade deficit and external debt.

Since 1954, as a result of the plunge in foreign trade and agricultural sector, the industrialization policy based on agriculture and foreign trade was abandoned. Instead, Turkey tried to continue industrialization efforts returning to import substitution and protectionist policies in addition to devaluation. However, the impacts of the economic crisis deepened in 1958 and Turkey devalued TL again (Akyıldız and Eroğlu, 2004). As a result of the continuous rise in the foreign trade deficit, after 1958, stabilization measures were applied, and imports were tried to be controlled via the tariffs and quantity restrictions. The devaluation made the import expensive, which reduced production in industries using foreign inputs. When this situation combined with the reduction of loans, unemployment became the most important socioeconomic problem of this period (Takım, 2012).

In short, the 1950s were the years when the political and economic environment started to change in Turkey. In 1950, liberalization policies were attempted to be adopted in foreign trade, however the implemented policies enhanced the foreign trade deficit very fast. After the economic developments and devaluation between the years of 1950 and 1962, the foreign trade figures of Turkey are seen in Table 3. Moreover, foreign trade deficit increased in this period.

Table 3. Turkish foreign trade for the years of 1950-1962 (million US $)

	Exports		Imports				
Years	**Value**	**Change (%)**	**Value**	**Change (%)**	**Balance of Foreign Trade**	**Volume of Foreign Trade**	**Proportion of Imports Covered by Exports (%)**
1950	263.4	6.3	285.7	-1.6	-22.2	549.1	92.2
1951	314.1	19.2	402.1	40.8	-88.0	716.2	78.1
1952	362.9	15.5	555.9	38.3	-193.0	918.8	65.3
1953	396.1	9.1	532.5	-4.2	-136.5	928.6	74.4
1954	334.9	-15.4	478.4	-10.2	-143.4	813.3	70.0
1955	313.3	-6.4	497.6	4.0	-184.3	811.0	63.0
1956	305.0	-2.7	407.3	-18.1	-102.4	712.3	74.9
1957	345.2	13.2	397.1	-2.5	-51.9	742.3	86.9
1958	247.3	-28.4	315.1	-20.7	-67.8	562.4	78.5
1959	353.8	43.1	470.0	49.2	-116.2	823.8	75.3
1960	320.7	-9.3	468.2	-0.4	-147.5	788.9	68.5
1961	346.7	8.1	507.2	8.3	-160.5	853.9	68.4
1962	381.2	9.9	619.4	22.1	-238.3	1,000.6	61.5

Source: TURKSTAT

2.1.4. Planned Period (1963 -1980)

The economic policies implemented in the first half of the Democratic Party ruling period led to an improvement in the economy, but this situation could not be moved to the second half of the Democratic Party ruling period. Due to the rise in foreign trade deficit in the second half of Democratic Party ruling period, stabilization measures were taken and imports were restricted. However, these short-term measures brought unemployment. The continuation of the process in this way and the political and social tensions in the country caused the coup of 1960 (Sakarya, 2014).

In the period beginning with 1960, the problems that occurred in the previous period were tried to be solved with the planned development model. This period, based on the understanding of the planning the economy, was different from other periods. The period of 1960-1962 was a transition period for preparation of the planned development

and the transition to the planned period started in 1963 with the First Five-Year Development Plan (Sakarya, 2014).

Until 1980, three development plans were implemented. These are the First Five-Year Development Plan, implemented in 1963-1967 period, the Second Five-Year Development Plan, adopted in 1968-1972, and the Third Five-Year Development Plan during the years 1973-1977. Common characteristics of these development plans were; they took economic and social structure as data, they took economic growth and its annual rate of increase as main indicators, they prioritized industrialization, they were preparing long-term development strategies to meet long-term planning needs (Özdemir, 2014). Plans had to be mandatory targets for public investments, and guidance for private investments. Public sector should achieve the mandatory targets and the private sector should be encouraged by fiscal incentives and protection policy regulations to achieve targets (Kazgan, 2009, p. 95-96).

In the 1960-1980 period, to support domestic production and industrialization, import substitution policy was applied. Therefore, this period was characterized by an inward-oriented approach, along with external dependence resulted from the policies implemented in this period (Boratav, 2010, p. 117).

On one hand, inward-oriented approach included fiscal policies. During this period, in Turkey Keynesian policies were adopted, which were seen as a solution at the point where liberal economy was clogged in the West countries as well after the Second World War (Sakarya, 2014). Public investments in transportation, port, energy and communication in this period paved the way for development of domestic industry.

On the other hand, Turkish economy continued to be dependent on external debt. For instance, there was an external-dependence structure in energy and technology sectors. When local resources were not enough, Turkish economy borrowed from international institutions as she did in the previous period. The import substitution structure, which was implemented in 1960-1970 period, led to an intense debt environment in the late 1960s. The targeted structure in the form of import substitution increased the

dependence on foreign countries by remaining assembly line type of production. The external dependence system was affected by international crises in the 1970s. In this period, when all countries were in a shortage of cash, it was difficult to find a country or institution to barrow money. Problems in balance of payments, lack of capital, and insufficient financial resources resulted devaluation in TL in 1970. Moreover, the oil crisis that emerged in 1973 has made this bottleneck snafu (Sakarya, 2014). After the second oil shock (1979), exports in Turkey remained at a level that could only meet the oil bill, and import difficulties began due to the difficulties in finding external loans. Especially during the 1978-1979 period, there was a complete economic crisis and the TL was devalued twice. World oil shock that worsened the balance of the world economy, cause a threefold rise in foreign trade deficit of Turkish economy (Sezgin, 2009).

The balance of foreign trade appears to have deficit each year between 1963 and 1980 as can be seen from Table 4. Despite the rise in exports throughout the period, trade deficits were seen due to fact that the growth rate of imports was much higher than exports. The foreign trade characteristic of this period were chronic foreign trade deficits and over-import dependence as it had been since 1946 (Boratav, 2010, p. 134). During the period, foreign trade deficits grew year by year and the ratio of exports to imports decreased. There was a steady increase in the export figures from 1970 to 1974. Likewise, there is a continuous increase in imports. However, there was a reduction in exports in 1975 and a very high rise in imports. The reason for this rise is the oil crisis occurred in 1974, and the Cyprus issue in Turkey. Turkey's economy and especially foreign trade were affected adversely from these developments. In parallel with all these developments, it was seen that there was almost tenfold rise in foreign trade volume from 1963 to 1980. The period after 1964 until 1980, except for 1967 and 1978 showed continuous rise in volume of foreign trade in Turkey.

Table 4. Turkish foreign trade for the years of 1963-1980 (million US $)

	Exports		Imports				
Years	**Value**	**Change (%)**	**Value**	**Change (%)**	**Balance of Foreign Trade**	**Volume of Foreign Trade**	**Proportion of Imports Covered by Exports (%)**
1963	368.1	-3.4	687.6	11.0	-319.5	1,055.7	53.5
1964	410.8	11.6	537.2	-21.9	-126.5	948.0	76.5
1965	463.7	12.9	572.0	6.5	-108.2	1,035.7	81.1
1966	490.5	5.8	718.3	25.6	-227.8	1,208.8	68.3
1967	522.3	6.5	684.7	-4.7	-162.3	1,207.0	76.3
1968	496.4	-5.0	763.7	11.5	-267.2	1,260.1	65.0
1969	536.8	8.1	801.2	4.9	-264.4	1,338.1	67.0
1970	588.5	9.6	947.6	18.3	-359.1	1,536.1	62.1
1971	676.6	15.0	1,170.8	23.6	-494.2	1,847.4	57.8
1972	885.0	30.8	1,562.5	33.5	-677.6	2,447.5	56.6
1973	1,317.1	48.8	2,086.2	33.5	-769.1	3,403.3	63.1
1974	1,532.2	16.3	3,777.5	81.1	-2,245.3	5,309.7	40.6
1975	1,401.1	-8.6	4,738.6	25.4	-3,337.5	6,139.6	29.6
1976	1,960.2	39.9	5,128.6	8.2	-3,168.4	7,088.9	38.2
1977	1,753.0	-10.6	5,796.3	13.0	-4,043.3	7,549.3	30.2
1978	2,288.2	30.5	4,599.0	-20.7	-2,310.9	6,887.2	49.8
1979	2,261.2	-1.2	5,069.4	10.2	-2,808.2	7,330.6	44.6
1980	2,910.1	28.7	7,909.4	56.0	-4,999.2	10,819.5	36.8

Source: TURKSTAT

2.2. FOREIGN TRADE POLICIES AFTER 1980

After 1980, the world rapidly moved to more global world and became one single global market. This situation made countries follow liberal and export-oriented policies. Development of globalization in international structure affected firstly developed countries and then the developing countries like Turkey. This period could be considered as a point of Turkey's integration to global network. This period, in which there was an open economic structure, was generally characterized with the concept of liberal period in the science of economics (Sakarya, 2014).

The year 1980 became the year in which Turkey's economy experienced important structural transformation and significant steps were taken in terms of foreign trade. Instead of import substitution industry, export-oriented economic policies were adopted

and completely outward-oriented economic industrialization program was implemented with the decisions taken on the January 24, 1980, which was very significant turning point for Turkish economy.

2.2.1. Outward Orientation of the Economy and the Liberalization Process (1980-1989)

The first step of Decisions of January 24 included characteristics of the stabilization program and was carried out under the control of the coup regime between 1980 and 1983. Second step was the complete liberalization of the economy and the complete removal of barriers to imports. This process came into force in 1984. Finally, in the third step of the program was completed towards the end of the 1980s with the convertibility of TL, the liberalization of financial markets, privatization and globalization (Kazgan, 2009, p. 127).

Turkey took the step to liberalization with the Economic Stabilization Program which was also called Decisions of January 24 that aimed to bring prosperity to economy and integrate into the world markets. In particular, it included the measures to adopt structurally changes in globalizing world after 1980, to take inflation under control, to recover the severe wounds of the 1979 crisis and to ensure a stable growth in the economy etc. (Tüleykan and Bayramoğlu, 2016). Within the framework of the stabilization program in 1980, comprehensive structural changes were made in Turkish economy (Bayrak and Kanca, 2013). Also, with the Decisions of January 24, TL was devalued together with export incentive policy to prevent exchange bottleneck.

The reforms which was tried to be realized with this stabilization program can be summarized as follows (Bayrak and Kanca, 2013):

• Reducing the inflation rate permanently without damaging the growth dynamics in the economy (to ensure price stability),

• Establishment of an export led growth model by abandoning the import substitution model, providing export incentives and subsidies and ensuring import liberalization within this framework (reestablishing the balance of payments),

• Ensuring financial liberalization (activating the market economy),

• Liberalization of foreign capital movements and in this context ensuring convertibility of TL by changing the exchange rate policy (ensuring the economy to open),

• Decreasing the effectiveness of the public in the economy and accelerating privatization efforts.

Some of the policies put forward for the implementation of the mentioned reforms as follows (Bayrak and Kanca, 2013):

• Tight monetary policy

• Positive real interest rate policy (liberalization of interest rates)

• Realistic exchange rate policy (flexible and daily exchange rate application)

• Promotion of foreign capital

• Liberalization of foreign trade by reducing interventions of public sector

• Removal of quotas on imports

• Continuing export promotion

• Pricing of goods and services on the market

Turkey entered a process containing structural transformations which aim to accelerate the market economy by limiting the direct intervention of the state with Decisions of January 24, to integrate the economy with the world economy by opening outside and thus to get rid of foreign exchange bottleneck, to increase saving, investment, employment and production with public spending on robust resources (Karabıyık and Uçar, 2010). Capital Markets Law was enacted and Capital Markets Board was established. The Istanbul Stock Exchange was opened and the Interbank Money Market and Foreign Exchange, Effective Markets were established within the Central Bank and

a new Banking Law was enacted. In addition to this, by implementing tax reform, the implementation of Value Added Tax has been started and various precautions have been introduced to make state owned enterprises more effective and in 1989 capital movements have been liberalized (Bayrak and Kanca, 2013).

In 1984, liberalization of foreign trade and the process of integration with the global economy have begun. Quota lists have been completely removed with the import regime in 1984. Also, the semi-open exchange regime with initiated by the Decree No. 30, which was adopted in July 1984, has become fully open with Decree No. 32,. In 1989, Decree No.32 On The Protection Of The Value Of Turkish Currency has been enacted and a number of new incentives for foreign capital was implemented by way of the decrease of bureaucracy, capital movements and foreign trade liberalized (Akyıldız and Eroğlu, 2004).

The Decisions of January 24 in the economy were initially welcomed and successful results were achieved in the early days. Between 1980 and 1989, as seen in Table 5, exports and imports increased. Increase in exports was observed due to fiscal incentives and the share of industrial products within the exports also increased. The problem of the foreign exchange bottleneck was solved as a result of the rise in exports in the first place. In 1980, exports amounted to $2.9 billion; then increased $11.6 billion in 1989. During the 1980s, in 1983, 1986 and 1989, exports contracted slowly. In addition to these important developments in exports, there were also significant increases in imports due to the removal of restrictive barriers to imports. In 1980, imports were realized as $7.9 billion; then increased $15.8 billion in 1989. The increase in imports from 1980 to 1983 decreased due to the economic policies that contracted growth and reduced domestic demand. Especially in the first years, the growth in exports was faster than the growth in imports and the foreign trade deficit diminished from $5 billion in 1980 to $2.7 billion in 1988. The ratio of exports to imports reached to 81% in 1988 from 37% in 1980.

The positive developments in foreign exchange abundance and balance of payments following Decisions of January 24 were not be successful due to increase in imports,

decrease in production, the heavy operation in the public sector and the foreign trade deficit started again (Karabıçak, 2000).

Table 5. Turkish foreign trade for the years of 1980-1989 (million US $)

	Exports		Imports				
Years	**Value**	**Change (%)**	**Value**	**Change (%)**	**Balance of Foreign Trade**	**Volume of Foreign Trade**	**Proportion of Imports Covered by Exports (%)**
1980	2,910.1	28.7	7,909.4	56.0	-4,999.2	10,819.5	36.8
1981	4,702.9	61.6	8,933.4	12.9	-4,230.4	13,636.3	52.6
1982	5,746.0	22.2	8,842.7	-1.0	-3,096.7	14,588.6	65.0
1983	5,727.8	-0.3	9,235.0	4.4	-3,507.2	14,962.8	62.0
1984	7,133.6	24.5	10,757.0	16.5	-3,623.4	17,890.6	66.3
1985	7,958.0	11.6	11,343.4	5.5	-3,385.4	19,301.4	70.2
1986	7,456.7	-6.3	11,104.8	-2.1	-3,648.0	18,561.5	67.1
1987	10,190.0	36.7	14,157.8	27.5	-3,967.8	24,347.9	72.0
1988	11,662.0	14.4	14,335.4	1.3	-2,673.4	25,997.4	81.4
1989	11,624.7	-0.3	15,792.1	10.2	-4,167.5	27,416.8	73.6

Source: TURKSTAT

2.2.2. The 1990s: Transformation of the Economy (1990-1999)

In the 1990s the globalization gained momentum both in the world and Turkey. Significant developments in communication technology have made everything very close. However, one of the negative effects of this globalization process is that an economic crisis in any country and region in the world can affect all other countries especially through financial markets connected to each other in a short time (Akyıldız and Eroğlu, 2004). Besides, Iran-Iraq War in 1990 and the Gulf Crisis affected adversely Turkey as an open economy (Sakarya, 2014).

In addition, the early general election in 1991 also negatively affected export potential of Turkish economy. Besides, public sector deficits increased in the 1990s. Tax revenues to pay domestic debt were not enough and the public sector deficits were financed by domestic debt along with external debt and resources of the Central Bank of the Republic of Turkey (CBRT). This led to rapid increase in interest rates, in turn,

capital inflows for speculative purposes. Therefore, Turkish Lira appreciated in real terms against foreign currencies, which restricted exports while facilitated imports. In addition to excessive appreciation of TL, labor cost rose; direct and indirect export incentives decreased. As a result, Turkey lost its competitive power rapidly, the internal imbalances of the economy caused by high public deficits created a swift deterioration in the external balance. In particular, imports rose fast, exports decreased and foreign trade deficit surged and reached to an important size. Specifically, it increased to $14 billion in 1993. The CBRT's efforts to balance the foreign exchange rates through selling foreign exchange to the market were not successful. The foreign exchange rate was volatile and financial markets were dominated by uncertainty (Hepaktan, 2008).

Trade deficit was not only problem Turkey confronted in this period. The inflation rate started to increase in 1989 and accelerated after 1990. Increasing in inflation rate caused worsening the income distribution and a rise in the public deficits by losing public revenues' value. Rapid deterioration internal and external balances caused a crucial crisis in money, capital and foreign exchange markets at the beginning of 1994 (Bayrak and Kanca, 2013). After this crisis, Decisions of April 5 1994 were enacted with the purpose of getting rid of the debt problem, decreasing inflation and stabilizing the economy. According to these decisions, it was aspired to stabilization in the economy, however the structural reforms were needed to be implemented for the stability to be permanent (Hepaktan, 2008).

Table 6 indicates foreign trade statistics of Turkey for the period of 1990-1999. As seen in the table, the Turkey's exports in this period have escalated permanently except for 1999. As a result of the high devaluation and economic policies put into practice in 1994, exports increased by 18% and 19.5% respectively in 1994 and 1995. Imports, which amounted to $35.7 billion in 1995, rose by 53.5% compared to the previous year. The customs union agreement with the EU launched in 1996 has been the main reason for the acceleration of imports. In 1996, imports increased by 22.2% to $43.6 billion, and by 11.3% in 1997 to $48.6 billion. In other words, imports in Turkey became more flexible with the attendance of Turkey to "World Trade Agreement" in 1995 and "Custom Union with the EU" in 1996. In 1998, imports decreased by 5.4%. The crisis

began into the financial markets of the Asian countries in 1997 and heavily affected the real economy adversely. Particularly, after the local crisis in 1994, the swiftly rising foreign trade deficit decreased after the Asian Crisis in 1997. Crisis in Asian countries quickly spread to Russia Federation and another global financial crisis emerged in Russian Federation in August 1998. These global financial crises that influenced mostly the developing countries had also influenced Turkey's foreign adversely. In particular, the crisis of the economy of the Russian Federation, which was an important trading partner of Turkey, affected negatively both the contracting services and tourism revenues and the foreign trade relationship. In 1999, while the economic and financial crises in the world had not passed, Turkish economy had been adversely affected the Marmara and Düzce earthquakes. As a result of these, Turkish economy and hence foreign trade were influenced negatively. Exports decreased by 1.4% to $26.6 billion in 1999 (Hepaktan, 2008). Turkey experienced a weak export performance at the end of the 1990s.

Table 6. Turkish foreign trade for the years of 1990-1999 (million US $)

	Exports		**Imports**				
Years	**Value**	**Change (%)**	**Value**	**Change (%)**	**Balance of Foreign Trade**	**Volume of Foreign Trade**	**Proportion of Imports Covered by Exports (%)**
1990	12,959.3	11.5	22,302.1	41.2	-9,342.8	35,261.4	58.1
1991	13,593.5	4.9	21,047.0	-5.6	-7,453.6	34,640.5	64.6
1992	14,714.6	8.2	22,871.1	8.7	-8,156.4	37,585.7	64.3
1993	15,345.1	4.3	29,428.4	28.7	-14,083.3	44,773.4	52.1
1994	18,105.9	18.0	23,270.0	-20.9	-5,164.1	41,375.9	77.8
1995	21,637.0	19.5	35,709.0	53.5	-14,072.0	57,346.1	60.6
1996	23,224.5	7.3	43,626.6	22.2	-20,402.2	66,851.1	53.2
1997	26,261.1	13.1	48,558.7	11.3	-22,297.6	74,819.8	54.1
1998	26,974.0	2.7	45,921.4	-5.4	-18,947.4	72,895.3	58.7
1999	26,587.2	-1.4	40,671.3	-11.4	-14,084.0	67,258.5	65.4

Source: TURKSTAT

2.2.3. 2000 and During the 21st Century

In 1998, Turkey signed a Close Monitoring Agreement with International Monetary Fund (IMF) because of the failure of reducing inflation, increase in budget deficit and

foreign debts, hence the beginning of a debt spiral process, failure of reducing duty losses of public banks and failure of social security reform. In June 1999, this Close Monitoring Agreement was converted to Stand-by Agreement covering a three-year period between 2000-2002 and came into force in December 1999. This program was called as stability program depended on exchange rate and via this program exchange rate anchor practice was adopted (Tokucu and Kaya, 2011, p. 244). In this context, in 2000, the Disinflation Program which includes tight monetary and exchange rate policy with structural transformations in the banking sector was started to be implemented. The objective of this program was to diminish inflation rate and real interest rates and to ensure growth (Bayrak and Kanca, 2013).

Although the inflation rate was reduced by the Disinflation Program adopted in 2000, the demand boom caused by the decline in interest rates on consumer loans prevented inflation from reaching the target level. In other words, the actual inflation rate realized above the target level. The increase in exchange rate under inflation rate because of the exchange rate anchor caused TL to appreciate.

The banks had open positions which led to rise in interest rates by causing shortage of liquidity in the economy in November 2000. The CBRT failed to meet the liquidity needs of the market, leading a financial crisis in November 2000. In other words, the crisis was mainly stemmed from the loss of credibility, which was in turn caused by lack of timely performance of structural regulations, adjournment of foreign credit and fragile structure of banking sector (Tokucu and Kaya, 2011, p. 245). The crisis in the political sphere in February 2001 led to a more severe increase in interest rates by initiating a larger-scale speculative attack on TL than the previous one. Hence, the CBRT lost approximately $6 billion of its reserves. After this crisis, the exchange rate anchor was abandoned and the floating exchange rate regime was started to be implemented with a devaluation of TL (Akyıldız and Eroğlu, 2004).

As a continuation Disinflation Program that was proposed by the IMF, Transition to Strong Economy Program was launched after the February 2001 Crisis. The main aims of this program were to make structural and institutional arrangements for the economy

to achieve stability and competitiveness, to regain the dynamics of sustainable growth, to get rid of the crisis environment, to fight with inflation decisively and to improve the income distribution (Kol and Karaçor, 2012). The program targeted to restructure of financial sector, increase to transparency in state and strengthen public finance, as well as the regulations on the real economy, such as a reduction in public expenditures, an increase in public revenues and a reduction in public sector debt stock policies. The program also took measures to increase competition and efficiency in the economy and social solidarity (Bayrak and Kanca, 2013).

Turkish economy which took significant steps towards to come out of the crisis in 2000, also entered a strong growth period with the help of global environment in the following five years. Moreover, high rates of rise in exports and production were accomplished, inflation rates fell and fiscal discipline was accomplished relatively in the period of 2002-2007. Furthermore, the tight monetary and fiscal policies adopted with structural reforms ensured confidence and stability in the economy to a great extent (Acar, 2013).

In 2000, exports increased only by 4,5%. However, imports boomed and grew by 34%. Turkey displayed a great performance in exports in the period of 2001- 2004. Turkey's exports increased by 12.8%, 15.1%, 31% and 33,7% respectively in these four years. In 2000, a sharp reduction in interest rates, real appreciation of TL and a steep rise in crude oil prices brought about a 34% increase in imports. After such a rise, imports dropped by 24% in 2001. 2002 and 2003 became the years of improvement after the crises in 2001, when imports and economy enhanced along with. Imports rose by 24.5% , 34.5%, 40.7% in 2002, 2003 and 2004 respectively.

There were also rapid developments in foreign trade in the period of 2002-2007. Exports rose from $36 billion in 2002 to $107 billion in 2007, showing a great leap. Parallel to this, imports surged from $50 billion in 2002 and to $170 billion in 2007.

Since mid-2007, the problems in mortgage credits in the US have led to a huge uncertainty over financial markets. This uncertainty was then replaced by a liquidity problem, and its effects spread rapidly on the global markets and the result became the

global crisis. The global crisis that started in mid-2008 has deepened especially in the first half of 2009 (Bayrak and Kanca, 2013). Turkey also affected by the global crisis adversely. In particular, Turkish economy faced a slowdown trend starting from the last quarter of 2008 because of the contraction in the global economy. General slowdown in growth due to the ongoing crisis in the world, had a negative influence on foreign trade of Turkey. In 2009, exports declined by 22.6% as imports contracted by 30.3%. (Acar, 2013).

Although the foreign trade deficit became larger from $34.4 billion in 2004 to $69.9 billion in 2008, the growth rate of foreign trade deficit slowed down from 2004 to 2008. Starting from October 2008, imports declined more rapidly than exports and had a favorable impact on balance of foreign trade with the decline in oil prices. Consequently, the foreign trade deficit declined to $38.8 billion as of the end of 2009 (Acar, 2013).

Exports and imports increased rapidly in 2010 and 2011 compared to 2009, however the rate of increase in imports was much higher than exports. In particular, during the crisis due to shrinking demand in the EU countries, Turkey succeeded in diversifying its export market strategy in parallel to increasing exports to the MENA countries, and thus limiting the slowdown in total exports. The foreign trade deficit, which declined rapidly in 2009, increased at record levels because of the much higher rate of increase in imports compared to exports in 2010 and 2011. Imports, which was $170.3 billion in 2007, surge to $240.8 billion in 2011. Similarly, exports which were $107.3 billion in 2007 increased to $135 billion in 2011 (Bayrak and Kanca, 2013).

However, due to the contraction in Turkey's export market by the global crisis and the failure to increase the technology level in its production structure, Turkish exports have entered a period of recession in 2013-2016 period and exports in 2016 realized as $142.6 billion dollars. Moreover, imports have also declined in recent years. Therefore, foreign trade deficits became smaller and improved from $105.9 billion in 2011 to $56.1 billion in 2016. In 2017, both export and import increased significantly, and trade

deficit surged again. However, in 2018, trade deficit alleviated due to escalation of export and decrease in imports.

Table 7. Turkish foreign trade for the years of 2000-2018 (million US $)

	Exports		Imports				
Years	**Value**	**Change (%)**	**Value**	**Change (%)**	**Balance of Foreign Trade**	**Volume of Foreign Trade**	**Proportion of Imports Covered by Exports (%)**
2000	27,774.9	4.5	54,502.8	34.0	-26,727.9	82,277.7	51.0
2001	31,334.2	12.8	41,399.1	-24.0	-10,064.9	72,733.3	75.7
2002	36,059.1	15.1	51,553.8	24.5	-15,494.7	87,612.9	69.9
2003	47,252.8	31.0	69,339.7	34.5	-22,086.9	116,592.5	68.1
2004	63,167.2	33.7	97,539.8	40.7	-34,372.6	160,706.9	64.8
2005	73,476.4	16.3	116,774.2	19.7	-43,297.7	190,250.6	62.9
2006	85,534.7	16.4	139,576.2	19.5	-54,041.5	225,110.8	61.3
2007	107,271.7	25.4	170,062.7	21.8	-62,791.0	277,334.5	63.1
2008	132,027.2	23.1	201,963.6	18.8	-69,936.4	333,990.8	65.4
2009	102,142.6	-22.6	140,928.4	-30.2	-38,785.8	243,071.0	72.5
2010	113,883.2	11.5	185,544.3	31.7	-71,661.1	299,427.6	61.4
2011	134,906.9	18.5	240,841.7	29.8	-105,934.8	375,748.5	56.0
2012	152,461.7	13.0	236,545.1	-1.8	-84,083.4	389,006.9	64.5
2013	151,802.6	-0.4	251,661.3	6.4	-99,858.6	403,463.9	60.3
2014	157,610.2	3.8	242,177.1	-3.8	-84,567.0	399,787.3	65.1
2015	143,838.9	-8.7	207,234.4	-14.4	-63,395.5	351,073.2	69.4
2016	142,529.6	-0.9	198,618.2	-4.2	-56,088.7	341,147.8	71.8
2017	156,992.9	10.1	233,799.7	17.7	-76,806.7	390,792.6	67.1
2018*	167,967.2	7.0	223,046.5	-4.6	-55,079.3	391,013.7	75.3

(*) Data for 2018 are provisional.
Source: TURKSTAT

2.3. OVERVIEW OF THE DEVELOPMENTS OF TURKISH FOREIGN TRADE

In sum, Turkey implemented protective policies in foreign trade early the 1930s until the 1960s. Import substitution policies were dominant in the period of the 1960s and the 1970s. Export-oriented policies have started to be applied since the 1980s. In the 1990s, capital account liberalized and, floating exchange rate regime has begun to be employed since 2001.

In addition, trade deficit in Turkey has grown since the 1950s. This increasing trade deficit and trade imbalances has become major challenges for Turkey (Kepenek and Yentürk, 2001, p. 501). Turkey has become a country which has increasing trade deficit especially after 1980 with outward orientation and openness. The progress which has concerned the production and consumption structures in the economy after 1980 has led to exports to be less than imports. Some of the foreign exchange needs of Turkey have started to be covered by hot money inflows with the liberalization of capital movements in 1989, the sustainability of foreign trade deficit has become an important issue for Turkey. In addition, an important development especially after the 1990s emerged in Turkey has been that increasing dependence of production of exports on imported intermediate inputs and imported energy raw materials (oil and natural gas). A significant portion of imports consist of intermediate inputs and energy raw materials such as oil and natural gas (Çelik and İlkay, 2016).

Briefly, the liberalization of foreign exchange, price and trade policies in the 1980s, the commercialization and the Turkey's integration into the world economy in the late 1990s and the early 2000s led to acceleration in Turkish foreign trade. Turkey has experienced, on average, relatively fast export growth. Over the last 15 years, Turkish total exports reached to $168 billion in 2018. In addition, the import content of production has increased substantially. Therefore, total imports also increased to $223 billion in the same period.

Moreover, devaluations of TL are used as tool in handling foreign trade deficit at times (e.g. 1946, 1958, 1970, 1978, 1979, 1980, 1994 and 2001) in Turkey. In addition, TL depreciated in real terms after 2012 except 2014. However, exchange rate policies such as depreciation/devaluation policies could not be very effective for Turkey. There can be some reasons to restrict influence of changes in exchange rate on the balance of foreign trade (Kutlu, 2013). Taşkın (2003) asserts that Turkey's exports highly depend on imports such as intermediate goods. In other words, Turkey has high dependence of exports on imported intermediate goods. This high import dependence leads to Turkey's import demand relatively inelastic and unresponsive to changes in exchange rate policies. In addition, agricultural sector had large share in exports for the pre-1980

period in Turkey and agricultural goods have inelastic supply, hence exchange rate policies would not affect export remarkably. However, share of industry in exports has increased whereas share of agriculture has decreased in the post-1980 period in Turkey. Also, Turkey has not yet enhanced her product range in favor of technology-intensive products. As a result, the anticipated increase in export volume could not be acquired by implementing exchange rate policies (Kutlu, 2013) (ratio of exports of high-tech products in manufacturing industries was 4.3% in 2018 according to TURKSTAT).

2.4. OVERVIEW OF THE TURKISH FOREIGN TRADE WITH THE EUROPEAN UNION

The import regime in Turkey had become subject to radical reforms earlier, in around 1984 when, besides tariff reductions, quantitative restrictions were rapidly phased out and several commodities could be imported (Taymaz and Yılmaz, 2006). In addition, exporters reach almost all countries in the world, though exports tend to be concentrated within the EU. Also, the most important change in the trade regime in Turkey was triggered by the Customs Union which was signed between Turkey and the EU in 1995 and enacted on January 1, 1996 (Taymaz and Yılmaz, 2006). Legal regulations introduced after the Customs Union made important contribution on Turkey's competitiveness and productivity. Turkey's competitiveness in international markets has increased with compliant Turkey's competition policy legislation with the EU standards.

Although the share of the EU in Turkish foreign trade has decreased in the recent years, almost half of Turkish export is done with the EU countries as given the Table 8. The interpretation of this situation could be that Turkey has been looking towards other markets. However, comparing to 1990 figures there is an elevenfold rise in exports to EU and eightfold increase in imports from the EU. Moreover, as of 2018, the share of EU countries in Turkey's total exports was 50% while the share of EU countries in Turkey's total imports was 36.2%.In addition, the share of the EA in Turkey's total export was 34.5% while the share of the EA in Turkey's total imports was 26.5%

according to 2018 data. Hence, strong demand from the EU and/or the EA becomes very crucial for Turkish foreign trade.

Table 8. Bilateral foreign trade between Turkey and the EU (million us $)

	Total Foreign Trade of Turkey		**Turkey's Foreign Trade with the European Union (28)**		**The EU's Share in Turkey's Foreign Trade (%)**	
Years	**Export**	**Import**	**Export**	**Import**	**Export**	**Import**
1990	12,959.3	22,302.1	7,485.2	10,597.2	57.8	47.5
1995	21,637.0	35,709.0	12,232.0	18,033.9	56.5	50.5
1996	23,224.5	43,626.6	12,590.5	24,349.2	54.2	55.8
1997	26,261.1	48,558.7	13,470.9	26,127.5	51.3	53.8
1998	26,974.0	45,921.4	14,837.1	25,297.0	55.0	55.1
1999	26,587.2	40,671.3	15,454.1	22,537.8	58.1	55.4
2000	27,774.9	54,502.8	15,688.0	28,552.3	56.5	52.4
2001	31,334.2	41,399.1	17,575.7	19,840.8	56.1	47.9
2002	36,059.1	51,553.8	20,457.9	25,698.2	56.7	49.8
2003	47,252.8	69,339.7	27,479.4	35,156.8	58.2	50.7
2004	63,167.2	97,539.8	36,698.9	48,130.9	58.1	49.3
2005	73,476.4	116,774.2	41,527.2	52,781.3	56.5	45.2
2006	85,534.7	139,576.2	48,136.6	59,447.5	56.3	42.6
2007	107,271.7	170,062.7	60,746.2	68,472.2	56.6	40.3
2008	132,027.2	201,963.6	63,708.2	74,513.3	48.3	36.9
2009	102,142.6	140,928.4	47,226.9	56,616.3	46.2	40.2
2010	113,883.2	185,544.3	52,933.8	72,390.8	46.5	39.0
2011	134,906.9	240,841.7	62,588.0	91,438.7	46.4	38.0
2012	152,461.7	236,545.1	59,394.4	87,657.3	39.0	37.1
2013	151,802.6	251,661.3	63,038.2	92,457.5	41.5	36.7
2014	157,610.2	242,177.1	68,514.1	88,783.5	43.5	36.7
2015	143,838.9	207,234.4	63,998.2	78,681.3	44.5	38.0
2016	142,529.6	198,618.2	68,343.3	77,501.1	48.0	39.0
2017	156,992.9	233,799.7	73,906.2	85,205.1	47.1	36.4
2018*	167,967.2	223,046.5	83,986.9	80,812.3	50.0	36.2

(*) Data for 2018 are provisional.
Source: TURKSTAT

CHAPTER 3

THE MODEL AND EMPIRICAL ANALYSIS

This chapter includes five subchapters. In the first and second subchapters, the model and the data used in this thesis are introduced, respectively. In the third subchapter, the stationarity of a time series is defined. In the fourth subchapter, the econometric methodology of ARDL model is provided and finally in the last subchapter the empirical results are given and discussed.

3.1. THE MODEL

The model adopted in this study relies on Rose and Yellen (1989)'s model. According to this model, the trade balance equation is set as a function of industrial production index of domestic country as a proxy for domestic income, industrial production index of foreign country as a proxy for foreign income and real exchange rate which proxies the relative price of the domestic and foreign goods . The model is formed as following way:

$$lnTB_t = \beta_0 + \beta_1 lnY\_TUR_t + \beta_2 lnY\_EA_t + \beta_3 lnRER_t + e_t \qquad (3.1)$$

In this model, ln denotes the natural logarithm. TB is the balance of trade in Turkey and is described as a ratio of exports of Turkey to the Euro Area over imports of Turkey from the Euro Area. Y_TUR and Y_EA demonstrate Turkey's and the Euro Area's industrial production indices (as proxy for their income). Thus, the estimates of β_1 and β_2 could be positive or negative. The sign of β_1 is assumed to be negative if an increase in economic growth of Turkey leads to a rise in import from the Euro Area. However, if a rise in economic growth of Turkey is resulted from a rise in the production of substitute goods, this will generate less import for the Turkey and the sign for β_1 is expected to be positive. By the same token, the sign of β_2 may be positive or negative. The sign of β_2 is assumed to be positive if rise in economic growth of the Euro Area generates a rise in imports from Turkey. Nonetheless, if a rise in economic

growth of the Euro Area is because of a rise in the production of substitute goods, this will lead less imports from Turkey and β_2 is expected to be negative. Therefore, there are no a-priori anticipations in the sense of the signs of β_1 and β_2.

Bahmani-Oskooee and Kovyryalova (2008) claime that "short-run volatilities in the balance of trade combining with long-run recovery could generate a much better description of the J-curve." This situation requires the "new definition of J-curve" hypothesis. The new description refers the J-curve as the combining of adverse short-run response of the balance of trade to devaluation of domestic currency with a long-run favorable response. Therefore, in this thesis the new description of J-curve will be analyzed.

As long as there is a relation among balance of trade and real exchange rate in the long-run, the estimated β_(3) is anticipated to be significance and positive in this model for favorable long-run effect. However, the estimated coefficients of real exchange rate in the ECM which is adopted to investigate short-run dynamics are expected to be significance and negative for short-run adverse effects. Hence, new definition of J-curve can be analyzed with combining short-run adverse response of the balance of trade to devaluation/depreciation with a long-run favorable impact.

Studies which use aggregate trade data investigating validity of J-curve may face a problem with this attitude because a domestic currency of a country would appreciate against a foreign currency and contemporaneously depreciate against other foreign currency. Also, a country's balance of trade would recover with one trading partner and contemporaneously worsen with other trading partner. Thus, the weighted averaging would restore the effective exchange rate volatilities (Bahmani-Oskooee and Brooks, 1999). In addition, Rose and Yellen (1989) discuss that when predicting a balance of trade model employing aggregate data one requires to generate a proxy for the rest-of-the-world income. Bahmani-Oskooee and Brooks (1999) state that "this construct is ad hoc at best and at worst misleading" and these problems can be prevented altogether by adopting disaggregated data. Therefore, in this study bilateral trade data is used to avoid aggregate bias problem.

3.2. THE DATA

The Euro Area (19) is a monetary union of 19 of the 28 European Union (28) member states which use the euro as their currency. The Euro Area is composed of Austria, Belgium, South Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain. This study uses the bilateral trade data of Turkey with all countries in the Euro Area except for South Cyprus, because Turkey has no foreign trade relations with South Cyprus. Exports and imports data for Turkey with the Euro Area are acquired from the Turkish Statistical Institute (TURKSTAT).

Industrial production indices where the base year is 2015 are taken as proxy for income of Turkey and the EA. Industrial production index of Turkey is obtained from TURKSTAT and industrial production index of the EA is obtained from Statistical Office of the European Union (EUROSTAT).

The Euro/TL exchange rates data has existed since the beginning of 1999 in the Electronic Data Delivery System (EVDS) of the CBRT because the Euro was launched on January 1, 1999. After three years using the euro as “book money” in addition to national currencies, euro coins and banknotes were adopted on January 1, 2002. In order to form the bilateral real exchange rate, the bilateral nominal exchange rate between TL and the Euro that is described as unit of TL per unit of Euro, is adjusted by the consumer price index (CPI) of both Turkey and the Euro Area as follows:

RER=(NER*CPI_EuroArea)/CPI_Turkey where RER is real exchange rate, NER is the bilateral nominal exchange rate (unit of TL per unit of Euro), CPI_Euro Area and CPI_Turkey represent the consumer prices indices in the Euro Area and Turkey, respectively. The bilateral nominal exchange rate data between TL and Euro is taken from EVDS of the CBRT. The CPI for Turkey where the base year is 2003 and the CPI for the EA where the base year is 2015 are used to covert bilateral nominal exchange rates into bilateral real exchange rates. CPI for Turkey is taken from the TURKSTAT while CPI for the EA is adopted from EUROSTAT. CPI for Turkey is converted into

index in which the base year is selected 2015 in accordance with industrial production indices.

A depreciation of TL against Euro is indicated by an increase in RER because the bilateral real exchange rate variable is described as the unit of TL per unit of Euro. The frequency of the data is monthly and the time period is 2003M1-2018M12 since the data of CPI index for Turkey where the base year is 2003 starts from 2003. Bilateral real exchange rate is converted into index where the base year is selected to be 2015 in accordance with industrial production indices. In addition, industrial production indices are published as seasonally adjusted; the trade balance is seasonally adjusted using Troma/Seats method and bilateral real exchange rate also does not contain any seasonality.

3.3. THE STATIONARITY AND UNIT ROOTS

In order to work with time series, some assumptions must be ensured. One of the most crucial assumptions about time series is stationarity. “The times series data is accepted to be stationary if its mean and variance are constant over time and the value of the covariance between the two time periods depends only on the distance or gap or lag between the two time periods (Gujarati, 2004, p. 797)”. If the time series are non-stationarity, the unit root problem arises and the use of non-stationary time series may reveal a “spurious regression problem” (Granger and Newbold, 1974).

The concept of stationarity can be determined by identifying if the time series includes a unit root (Gujarati, 2004, p. 830). In this context, many unit root tests can be performed to decide whether any time series is stationary or not. The augmented Dickey-Fuller (ADF), unit root test which was put forwarded by Dickey-Fuller (1979) is used commonly in the literature to specify the stationarity of the variables.

In the ADF test, the null hypothesis is that there is a unit root (the time series is nonstationary). The alternative hypothesis is that there is not unit root (the time series is stationary). If the null hypothesis is rejected, it means that the series is stationary. If the

null hypothesis cannot be rejected, it means that the series is not stationary and has a unit root.

To prevent the spurious regression and unit root problem, nonstationary time series should be transformed to make them stationary (Gujarati, 2004, p. 820). If a time series has a unit root, the first differences of such time series can be taken to make them stationary denoted as I(1). If time series will continue to have unit roots despite being in first difference, the cyclical differences should be taken until the non-stationary series is stable denoted as I(2). “In general, if a (nonstationary) time series must be differenced d times to make it stationary, that time series is said to be integrated of order d denoted as I(d) (Gujarati, 2004, p. 805)”.

3.4. THE ARDL MODEL

Although cointegration is basically a method that is developed to examine the correlation among time series with unit roots, it has a feature that allows the understanding of the long-run relation among time series.

According to the cointegration theory, return to equilibrium when there is a deviation from equilibrium or to have temporary deviations from equilibrium is possible only in case of cointegration relationships. Cointegration implies that if individually nonstationary times series is cointegrated, “a linear combination of two (or more) time series can be stationary.” Cointegration of two (or more) time series asserts that there is a long-run, or equilibrium, relationship among them (Gujarati, 2004, p. 830).

To analyze the long-term cointegration among time series, Engle and Granger (1987) method and Johansen (1988) cointegration tests can be applied. According to the cointegration approach developed by Engle and Granger (1987), if the time series is integrated of order one, one can model it at level. However, this approach is applicable only for univariate cointegration approach. If there is more than one cointegrating relationship (multivariate cointegration), Engle and Granger (1987) method cannot be

used. Instead, the methods of Johansen (1988) and Johansen and Juselius (1990) can be employed to determine how many cointegrated vectors there are among variables.

In order to implement the abovementioned cointegration methods, the degree of integration of each variable must firstly be determined. If the integration degrees of the time series are different, Engle and Granger (1987), Johansen (1988), Johansen and Juselius (1990) cointegration methods are not applicable. In other words, time series must be I(1) to perform the methods of Engle and Granger (1987), Johansen (1988) and Johansen and Juselius (1990). The problem arises when the degree of integration of the variables are not be the same order. Therein, Pesaran and Shin (1999) and Pesaran et al. (2001), address this issue by proposing the ARDL approach to test the cointegration relationship among the variables with different order of integrations such as I(0) or I(1).

The Bounds Test which is also known as Pesaran et al. (2001) cointegration approach has some econometric advantages compared to other standard cointegration approach. Firstly, the most important feature of ARDL approach is that this approach does not include pre-testing regression variables, which means that the test for the presence of long-run relation among regression variables in levels is practicable regardless of whether the underlying variables are purely I(0), purely I(1) or mutually cointegrated (a combination of I(0) and I(1) variables). Second, unlike the conventional cointegration method, the ARDL method does not estimate the long-run relation within a system of equations, predict only a single equation. Thirdly, it is possible that different regression variables can have different optimal numbers of lags, which is not possible with other cointegration test. Fourthly, the ARDL approach performs better for small sample size of data (Narayan and Narayan, 2004). Finally, both short-run dynamics and the long-run parameters of the model can be predicted contemporaneously.

The Bounds Test depended on ARDL include testing for cointegration first, and then deriving the relations in the long-run and the ECM in the short-run. From, the equation (3.2), the Unrestricted Error Correction (UEC) version of the ARDL model is estimated to determine the presence of an equilibrium in the long-run and short-run relation without losing long-run information.

$$\Delta \ln TB_t = \beta_0 + \sum_{i=1}^{m} \beta_{1i} \Delta \ln TB_{t-i} + \sum_{i=0}^{m} \beta_{2i} \Delta \ln Y\_TUR_{t-i} + \sum_{i=0}^{m} \beta_{3i} \Delta \ln Y\_EA_{t-i}$$
$$+ \sum_{i=0}^{m} \beta_{4i} \Delta \ln RER_{t-i} + \beta_5 \ln TB_{t-1} + \beta_6 \ln Y\_TUR_{t-1} + \beta_7 \ln Y\_EA_{t-1} + \beta_8 \ln RER_{t-1} + e_t \quad (3.2)$$

Where Δ exhibits first-difference operator and β_0 is intercept, m is the optimal lag lengths for each incorporated series, e_t is the error term.

Within this framework, optimum lag length must be specified before the Bounds Test is adopted. When, the optimum lag length is determined, well known the Akaike Information Criterion (AIC) and/or Schwarz Information Criterion (SIC) can be used. After specification of the optimum lag length, the existence of cointegration relation is investigated. The null hypothesis for absence of cointegration among variables (H0:$\beta_5=\beta_6=\beta_7=\beta_8=0$), is tested against the alternative hypothesis (H1:$\beta_5\neq\beta_6\neq\beta_7\neq\beta_8\neq0$) by using the F or Wald tests.

The long-run coefficients and their asymptotic standard errors are estimated for the chosen ARDL model. The non-standard distribution of the F-statistic obtained by the Bounds Test does not fit the standard F distribution. This is because, the F test used for Bounds Test has a non-standard distribution. Therefore, the calculated (Wald) F-test is compared non-standard critical values computed by Pesaran et al. (2001). The F-test has a nonstandard distribution which is based on; (i) whether variables in the ARDL model are I(0) or I(1), (ii) the number of regressors and (iii) whether the ARDL model includes an intercept and/or a trend. Hence, two sets of critical values are tabulated for a given significance levels by Pesaran et al. (2001). The lower bound critical value is generated presuming that all the regression variables are integrated of order zero (I(0)), while the upper bound critical value is generated presuming that all of the regression variables are integrated of order one (I(1)). Therefore, Pesaran et al. (2001) produce a set in between these two extreme cases including all the possible combinations of variables being I(0), I(1) or even fractionally cointegrated. If computed F-statistic is higher than the upper bound of the critical values, then the H0 is rejected, which suggests that there is a

cointegration among the regression variables. Nevertheless, if the estimated F-statistic is smaller than the lower critical bound, then H0 cannot be rejected and it implies that there is no cointegration among the regression variables. Lastly, if the F-statistic drops into the two critical value bounds then the test result becomes inconclusive.

In the presence of cointegration relationship, ARDL models are formed to identify the long-run relations and short-run dynamics among variables. The ARDL model for the long-run relations among variables is as follows:

$$\ln TB_t = \beta_0 + \sum_{i=1}^{m} \beta_{1i} \ln TB_{t-i} + \sum_{i=0}^{n} \beta_{2i} \ln Y\_TUR_{t-i} + \sum_{i=0}^{p} \beta_{3i} \ln Y\_EA_{t-i} \sum_{i=0}^{q} \beta_{4i} \ln RER_{t-i} + e_t \quad (3.3)$$

From the equation (3.3), m, n, p and q show optimal lags for respective variables. Information criterion e.g. AIC and/or SIC is used in determining optimum lags. From this point the model can be defined as ARDL (m, n, p, q). Long-run coefficients can be computed from the estimated ARDL (m, n, p, q) model. The statistical significance of these coefficients can also be tested.

The ECM depended on the ARDL approach for the short-term relations among the variables are established in equation (3.4).

$$\Delta \ln TB_t = \beta_0 + \sum_{i=1}^{m} \beta_{1i} \Delta \ln TB_{t-i} + \sum_{i=0}^{n} \beta_{2i} \Delta \ln Y\_TUR_{t-i} + \sum_{i=0}^{p} \beta_{3i} \Delta \ln Y\_EA_{t-i} + \sum_{i=0}^{q} \beta_{4i} \Delta \ln RER_{t-i} + \beta_5 ECT_{t-1} + e_t \quad (3.4)$$

The error correction term (lagged one period) (ECT_{t-1}) in equation (3.4) is residuals that are acquired from the computed long-run model. β_5, the speed of adjustment parameter shows that how much of the imbalance in the short-run will be eliminated in the next period. In the other words, it shows short-run dynamics of the model's convergence to equilibrium. In order to work of the ECM, the coefficient of error

correction should be negative and statistically significance. The coefficient (β_5) of the error correction term should be between -1 and 0. 0 indicates that there is no adjustment, whereas -1 shows that there is full adjustment.

3.5. THE EMPIRICAL RESULTS

In this thesis, the existence of J-curve with bilateral trade between Turkey and Euro Area is investigated by applying ARDL technique and Bounds Test approach employing the monthly data for the period of 2003M1-20018M12. Firstly, the unit root test is employed to identify the order of integration of time series. This is because it should be assured that the orders of integration of the time series are not I(2) or higher before applying the ARDL approach to the modelling the variables. Secondly, the Bounds Test is implemented in order to find if there is a cointegration relationship among variables and the ARDL model of the variables are estimated to examine the short-run dynamics and the long-run relationship among the variables in order to investigate the presence of J-curve for Turkish bilateral trade with Euro Area.

Firstly, in order to find the orders of the integration of time series, the ADF is adopted, whose results are showed in the Table 9. “I,T” shows that the model includes intercept and linear trend, “I” indicates that the model includes only intercept, “-” shows that the model does not contain any intercept and linear trend. In selecting the lag length in ADF unit root tests, SIC is employed. According to ADF test results, TB, Y_TUR and RER are integrated order of one I(1) while Y_EA is integrated at the level I(0). In other words, that all series are either I(0) or I(1).

Table 9. ADF unit root test result

	ADF Test Statistic					
Variables	Level			First Difference		
	ADF Test Statistic	p - Value	Intercept (I) Trend (T)	ADF Test Statistic	p - Value	Intercept (I) Trend (T)
lnTB	-0.28	0.99	I,T	-15.64	0.00*	-
lnY_TUR	-2.49	0.33	I,T	-15.47	0.00*	-
lnY_EA	-2.93	0.04**	I			
lnRER	-1.88	0.66	I,T	-10.90	0.00*	-

Note: * and ** show rejection of the null hypothesis of unit root for the ADF tests at 1% and 5% significance levels, respectively.

After confirming that the times series in the model are I(0) or I(1) but none is I(2), the Bounds Test approach is adopted to find the existence of cointegration relationship among the regressors. The optimal lag length is obtained using AIC. A maximum of 8 lags on each first differenced variable is imposed. According to AIC, the ARDL (3,0,3,0) is selected as the best model, because it has the minimum AIC. Then, the Bounds Test is performed by testing the null hypothesis for no cointegration among variables (H_0: $\beta_5=\beta_6=\beta_7=\beta_8=0$), against the alternative hypothesis (H_1:$\beta_5\neq\beta_6\neq\beta_7\neq\beta_8\neq0$). The estimated F-statistic 6.48, given in Table 10, exceeds the upper bound of 4.35 at 5% significance level. This result rejects the null hypothesis and suggests that there is a cointegration relation among variables. .

Table 10. Bounds test result

k	**F-statistic**	**Critical value bounds of the F-statistic at 5% significance level**	
		Lower Bound	**Upper Bound**
3	6.4787	3.23	4.35

Note: k, is the number of independent variables from the equation (3.2). The critical values are acquired from Table CI(iii) (with an unrestricted intercept and no trend with three regressors) in Pesaran et al. (2001).

The results of the ARDL (3,0,3,0) model and long-run coefficients are displayed in Table 11 and Table 12, respectively.

Table 11. The result of the ARDL (3,0,3,0) model

The Coefficient Estimates of the ARDL Model		
Variable	Coefficient	t-Statistic [prob.]
C	-2.418	-4.105 [0.000]*
lnTB(-1)	0.256	3.635 [0.000]*
lnTB(-2)	0.317	4.694 [0.000]*
lnTB(-3)	0.274	3.910 [0.000]*
lnY_TUR	0.019	0.937 [0.350]
lnY_EA	0.215	0.483 [0.630]
lnY_EA(-1)	0.259	0.423 [0.673]
lnY_EA(-2)	-1.540	-2.515 [0.013]**
lnY_EA(-3)	1.334	2.993 [0.003]*
lnRER	0.227	4.504 [0.000]*
Diagnostic Test Results		
R^2	0.8058	
Adjusted R^2	0.7960	
Breusch-Godfrey (Serial Correlation-Autocorrelation Test)	0.361 [0.698]	
Jarque-Bera (Normality Test)	1.305 [0.521]	
Breusch-Pagan (Heteroscedasticity Test-Changing Variance Test)	1.205 [0.295]	
Ramsey Reset Test (Specification Error Test)	0.195 [0.660]	

Note: (*) and (**) show significance level at 1% and 5% respectively. Prob. denotes the p-value of the related coefficient. The figures in the bracelets show the p-value.

The coefficient of income of Turkey is found positive but insignificance whereas the coefficient of income of the EA and the coefficient of real exchange rate is found statistically significance in long-run equation as seen in Table 12. In addition, the estimation results reveal that one percentage increase in income of the EA increases Turkish foreign trade balance by 1.8%. The positive relation between income of the EA and foreign trade balance can be resulted from the increase of external demand for Turkish goods after depreciation of TL. Moreover, the results indicate that one percentage increase in real exchange rate increases balance of foreign trade by 1.5%, which can be because the depreciation of TL ameliorates balance of trade in the long-run.

Table 12. The long-run coefficeint of the ARDL (3,0,3,0) model

The long-run coefficeints		
Variable	Coefficent	t-Statistic [prob.]
lnY_TUR	0.124	0.851 [0.396]
lnY_EA	1.756	2.319 [0.022]**
lnRER	1.486	-11.905 [0.001]*
C	-15.811	-3.718 [0.000]*

Note: (*) and (**) show significance level at 1% and 5% respectively. Prob. shows the p-value of the related coefficient.

Then, ECM is estimated to examine relations among the variables in the short-run. The lagged of error term (ECT_{t-1}) is the series of the residuals that are acquired from the long-run model. The coefficient estimation results of ECM are shown in the Table 13. The error correction term (ECT) is found negative and statistically significance at 5% level. The ECT_{t-1} shows that approximately 15% of error is corrected next period. Nonetheless, the magnitude of speed of adjustment coefficient is found very low and it denotes a gradual convergence to equilibrium.

The coefficients of DlnTB(-1), DlnTB(-2), DlnY_EA(-2) DlnRER are found statistically significance in the short-run. Table 13 shows that the coefficient of first-differenced real exchange rate is positive and statistically significance. The results of this study imply that the exchange rate have a favorable influence on the bilateral trade balance both in the short-run and long-run. Therefore, it can be interpreted that there is no support for the J-curve because negative coefficients of real exchange rate in the short-run are not traced by the positive coefficients in the long-run. In the other words, initial worsening in bilateral trade balance in the short-run is not followed by a recovery in the long-run.

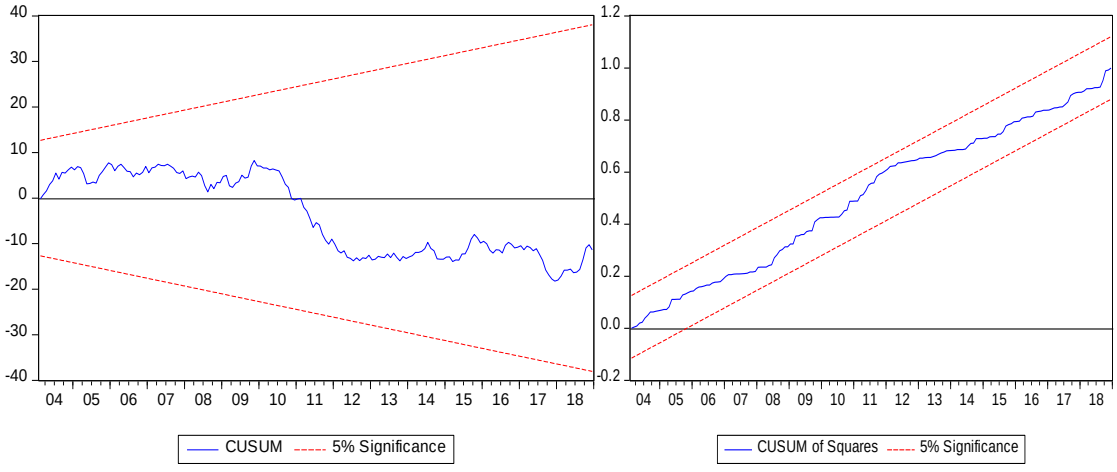
Table 13. Error correction model of the ARDL (3,0,3,0) model

Variable	Coefficent	t-Statistic [prob.]
C	-0.001	-0.127 [0.899]
DlnTB(-1)	0.593	-8.931 [0.000]*
DlnTB(-2)	-0.263	-3.893 [0.000]*
DlnY_TUR	0.180	0.847 [0.398]
DlnY_EA	0.128	0.287 [0.774]
DlnY_EA(-1)	0.188	0.442 [0.659]
DlnY_EA(-2)	-1.369	-3.097 [0.002]*
DlnRER	0.305	-2.246 [0.026]**
ECT_{t-1}	-0.149	-5.131 [0.000]*

Note: (*) and (**) show significance level at 1% and 5% respectively. Prob. denotes the p-value of the related coefficient.

The CUSUM and CUSUMQ test are employed for evaluating parameter stability in the model. Cumulative sum of errors (CUSUM) and cumulative sum of squares errors (CUSUMQ) tests depend on the recursive regression residuals and developed by Brown et al. (1975). Indeed, Brown et al. (1975) compute whether the cumulated sum of the forecast errors is statistically different from zero (Enders, 2015, p. 105). In case of a structural change, the coefficients of the regression model will be affected. If it is concluded that the coefficients are stable according to CUSUM test, it is decided that there is no structural change. The null hypothesis of all coefficients is stable cannot be rejected if the two plots of the CUSUM and CUSUMQ remain within the critical bounds of a 5% significance level, which is the case as it can be seen in Figure 1.

Figure 1. CUSUM and CUSUMQ test result



CONCLUSION

The pattern of trade balance has a crucial role for determinant of current account balance, especially for developing countries such as Turkey. Devaluation/depreciation can be used as a foreign trade policy to surge export and decrease import so it is expected to recover balance of foreign trade and so current account balance. As a result of devaluation/depreciation, exports will become cheaper in foreign currency and imports will be expensive in local currency. Therefore, foreign demand for domestic goods (exports) will increase end domestic demand for goods from abroad (imports) will decrease. Thus, foreign trade balance will improve with the increase of export revenues and decrease in import expenses. In this context, the impacts of depreciation of TL against Euro on the bilateral trade between Turkey and the EA are investigated in this thesis with the concept of J-curve phenomenon because Turkey has close economic ties with the EA. This study can give understanding to determine that depreciation of TL can deteriorate bilateral trade balance between Turkey and EA because of some adjustment lags and stickiness in the short-run or depreciation of TL can rise exports to the EA, reduce imports from the EA and improve bilateral trade among them in the long-run.

Turkey liberalized the trade and put market-oriented economic reforms into practice after Decisions of January 24 1980. Thanks to the trade liberalization policies, the growth rates of export and import increased in the 1980s. Then, although Turkish economy became more integrated the world economy with more liberalized trade and capital accounts in the 1990s, both growth rate of export and import decelerated, and trade deficit widened because of swift growth of imports than exports. Turkey's integration of world economy has speeded up since 2000 by elevating financial relations among countries. In 2000s, due to the improvement in the Turkish economic activity, the growth rates of export and import increased, and global financial ties have strengthened further. Aftermath of the 2008 global financial crisis, Turkey strengthened economic fundamentals and resilience to external shocks. Exports and imports increased rapidly in 2010 and 2011. Turkish exports entered a period of recession in 2013-2016 period. Moreover, imports have also declined in recent years except 2017. In 1946,

1958, 1970, 1978, 1979, 1980, 1994 and 2001, TL was devalued to enhance exports and decrease imports. Some devaluations were successful while some devaluations were failure. In addition, TL depreciated in real terms after 2012 except 2014. Turkey's exports increased and imports decreased in some years in which TL depreciated, however Turkey's exports could not increase and imports could not diminish with the depreciation of TL. Hence, to identify the impacts of depreciation of TL is very crucial for the balance of foreign trade in Turkey.

This thesis aims to investigate the J-curve phenomenon for Turkey bilateral trade with the EA. The ARDL approach and Bounds Test developed by Pesaran et al. (2001) are applied to analyze both short-run dynamics and long-run coefficients using monthly data of the period 2003M1-2018M12. The balance of trade model is described as a function of real bilateral real exchange rate, industrial production index of the EA as a proxy for income of the EA and industrial production index of Turkey as a proxy for income of Turkey. According to Bounds Test cointegration approach based on ARDL model, a long-run relation among variables is found. Therefore, ARDL model is constructed to investigate short-run and long-run relations. According to ARDL model findings, depreciation of TL against Euro (increase in exchange rate) affected positively trade balance and there is a positive relation between income of the EA and foreign trade balance in the long-run. However, income of Turkey is found positive but insignificance. Moreover, according to the ECM formed for short-run dynamics, depreciation of TL recovers balance of trade again. Also, the ECT is found negative and statistically significance at 5% level. The ECT denotes that approximately 15% of error is corrected next period. Consequently, it is found that a depreciation of TL against Euro ameliorates the bilateral trade balance both in the short-run and long-run. Nonetheless, J-curve hypothesis does not hold. According to J-curve phenomenon, depreciation of local currency deteriorates initially balance of trade and then ameliorates after a while in the short run, and then this recovery is expected to proceed in the long-run as well. Moreover, even if the "new definition" is employed, which specifies J-curve as adverse impacts of short-run merged with favorable impacts in long-run, even so J-curve impacts do not exist for bilateral trade between Turkey and the EA.

In this thesis, it is concluded that both bilateral exchange rate and income of the EA have favorable impacts on bilateral trade balance with EA. The coefficients of both variables are found nearly close to each other in the long-run.

However, income of Turkey does not affect trade balance according to both short-run and long-run analysis. It can be interpreted that export companies may perform better than domestic-demand driven companies at periods of economic slowdown due to weak domestic demand and insufficient investments. Hence, the tendency of the firms towards external markets can support export of good due to the slowdown in domestic demand and this situation gives them a chance to enhance their exports to the EA. Therefore, depreciation with contracted domestic demand can cause rise in exports and improves trade balance (Demirhan and Ercan, 2018). In addition, even if export companies increase their performance at periods of economic growth, imports can be increase more than exports because of high dependence of exports on imported intermediate goods, high domestic demand for imported goods and imported energy. Thus, this worsens balance of trade at the period of economic growth. All in all, insignificance impacts of income of Turkey on trade balance can be attributable to these reasons.

Depreciation of RER leads to increase Turkish competitiveness, however it is not fair to believe that it is the main reason behind the strong export growth because there can be some other macro factors. Turkey is a small open economy and has increased integration with the world economy hence international developments and global factors can affect fluctuations in balance of trade. Also, Turkey is the energy imported country, therefore increase in the energy prices worsens balance of foreign trade in Turkey. To increase the competitiveness of Turkish firms in international trade, enhancing production capacity and moving up from low-to-medium value-added production pattern to high value-added production are needed.

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APPENDIX 1: ETHICS COMMISSION FORM

HACETTEPE UNIVERSITY
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Program: Economics
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APPENDIX 2: ORIGINALITY REPORT

HACETTEPE UNIVERSITY
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MASTER'S THESIS ORIGINALITY REPORT

HACETTEPE UNIVERSITY
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Program: Economics Master's Programme

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APPROVED.
Assoc Prof Dr. Aysen SIVRIKAYA
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