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EXAMINING OF THE FOREIGN DIRECT INVESTMENTS IN INDUSTRIAL SECTOR AND SUBSECTORS HAVE EXPORT-LED OR IMPORT-SUBSTITUTING MOTIVE IN TURKEY

TÜRKİYE'DE SANAYİ SEKTÖRÜ VE ALT SEKTÖRLERE YAPILAN DOĞRUDAN YABANCI YATIRIMLARIN İHRACATA YÖNELİK VEYA İTHAL İKAMECİ MOTİF TAŞIYIP TAŞIMADIĞINA DAİR İNCELEMELER

ABSTRACT

This study was aimed that discuss the affections of FDI on the industrial sector and its subsectors in the case of the Turkish economy. For this purpose, in this study, the import and export of Turkey's industrial goods and industrial subsector goods have been employed as dependent variables. Total foreign direct investment (FDI) in the industrial sector and its subsectors have been used as independent variables. As for control variables, national incomes of OECD-member countries have been used for exports as representative of the real exchange rate and foreign national incomes, and Turkey's national income and real exchange rates have been used for imports. The study period was considered as 2005: Q1-2019: Q2 and analyzes were made by using the ARDL method. It was determined that the FDI inflow into the industrial sector in Turkey had the export-supporting effect, though at a weak level. Out of the 16 industrial subsectors with FDI inflow, it was determined that the inflows had an export-supporting effect in 3 subsectors and also an import-substituting effect in one of these 3 subsectors. It was observed that the import-substituting effect was prominent in 2 subsectors, whereas import-deepening effects were observed in 1 subsector. In other subsectors, the FDI played no role; in other words, it remained neutral. Despite the FDI inflow supporting exports from a general perspective, it can be stated that this capital inflow has weak effects. It can be concluded that a radical change is necessary for the structure of the Turkish economy.
Keywords: Foreign Direct Investment, Export, Import, ARDL estimations.

ÖZET

Bu çalışmada Türkiye ekonomisi örneğinde, Doğrudan Yabancı Yatırımların (DYY) sanayi sektörü ve alt sektörleri üzerindeki etkileri tartışılması amaçlanmıştır. Bu amaçla Türkiye'nin sanayi malları ve sanayi alt sektör mallarının ithalat ve ihracatı bağımlı değişkenler, toplam DYY ise bağımsız değişken olarak kullanılmıştır. Ekonomik İşbirliği ve Kalkınma Örgütü (Organisation for Economic Co-operation and Development [OECD]) üyesi ülkelerin milli gelirleri, reel döviz kuru ve yabancı uyruklu gelirlerin temsili olarak ihracat için kullanılmış, ithalatta ise Türkiye'nin milli geliri ve reel döviz kurları ise kontrol değişkenleri olarak kullanılmıştır. Çalışma dönemi 2005:Q1 - 2019:Q2 olarak ele alınmış ve ARDL yöntemi ile analizler yapılmıştır. Çalışma sonucunda, Türkiye'de sanayi sektörüne DYY girişinin zayıf da olsa ihracatı destekleyici etkisi olduğu belirlendi. DYY girişi olan 16 sanayi alt sektöründen, girişlerin 3 alt sektörde ihracatı destekleyici etkisi olduğu ve bu 3 alt sektörden birinde ithal ikame etkisi olduğu tespit edilmiştir. İthal ikameci etkinin 2 alt sektörde belirgin olduğu, 1 alt sektörde ise ithalatı derinleştirme etkisinin olduğu görülmüştür. Diğer alt sektörlerde DYY hiçbir rol oynamadı; başka bir deyişle tarafsız kaldı. DYY girişi genel olarak ihracatı desteklese de bu sermaye girişinin etkilerinin zayıf olduğu söylenebilir. Türkiye ekonomisinin yapısında köklü bir değişikliğin gerekli olduğu sonucuna varılabilir.
Anahtar Kelimeler: Yabancı Doğrudan Yatırım, İthalat, İhracat, ARDL, Tahmin.

1. INTRODUCTION

The second globalization wave in the world economy, as in the first one, is defined as the trends leading to the liberalization and deepening of foreign trade and capital movements. In studies carried out on the direction of relationships between foreign trade and foreign direct investments (FDI) in the second globalization wave, the year 1980 is considered as the milestone. While foreign trade influenced the FDI in the period before 1980, it is claimed that FDI has influenced the foreign trade since then (Fontagné, 1999: 5). Thus, while the FDI influence foreign trade, it also meets the foreign exchange and saving gaps and may have positive reflections on the growth by contributing to the output.

The FDI inflows into Turkey significantly increased since the year 2005, when the negotiations on the full membership to the EU have begun. Negative shocks in capital inflows were experienced in Global Crisis in the year 2008 and an upwards trend after that crisis turned into a downwards trend together with the political withdrawal of Turkey and the following compromise on the democratic structure. In the present study, the period between the year 2005, when the negotiations on full membership to the EU have begun and which represent the beginning of a suitable dataset, and the year 2019 is analyzed. For this purpose, the period 2005:Q1-2019:Q2 was analyzed using quarterly datasets. The FDI inflows into the industrial sector and its subsectors were taken as the determinants of import and export of the industrial sector and its subsectors, whereas the control variables were the real exchange rate, OECD member countries' national incomes (for export), and Turkey's GDP (for import). Since approx. 70% of Turkey's foreign trade is conducted with OECD-member countries, their national incomes were taken as an explanatory variable for export items because these countries' national incomes would influence Turkey's export via the effects on foreign countries' demand on our products. Seventeen models were established and analyzed for the exports of the industrial sector and its subsectors and seventeen models for the imports of the industrial sector and its subsectors.

From a general perspective, mainly 4 motivations draw attention to FDI inflows into the industrial sector. The first one is the export-led FDI inflow, which aims to make production by making use of the country's source/factor and cost advantages and to inject the products into foreign markets. In this motive, the FDI plays a role in enhancing the export and foreign exchange receipts of the country. The second one is the import-substituting foreign capital, which aims to sell the manufactured products in the same country because the exportation would be difficult due to regulations and/or transportation difficulties of the country. In this motive, the import would decrease and foreign exchange savings would be achieved. The third one is the foreign capital playing no role and remaining neutral. In the fourth one, as in the third motive, the FDI inflow would neither cause any increase in export revenues nor result in foreign exchange savings by reducing the import. However, the products having high income and price elasticity would be important and then injected into the domestic market by partially processing in the country and it would deepen the import. Given all four motives, it can be stated that the fourth motive would not decrease but increase the foreign exchange dependency of the country. In the first two motives, the effectiveness of FDI in decreasing the import and increasing the export is measured by making use of the change in the country's outstanding external debts. Whether export-led or import-substituting, FDI would aim to make profit transfers to the source country after the production. The profit transfers would have effects increasing the liabilities of the country in the long term. If the liabilities increase more than the assets of a country, then the increase in outstanding foreign debt becomes inevitable. It indicates that the FDI expected to increase foreign exchange revenues or enable foreign exchange savings have not fulfilled these functions sufficiently.

The present study aims to discuss the reflections of FDI on the industrial sector and its subsectors in the case of the Turkish economy. From this perspective, the literature examining the relationships of FDI with import and export is reviewed. In the third section, a model is discussed based on the literature review. In the fourth section, the effects of FDI on the import and export of subsectors are econometrically tested. The fifth section, given the results obtained, it is aimed to make a policy conclusion.

2. LITERATURE REVIEW

Although the gradually deepening openness in the global economy turned into closeness and interventionism together with the crisis in the year 2008, the closeness seems outside the agenda because the openness provides diversity, affordability, and quality in consumption. The literature on this subject

generally focuses on the effects of FDI on import and export and if it causes import-substituting or export-led effects.

In a literature review, the time-series analyses carried out by Pacheco-López (2005), Njong and Raymond (2011), Haq (2013), Liu, Burridge and Sinclair (2002), Albahi, Se and Si (2016), Khan, Wang and Hassan (2018), Basılgan and Akman (2019), Zhang ve Song (2000), Kalyoncu, Tuluce and Yaprak (2015), and Tabassum, Nazeer and Siddiqui (2012) draw attention. Among them, some of the studies reporting that FDI increases the import are those carried out by Tabassum et al. (2012) and Gerni, Sarı, Kabadayı and Emsen (2014), whereas the studies reporting that FDI increases the export include those carried out by Zhang and Song (2000), Basılgan and Akman (2019), Albahi et al. (2016), Liu et al. (2002), Haq (2013), Njong & Raymond (2011), Pacheco-López (2005), and Jana, Sahu and Pandey (2017). One of the studies reporting import-substituting effects is the one carried out by Kalyoncu et al. (2015) but no study reporting that there was no effect could be found. In panel data analyses, Simionescu (2014) reported a relationship between FDI and import, Ahmed, Cheng and Messinis (2011) and Kutan and Vuksic (2007), Mitic and Mladen (2016), and Sultan (2013) reported relationships between FDI and export but Stamatiou and Dritsakis (2013) reported that there was no relationship and Chaisrisawatsuk and Chaisrisawatsuk (2007) reported that FDI has effects on both export and import.

As seen in the literature review, different results were obtained depending on the sample countries and periods examined. From this aspect, it can be seen that the FDI is generally export-led in countries implementing open and export-led strategies and having source advantages. However, FDI functions based on an import-substituting motive and it addresses the domestic market especially in the countries having a large domestic market, whereas there also are results suggesting that FDI sometimes doesn't increase the foreign exchange revenues or provide foreign exchange savings but deepens the import. On the other hand, whether through import-substituting or export-led motives, FDI also plays a role in increasing foreign trade.

3. DATA, METHODOLOGY, and METHOD

In sum, the FDI depends on the domestic demand or supply advantage of the country. Accordingly, FDI focusing on the domestic demand would decrease the import (M) via the "import-substituting industrialization", whereas FDI focusing on the supply advantages would increase the export (X) via the "export-led industrialization". Thus, these two situations can be mathematically expressed as follows:

$$m = f(-FDI) \quad (1)$$

$$x = f(FDI) \quad (2)$$

Two more control variables can be added to these two mathematical models. For model (1), the real exchange rate (RK) and the country's national income (Yd) can be added. In model (2), however, the real exchange rate and also the national income(s) of the country (countries) to which the country exports to (Yf) can be added. In the present study, the effects of FDI on M and X for Turkey are discussed and, at this point, the national incomes of OECD-member countries, which have significantly high shares (approx. 70%) in Turkey's foreign trade, were taken into analyses. Thus, the mathematical expressions shown above can be expanded as follows:

$$m = f(fc, rk, ytr) \quad (3)$$

$$x = f(fc, rk, yoecd) \quad (4)$$

These two general forms represent the import and export of industrial goods. In the present study, 16 industrial subsectors were analyzed and it was aimed to determine in which subsectors FDI is import-substituting and in which ones FDI supports the export. For this purpose, in model (3) above, it was planned to use 16 models for m values of subsectors (for import and sub-items) and correspondingly fc values (direct foreign capital investments) specific to the relevant sectors in the estimations. Similarly, in model (4) above, it was planned to use 16 models for x values of subsectors (for export and sub-items) and correspondingly fc values (FDI) specific to the relevant sectors in the estimations. From this aspect, the logarithms of variables were taken and expressed with "l". Thus, the basic mathematical models (3)

and (4) were transformed into the following econometric models representing the long-term relationship:

$$ltm = \beta_0 + \beta_1 lfc_t + \beta_2 lrk_t + \beta_3 lytr_t + u_t \quad (5)$$

$$ltx = \alpha_0 + \alpha_1 lfc_t + \alpha_2 lrk_t + \alpha_3 lyoecd_t + u_t \quad (6)$$

In model (5), ltm refers to the logarithmic total import of industrial goods, lfc to the logarithmic FDI inflow into the industrial sector, lrk to the logarithmic real exchange rate, and lytr to the logarithmic GDP of Turkey.

In model (6), "l" still refers to the logarithms of variables and ltx refers to logarithmic total export of industrial goods, lfc to the logarithmic FDI inflow into the industrial sector, lrk to the logarithmic real exchange rate, and lyoecd to the logarithm of total national incomes of OECD countries.

In the present study, the data period begins with the year 2005, for which the suitable data of FDI can be achieved, and when the negotiations on Turkey's full membership to EU triggering the FDI inflow into Turkey and ends with the year 2019. Since the shortest period for the incomes of Turkey and OECD countries was 3-month, the data were obtained in quarterly form and the study period was set to be 2005:Q1-2019:Q2. The data sources were "TUIK Foreign Trade Statistics (the form of foreign trade translated into NACE-REV.2 according to ISIC Rev4 classification)", "TCMB, EVDS database, Balance of Payments and International Investment Position Statistics (Direct Investments of Non-Residents in Turkey, OECD (2019), Quarterly National Accounts", "OECD National Accounts Statistics (database), https://doi.org/10.1787/data-00017-en (Date of access: October 30th, 2019)" and "TCMB, EVDS Database, Exchange Rate Statistics".

The variables to be used in this study and their explanations are listed below.

Table 1. Data and Abbreviations

Abbreviation	Explanation of Data
TF	Total Foreign Direct Investment
TM	Total İmport
TX	Total Export
XCA	Export of Food, Beverage, and Tobacco Products ($)
XCB	Export of Textile and Clothing ($)
XCC	Export of Leather and Relevant Production ($)
XCD	Export of Wood and Wood-product ($)
XCE	Export of Paper and Paper-product and Pressing and Copying the Printed Media ($)
XCF	Export of Coking Coal and Refined Oil Products ($)
XCG	Export of Chemicals, Chemical Products, and Basic Pharmaceuticals and Materials ($)
XCH	Export of Rubber and Plastic Products ($)
XCI	Export of Other Non-Metallic Mineral Products ($)
XCJ	Export of Main Metal Industry and Fabrication Metal Products (Excluding Machinery) ($)
XCK	Export of Machinery and Equipment (Not Classified Anywhere Else) ($)
XCL	Export of Computers, Electric-Electronic and Optic Products ($)
XCM	Export of Transportation Vehicles ($)
XCN	Export of Furniture and Other Non-Classified Products ($)
XD	Export of Electric, Gas, Vapor, and Air-Conditioning ($)
XE	Water Supply, Canalization, Waste Management, and Remediation Activities ($)
CA	FDI in Manufacture of Food, Beverage, and Tobacco Products ($)
CB	FDI in Manufacture of Textile and Clothing ($)
CC	FDI in Manufacture of Leather and Relevant Production ($)
CD	FDI in Manufacture of Wood and Wood-product ($)
CE	FDI in Manufacture of Paper and Paper-product and Pressing and Copying the Printed Media ($)
CF	FDI in Manufacture of Coking Coal and Refined Oil Products ($)
CG	FDI in Manufacture of Chemicals, Chemical Products, and Basic Pharmaceuticals and Materials ($)
CH	FDI in Manufacture of Rubber and Plastic Products ($)
CI	FDI in Manufacture of Other Non-Metallic Mineral Products ($)
CJ	FDI in Manufacture of Main Metal Industry and Fabrication Metal Products (Excluding Machinery)- Direct Foreign Investment Level ($)
CK	FDI in Manufacture of Machinery and Equipment (Not Classified Anywhere Else) ($)
CL	FDI in Manufacture of Computers, Electric-Electronic and Optic Products ($)
CM	FDI in Manufacture of Transportation Vehicles ($)
CN	FDI in Manufacture of Furniture and Other Non-Classified Products ($)
D	FDI in Manufacture and Distribution of Electric, Gas, Vapor, and Air-Conditioning ($)
E	FDI in Water Supply, Canalization, Waste Management, and Remediation Activities ($)

Table 1. Data and Abbreviations (*Cont.*)

Abbreviation	Explanation of Data
GNP TR	Turkey's Gross National Product – Expenditure Approach (current prices,PPP, seasonally adjusted, $)
GNP OECD	OECD Countries' Total Gross National Product – Expenditure Approach (current prices, PPP, seasonally adjusted, $)
RK	CPI-Adjusted Real Effective Exchange Rate (2003=100)- Level
MCA	Import of Food, Beverage, and Tobacco Products ($)
MCB	Import of Textile and Clothing ($)
MCC	Import of Leather and Relevant Production ($)
MCD	Import of Wood and Wood-product ($)
MCE	Import of Paper and Paper-product and Pressing and Copying the Printed Media ($)
MCF	Import of Coking Coal and Refined Oil Products ($)
MCG	Import of Chemicals, Chemical Products, and Basic Pharmaceuticals and Materials ($)
MCH	Import of Rubber and Plastic Products ($)
MCI	Import of Other Non-Metallic Mineral Products ($)
MCJ	Import of Main Metal Industry and Fabrication Metal Products (Excluding Machinery) ($)
MCK	Import of Machinery and Equipment (Not Classified Anywhere Else) ($)
MCL	Import of Computers, Electric-Electronic and Optic Products ($)
MCM	Import of Transportation Vehicles ($)
MCN	Import of Furniture and Other Non-Classified Products ($)

Using the variables presented above and the model (5), new models were established. In other words, similar to the model (5), the subsectors of the industrial sector (lmca, lmcb, etc.) and the FDI in these subsectors (lfca, lfcb, etc.) were added for each model and, keeping real exchange rate (lrk) and Turkey's income (lytr), 16 models were established. Thus, 17 models including the total import and its sub-items were established. For this purpose, as an example of subsectors import, lmca was used as a dependent variable, and lfca, lrk, and lytr were taken as independent variables. The other models were established with the same logic.

Similar to the mechanism explained above for the import, model (6) was used for modeling the total export of industrial goods. In other words, similar to the model (6), the subsectors of industrial sector export (lxca, lxcb, etc.) and the FDI in these subsectors (lfca, lfcb, etc.) were added for each model and, keeping real exchange rate (lrk) and OECD countries' incomes (lyoecd) the same, additional 16 models were established. Thus, 17 models including the total export and its sub-items were established. For this purpose, as an example of export sub-items, lxca was kept as a dependent variable, and lfca, lrk, and lyoecd were taken as independent variables. The other models were established with the same logic.

In the present study, 34 long- and short-term estimations were made using econometric models determined as 17 export and sub-item models and 17 import and sub-item models.

3.1. Econometric Method

In the present study, Turkey's export in the industrial sector and its subsectors and import in the industrial sector and its subsectors were taken as dependent variables. The models were established for explaining the main industrial export and import and their sub-items. FDI into the Turkish industrial sector and its distribution to the subsectors were taken as explanatory variables in export models, whereas the real exchange rate and OECD-member countries' national incomes were taken as control variables. Moreover, in the import models, FDI into the Turkish industrial sector and the distribution to its subsectors were taken as explanatory variables and the real exchange rate and Turkey's national income were used as control variables. Since the data of the period 2005:Q1-2019:Q2 were analyzed, it was planned to use stationarity tests and then the ARDL analyses.

3.1.1. Stationarity Tests

Since the present study analyzed the quarterly data of the period 2005:Q1-2019:Q2, the false or spurious estimations are highly likely in the macroeconomic time series analyses if the data are not stationary. For this reason, it is necessary to examine the causality relationships by considering the characteristics of time series; otherwise, it would not be possible to rely on the estimations to be made (Tarı, 2002: 373). Since Granger and Newbold (1974) showed that spurious regression may be achieved when working with non-stationary time series, it became a standard to test the stationarity of series in the studies making use of time series. At this point, if the mean value and variance of a series having time dimension show no change in the course of time and if the common variance of series between two periods depends not on the period of calculation of this variance but the distance between these periods, then it can be stated that this series is stationary and the estimations to be made using this series would contain no pseudo-regression (Gujarati, 2003: 713).

3.1.2. ARDL Approach

For the long-term relationship analyses in cases, in which the series is stationary at the same degree, the cointegration analysis is used in the time-series analyses. However, when the series is not stationary at the same degree, the long-term relationships cannot be examined (Çelik, Deniz and Eken, 2008: 6). Rather, it is preferred to perform autoregressive or, as named in the literature, VAR analyses. Other than these methods, it can be seen in the literature of economics that Pesaran, Shin, and Smith (2001) have used bound test analyses [autoregressive distributed lag (ARDL)] in their study on England (Pesaran et al., 2001: 289-291).

In their study, Pesaran et al. (2001) considers the empirical analysis of level relationships as a part of time series econometrics and discusses the literature on unit root and cointegration. On the other hand, the empirical literature before their study emphasizes the estimation of level relationships rather than determining the actual ones. At this point, although the cointegration analysis bridged this gap in the literature of economics, it preliminarily assumes that all of the estimators (xt) trying to explain the significantly dependent variable (yt) are cointegrated at the order of 1 or higher. In other words, for the time series, the dependent variable and independent variable(s) should be stationary at the first difference [I(1)]. In an ARDL approach, even if all the variables being tested are I(0), it is revealed that the problem of testing the presence of level relationships between yt and xt is non-standard. Hence, within the scope of a null hypothesis that there is no relationship between yt and xt in terms of level values, the process defining the yt process accepts that xt estimators are cointegrated only with I(0) and I(1) or reciprocally. In case that it is uncertain if estimators are cointegrated only with I(0) and I(1) or reciprocally, the asymptotic theory developed by Pesaran et al. (2001) provides a simple frame for testing the presence of a level relationship between yt and xt. Additionally, testing the existence of the level relationship between yt and xt of the integration order of the determined estimators is uncertain apriori. For this reason, on the contrary to the known methods of cointegration analysis, this method is not subject to this specific type of problem of preliminary testing. The implementation of the bound test, which was developed by Pesaran et al. (2001), to the equation they used indicates that there is no need for taking a prior position depending on if the variables are not I(1) or I(0). Thus, the analysis in their study was based on the single-equation approach. In conclusion, it was asserted that the situations that might exceed beyond a level relationship including yt would be inappropriate (Pesaran et al., 2001: 315; Sadeghzadeh Emsen, Aksu and Emsen, 2019).

At the first step, ARDL (p, q) (Autoregressive distributed lag) equation developed by Pesaran et al. (2001) and investigating if there is a long-term relationship between the variables is estimated. In the study of Pesaran et al. (2001), the productivity of labor and the unemployment and consequently the form of growth relationships were expressed as follows:

$$\Delta lun_t = b_0 + b_1 lun_{t-1} + b_2 gr_{t-1} + \sum b_3 \Delta lun_{t-i} + \sum b_4 \Delta gr_{t-i} + u_t \qquad (7)$$

Where "l" indicates the logarithms, "un" indicates unemployment, and "gr" indicates the labor productivity. While estimating this equation by using the least-squares method, the maximum lag length is determined for the variables in the equation. Providing that the dependent variable's lag level starts from "1" and that of other variables starts from "0", each lag level until this defined maximum lag length is estimated using Equation (7). Considering the Breusch-Godfrey Sequential Dependence Test statistics and Akaike Information Criteria (AIC) and Schwarz Criteria (SC) values of equations estimated for each lag level, the equation(s) to apply the bound test is selected.

After estimating the model given in Equation (7);

$H_0: b_{1=} b_{2=} 0$ $H_1: b_{1\neq} b_{2\neq} 0$ (Calculated test statistic: F_{III})

$H_0: b_{1=} 0$ $H_1: b_{1\neq} 0,$ (Calculated test statistic: t_{III})

The cointegration relationship is examined by testing the hypotheses specified above. At the test phase, F statistics calculated using the Wald test and t statistics of dependent variable's lagged value are compared to the lower and upper critical values at different significance levels specified in the study of Pesaran et al. (2001: 300-304). If the calculated F and t statistics are beyond these upper and lower critical values, then it can be determined if there is cointegration between the variables. If the F and t statistics are higher than the upper critical value, then it can be stated that there is a cointegration

relationship between the series. However, if the F and t statistics are lower than the lower critical value, then it can be stated that there is no cointegration relationship. When the F and t statistics are between the upper and lower critical values, then it is not possible to make an exact decision about the presence of cointegration.

Adjusting the Equation (7) to Equations (5) and (6) for the present study, the Equations (8) and (9) are obtained:

$$\Delta ltm_t = b_0 + b_1 ltm_{t-1} + b_2 lfc_{t-1} + b_3 lrk_{t-1} + b_4 lytr_{t-1} + \sum b_5 \Delta ltm_{t-i} + \sum b_6 \Delta lfc_{t-i} + \sum b_7 \Delta lrk_{t-i} + \sum b_8 \Delta lytr_{t-i} + u_t \quad (8)$$

$$\Delta ltx_t = b_0 + b_1 ltx_{t-1} + b_2 lfc_{t-1} + b_3 lrk_{t-1} + b_4 lyoecd_{t-1} + \sum b_5 \Delta ltx_{t-i} + \sum b_6 \Delta lfc_{t-i} + \sum b_7 \Delta lrk_{t-i} + \sum b_8 \Delta lyoecd_{t-i} + u_t \quad (9)$$

3.1.3. Error Correction Model

In the bound test approach, the short-term relationship between the variables is estimated using an error correction model based on the ARDL approach. The model used in the study carried out by Pesaran et al. (2011) on England is shown below:

$$\Delta lun_t = c_0 + \sum c_1 \Delta lun_{t-i} + \sum c_2 \Delta gr_{t-i} + HDT_{t-1} \quad (10)$$

At this point, by estimating the logged variables in form of differences, the short-term effects are revealed. For the error correction model (HDT) in the present study, the short-term forms of the long-term relationships of (8) and (9) were obtained as Equations (11) and (12) by making use of HDT.

$$\Delta ltm_t = c_0 + \sum c_1 \Delta ltm_{t-i} + \sum c_2 \Delta lfc_{t-i} + \sum c_3 \Delta lrk_{t-i} + \sum c_4 \Delta lyoecd_{t-i} + HDT_{t-1} \quad (11)$$

$$\Delta ltx_t = c_0 + \sum c_1 \Delta ltx_{t-i} + \sum c_2 \Delta lfc_{t-i} + \sum c_3 \Delta lrk_{t-i} + \sum c_4 \Delta lytr_{t-i} + HDT_{t-1} \quad (12)$$

4. APPLICATION RESULTS

In the present study, the period between 2005 and 2019 is examined by using quarterly data. From this aspect, the process will be initiated with the time-series analyses. In time-series analyses, it is important if the series is stationary or not. Thus, it is aimed to prevent the pseudo-regression problem by investigating the stationarity of series. On the other hand, the idea of using ARDL analyses, which allow estimation regardless of the stationarity of series, is based on the search for the model and problem, which will arise based on the stationarity of 51 variables to arise as a result of estimations and 34 models to be used. Thanks to these analyses, it would probably be possible to prevent potential complexity.

4.1. Unit Root Test Results

In examining the stationarity of series used in the present study, the Augmented Dickey-Fuller (ADF) unit root test developed by Dickey and Fuller (1981) and having a normally distributed error term was used. The results obtained are presented in Table 2.

Table 2. ADF Unit Root Test Results of Variables

Variables	Level Values			First Difference Values		
	w/ Constant	w/ Constant and Trend	w/o Constant and Trend	w/ Constant	w/ Constant and Trend	w/o Constant and Trend
lrk	-2.7407	-2.7407	-0.8709	-8.5828[a]	-8.6897[a]	-8.5203[a]
lytr	-2.2327	-0.8341	6.0721	-6.1707[a]	-6.6324[a]	-2.6044[a]
lyoecd	-0.6787	-3.691[b]	2.7173	-3.3841[b]	-	-1.8952[c]
lca	-6.7535[a]	-6.8069[a]	0.1778	-	-	-9.4270[a]
lcb	-6.0435[a]	-6.1083[a]	-0.3581	-	-	-7.4097[a]
lcc	-2.9464[b]	-3.2632[b]	-2.2985[b]	-	-	-
lcd	-6.4274[a]	-6.4379[a]	-5.7260[a]	-	-	-
lce	-8.3914[a]	-8.3148[a]	-0.0974	-	-	-8.8254[a]
lcf	-4.9136[a]	-4.8731[a]	-2.9739[a]	-	-	-
lcg	-7.2467[a]	-7.3208[a]	-0.3463	-	-	-14.7211[a]
lch	-7.2461	-7.1893[a]	-0.2962	-	-	-10.8348[a]
lci	-6.1228[a]	-6.0001[a]	-1.3588	-	-	-10.9864[a]
lcj	-5.7930[a]	-5.7062[a]	-0.0472	-	-	-10.3798[a]
lck	-4.1835[a]	-4.5294[a]	-0.4774	-	-	-8.6651[a]
lcl	-5.1010[a]	-5.3407[a]	0.5435	-	-	7.6212[a]
lcm	-8.7810[a]	-8.8636[a]	-0.7569	-	-	-7.8893[a]
lcn	-2.8223[c]	-3.1200	-0.0612	-11.7857[a]	-11.7026[a]	-11.8591[a]
lcdd	-10.0788[a]	-9.3154[a]	0.4032	-	-	-7.2015[a]
lcee	-5.3692[a]	-5.3452[a]	-3.0258[a]	-	-	-
lmca	-2.2690	-2.7956	1.0869	-9.8273[a]	-9.8851[a]	-9.7418[a]
lmcb	-2.3934	-1.7780	0.34998	-3.8844[a]	-4.5391[a]	-3.9112[a]
lmcc	-1.8809	-1.8389	-0.5835	-3.9371[a]	-4.4021[a]	-3.9780[a]
lmcd	-1.8775	-0.9672	-1.6139	-3.3409[b]	-3.8787[b]	-3.3959[a]
lmce	-2.7044[c]	-3.1359[c]	0.7846	-6.9457[a]	-7.1074[a]	-6.8737[a]
lmcf	-2.5765[c]	-2.4104	0.1872	-8.0958[a]	-8.2971[a]	-8.0683[a]
lmcg	-2.3228	-3.0956	0.9108	-6.6211[a]	-6.7431[a]	-6.5424[a]
lmch	-2.4863	-2.4256	0.5841	-4.3750[a]	-4.6832[a]	-4.2556[a]
lmci	-2.5229	-3.3636[c]	0.3907	-7.3523[a]	-7.5580[a]	-7.4011[a]
lmcj	-3.0941[b]	-3.6357[b]	0.3006	-	-	-8.4820[a]
lmck	-2.8401[b]	-2.7011	-0.0902	-	-3.3602[c]	-3.2594[a]
lmcl	-2.1385	-2.0267	0.3045	-4.1711[a]	-4.7315[a]	-4.1192[a]
lmcm	-2.5090	-3.0799	0.0520	-4.0019[a]	-4.1199[a]	-4.0635[a]
lmcn	-2.7800[c]	-2.2886	1.1041	-11.6279[a]	-11.8703[a]	-11.5469[a]
lmdd	-1.6139	-1.4178	0.0336	-9.4013[a]	-9.5144[a]	-9.4844[a]
lmee	-2.6229[c]	-2.6209	0.3504	-6.9755[a]	-6.9405[a]	-7.0134[a]
lnk	1.9531	-0.8005	3.8772	-6.3972[a]	-6.9644[a]	-5.5447[a]
ltf	-4.7336[a]	-4.6379[a]	0.1294	-	-	-8.4554[a]
ltm	-2.9620[c]	-3.2018[c]	0.2935	-4.1677[a]	-4.3625[a]	-4.1730[a]
ltx	-2.2053	-3.3449[c]	1.3785	-4.9421[a]	-5.0606[a]	-4.7018[a]
lxca	-1.3151	-1.8113	1.1056	-2.9093[b]	-2.9748	-2.6832[a]
lxcb	-1.9673	-2.4791	0.7806	-6.6678[a]	6.6604[a]	-6.6563[a]
lxcc	-1.6615	-2.9933	1.1770	-2.6037[c]	-2.6734	-2.2953[b]
lxcd	-2.3287	-2.2200	1.8082	-10.8923[a]	-4.3939[a]	-10.5037[a]
lxce	-1.5596	-2.5449	2.7911	-9.6006[a]	-9.6556[a]	-8.6382[a]
lxcf	-3.2826[b]	-3.2325[c]	0.4429	-	-7.1466[a]	-7.2159[a]
lxcg	-1.8917	-3.0618	1.6628	-6.5804[a]	-6.5804[a]	-8.7146[a]
lxch	-2.6510[c]	-2.5635	1.0964	-3.4533[b]	-3.8376[b]	2.3890[b]
lxci	-3.1154[b]	-3.1754[c]	0.9383	-	-3.8524[b]	-3.5814[a]
lxcj	-3.0117[b]	-3.2515[c]	0.7308	-	-10.0812[a]	-10.04517[a]
lxck	-2.1707	-3.7577[b]	1.1503	-3.4424[b]	-	-3.0351[a]
lxcl	-2.6174[c]	-3.1258	0.7050	-2.8294[c]	-3.5461[b]	2.7597[a]
lxcm	-2.0644	-3.3247[c]	1.3819	-6.7045[a]	-6.6660[a]	-6.4981[a]
lxcn	-1.0040	-2.1004	2.3952	-12.7313[a]	-12.6351[a]	-11.9819[a]
lxdd	-4.3078[a]	-4.4029[a]	-0.2716	-	-	-8.46838[a]
lxee	-2.6181[c]	-3.8304[b]	0.7627	-4.9377[a]	-	-4.9266[a]

Note: Significant at the level of [a] 1%, [b] 5%, and [c] 10%

It can be seen in the stationarity test that, among the series, the variables lrk, lytr, and lyoecd used as control variables were stationary at I(1). It can also be seen that the import and export of the industrial sector and its subsectors in general and some of the FDI in the industrial sector and its subsectors are stationary at I(0), and some others are stationary at I(1). Since 34 models to be used here and 51 variables used in estimating these models are not uniformly stationary in the unit root tests, it is thought that the ideal method is the bound test method. In sum, in order to examine both ıf short- and long-term relationships, short-term estimations can be achieved by making use of ARDL estimation results and consequently the error correction models in such a structure.

4.2. ARDL Estimation Results and Error Correction Models

The bound test approach, as with other cointegration methods, doesn't require the variables to be stationary at the same level. The bound test approach allows estimating both short- and long-term relationships between the variables in the model.

The critical values of the Wald test (i.e., F test and t test) used in the ARDL approach are presented in Table 3 and these critical values were used in interpreting Table 4.

Table 3. F and T Critical Values for ARDL

Table CI (iii) Case III: Unrestricted intercept and no trend			Table CII (iii) Case III: Unrestricted intercept and no trend		
Level of Sign.	I (0)	I (1)	Level of Sign.	I (0)	I (1)
10%	2.72	3.77	10%	-2.57	-3.46
5%	3.23	4.35	5%	-2.86	-3.78
1%	4.29	5.61	1%	-3.43	-4.37

Note: Critical table values for Fiii test (k=3), Pesaran et al. (2001), J. Appl. Econ. 16: 289–326 (2001): pg. 300 and Critical table values for tiii test (k=3) Pesaran et al. (2001), J. Appl. Econ. 16: 289–326 (2001) pg: 303.

In the present study, the dependent variable was the total export of industrial goods, whereas the independent variables were total FDI in the industrial sector (tfc) and real effective exchange rate (rk), as well as the national incomes of OECD-member countries (yoecd) representing the national incomes of counter countries. The results of ARDL estimations made for long-term relationships by using Equations (8) and (9) and short-term relationships by using Equations (11) and (12) for the period of 2005:Q1-2019:Q2 are presented in the table below.

Table 4. ARDL Estimation Results for Export and İmport by the Industrial Sector and Its Subsectors

Dependent	Long-Term Coefficients							Diagnostic Tests			
Variable	ltf_t	lrk_t	$lyoecd_t$	ltr_t	hdt_{t-1}	F_{iii}	t_{iii}	χ^2_{SC}	χ^2_{HET}	χ^2_{NOR}	χ^2_{FF}
ltx_t	***0.1410*** $^{(c)}$	0.4324	-1.6449 $^{(a)}$	---	-0.209 $^{(a)}$	3.652 $^{(c)}$	1.843 $^{(c)}$	0.99	8.71	2.40	0.41
(3,1,0,1)	***(0.082)***	(0.498)	(0.539)		(0.0471)			[0.60]	[0.64]	[0.30]	(0.52]
ltm_t	-0.0634	0.9257 $^{(b)}$	---	0.8162 $^{(a)}$	-0.355 $^{(a)}$	5.075 $^{(a)}$	-3.218 $^{(a)}$	0.11	17.09	0.84	0.34
(5,1,0,7)	(0.067)	(0.407)		(0.169)	(0.4508)			[0.94]	[0.31]	[0.65]	[0.56]
$lxca_t$	0.00532	1.6626 $^{(b)}$	3.2596 $^{(a)}$	---	-0.258 $^{(a)}$	3.022 $^{(c)}$	-2.650 $^{(b)}$	2.45	15.05	11.94	0.49
(6,0,2,1)	(0.042)	(0.673)	(0.647)		(0.0634)			[0.29]	[0.23]	(0.00]	(0.48]
$lmca_t$	0.0003	1.1140 $^{(a)}$	---	1.1927 $^{(a)}$	-0.516 $^{(a)}$	5.622 $^{(a)}$	-4.348 $^{(b)}$	2.11	13.0	2.91	0.85
(5,0,0,0)	(0.026)	(0.320)		(0.140)	(0.0932)			[0.71]	[0.11]	[0.23]	[0.35]
$lxcb_t$	***0.0605*** $^{(a)}$	0.1860	1.0546 $^{(a)}$	---	-0.312 $^{(a)}$	7.085 $^{(a)}$	-3.869 $^{(a)}$	1.28	8.23	3.41	0.01
(1,0,0,1)	***(0.020)***	(0.235)	(0.224)		(0.0506)			[0.52]	[0.14]	[0.18]	[0.93]
lmcb	0.0165	1.1710 $^{(a)}$	---	0.5938 $^{(a)}$	-0.409 $^{(a)}$	*7.556* $^{(a)}$	-4.713 $^{(a)}$	1.31	15.61	0.06	0.02
(5,0,0,2)	(0.022)	(0.290)		(0.119)	(0.0636)			[0.51]	[0.11]	[0.96]	[0.87]
$lxcc_t$	***-0.0241*** $^{(b)}$	0.6434 $^{(c)}$	2.2359 $^{(a)}$	---	-0.302 $^{(a)}$	6.066 $^{(a)}$	3.263 $^{(a)}$	0.32	9.92	0.57	1.43
(5,2,0,1)	***(0.042)***	(0.673)	(0.510)		(0.0524)			[0.85]	[0.53]	[0.74]	[0.23]
$lmcc_t$	***-0.0147*** $^{(c)}$	1.5833 $^{(a)}$	---	0.5773 $^{(c)}$	-0.239 $^{(a)}$	*8.663* $^{(a)}$	-3.589 $^{(a)}$	7.17	5.04	0.22	1.31
(5,0,0,3)	***(0.008)***	(0.461)		(0.119)	(0.0347)			[0.02]	[0.92]	[0.89]	[0.19]
$lxcd_t$	0.0154	0.1328	1.3395 $^{(c)}$	---	-0.286 $^{(a)}$	4.725 $^{(a)}$	-3.123 $^{(a)}$	0.33	7.10	1.50	0.70
(2,4,0,0)	(0.020)	(0.598)	(0.742)		(0.0563)			(0.84	(0.62)	(0.47)	(0.40]
$lmcd_t$	-0.0038	3.9046 $^{(a)}$	---	1.5750 $^{(a)}$	-0.273 $^{(a)}$	7.071 $^{(a)}$	-2.684 $^{(a)}$	0.49	5.50	0.12	5.05
(5,0,0,1)	(0.014)	(1.282)		(0.374)	(0.0439)			(0.78)	(0.78)	(0.93)	(0.02)
$lxce_t$	-0.0258	0.8622	2.5990 $^{(b)}$	---	-0.133 $^{(a)}$	2.203	-1.827 $^{(c)}$	2.33	2.99	3.98	4.91
(5,0,0,1)	(0.023)	(0.771)	(1.018)		(0.0385)			[0.31]	[0.96]	[0.13]	[0.03]
$lmce_t$	0.0110	0.7082 $^{(b)}$	---	0.6535 $^{(c)}$	-0.443 $^{(a)}$	4.848 $^{(a)}$	-4.333 $^{(a)}$	1.28	1.34	11.10	0.36
(1,0,0,0)	(0.007)	(0.275)		(0.119)	(0.0868)			[0.52]	[0.85]	[0.00]	[0.54]
$lxcf_t$	***0.0289*** $^{(c)}$	-0.0930	0.6287	---	-0.235 $^{(a)}$	4.132 $^{(b)}$	-2.346 $^{(b)}$	2.33	2.99	3.98	4.91
(1,0,0,1)	***(0.017)***	(1.582)	(1.498)		(0.0498)			[0.31]	[0.96]	[0.13]	[0.03]
$lmcf_t$	-0.0355	2.5561	---	0.8109	-0.153 $^{(a)}$	2.628	-1.644	1.75	3.22	1.40	0.69
(5,0,0,0)	(0.037)	(1.871)		(0.510)	(0.0406)			[0.41]	[0.91]	[0.49]	[0.40]
$lxcg_t$	-0.1517	-1.1734	0.6019	---	-0.089 $^{(a)}$	3.742 $^{(c)}$	-1.074	0.57	8.46	1.20	3.15
(5,0,0,1)	(0.184)	(2.190)	(3.514)		(0.0198)			[0.74]	[0.48]	[0.54]	[0.08]
$lmcg_t$	-0.0597	0.0623	---	0.5452 $^{(a)}$	-0.187 $^{(a)}$	4.263 $^{(a)}$	-2.517 $^{(b)}$	1.93	7.20	6.61	0.22
(5,0,1,2)	(0.042)	(0.472)		(0.195)	(0.1004)			[0.37]	[0.78]	[0.03]	[0.63]
$lxch_t$	-0.0102	0.4926	0.7304	---	-0.094 $^{(a)}$	3.742 $^{(c)}$	-1.570	5.33	12.11	0.57	1.89
(5,0,0,1)	(0.021)	(0.949)	(1.674)		(0.0171)			[0.06]	[0.20]	[0.74]	[0.17]
$lmch_t$	-0.0046	0.6418 $^{(c)}$	---	1.0149 $^{(a)}$	-0.3167	2.811 $^{(c)}$	-2.609 $^{(b)}$	4.22	20.02	2.13	3.10
(7,0,1,6)	(0.006)	(0.332)		(0.145)	(0.0797)			[0.12]	[0.27]	[0.34]	[0.08]
$lxci_t$	0.0065	0.0592	0.2377	---	-0.155 $^{(a)}$	2.256	-1.368	1.35	5.68	50.56	2.19
(5,0,0,1)	(0.012)	(0.8149)	(0.9758)		(0.044)			[0.50]	[0.77]	[0.00]	[0.14]
$lmci_t$	-0.0002	0.6125 $^{(b)}$	---	0.6673 $^{(a)}$	-0.4466*	10.064 $^{(a)}$	-4.754 $^{(a)}$	6.94	7.78	1.16	2.36
(3,0,0,3)	(0.004)	(0.252)		(0.11)2	(0.0603)			[0.03)	[0.55]	[0.55]	[0.13]

Table 4. ARDL Estimation Results for Export and Import by the Industrial Sector and Its Subsectors (*Cont.*)

Dependent Variable	Long-Term Coefficients					Diagnostic Tests					
	ltf_t	lrk_t	$lyoecd_t$	ltr_t	hdt_{t-1}	F_{III}	t_{III}	χ^2_{SC}	χ^2_{HET}	χ^2_{NOR}	χ^2_{FF}
lxcj $_t$	***0.1037*** $^{(c)}$	0.6511	1.5981 $^{(b)}$	---	-0.404 $^{(a)}$	3.978 $^{(b)}$	-4.080*	3.30	12.01	0.41	0.41
(1,1,0,0)	***(0.061)***	(0.750)	(0.781)		(0.0872)			[0.19]	[0.03]	[0.81]	[0.81]
lmci $_t$	-0.0395	1.2841 $^{(c)}$	---	1.0176 $^{(a)}$	-0.443 $^{(a)}$	4.124 $^{(b)}$	-3.745 $^{(a)}$	0.39	7.22	1.01	0.17
(1,0,0,0)	(0.054)	(0.732)		(0.302)	(0.0941)			[0.82]	[0.12]	[0.60]	[0.67]
lxck $_t$	***0.0219*** $^{(b)}$	-0.3366	1.0570	---	-0.196 $^{(a)}$	6.015 $^{(a)}$	-2.524 $^{(b)}$	5.37	3.57	1.68	0.47
(5,1,0,1)	***(0.009)***	(0.604)	(0.760)		(0.0343)			[0.06]	[0.93]	[0.43]	[0.49]
lmck $_t$	***-0.0081*** $^{(b)}$	1.3005 $^{(a)}$	---	0.8746 $^{(a)}$	-0.545 $^{(a)}$	7.930 $^{(a)}$	-5.013 $^{(a)}$	0.48	5.99	1.48	0.08
(5,0,0,0)	***(0.003)***	(0.308)		(0.130)	(0.0829)			[0.78]	[0.64]	[0.47]	[0.76]
lxcl $_t$	0.0605	0.1247	0.0899	---	-0.1853*	4.208 $^{(b)}$	-1.526	0.25	14.33	0.32	1.20
(5,0,0,1)	(0.056)	(0.714)	(1.079)		(0.0386)			[0.06]	[0.11]	[0.84]	[0.27]
lmcl $_t$	***0.0209*** $^{(c)}$	0.8979 $^{(a)}$	---	0.8159 $^{(a)}$	-0.825 $^{(a)}$	13.415 $^{(a)}$	7.765 $^{(a)}$	0.59	1.47	0.66	0.08
(1,0,0,1)	***(0.011)***	(0.143)		(0.063)	(0.0971)			[0.74]	[0.91]	[0.71]	[0.77]
lxcm $_t$	0.0956	-0.7612	0.8006	---	0.0759*	3.054 $^{(c)}$	-0.480	0.77	0.48	0.75	10.88
(4,0,1,3)	(0.216)	(2.839)	(2.739)		(0.0759)			[0.67]	[0.48]	[0.68]	[0.45]
lmcm $_t$	***-0.1779*** $^{(a)}$	1.4418 $^{(a)}$	---	1.1795 $^{(a)}$	-1.052 $^{(a)}$	14.933 $^{(a)}$	-5.945 $^{(a)}$	0.99	21.64	0.55	0.73
(4,7,2,7)	***(0.041)***	(0.294)		(0.107)	(0.1136)			[0.60]	[0.54]	[0.75]	[0.40]
lxcn $_t$	0.0194	0.7894	3.4028 $^{(a)}$	---	-0.301 $^{(a)}$	2.057	-2.051 $^{(b)}$	0.80	6.65	2.77	0.92
(2,0,0,1)	(0.012)	(0.534)	(12.189)		(0.0904)			[0.66]	[0.35]	[0.24]	[0.34]
lmcn $_t$	0.0077	0.9409 $^{(a)}$	---	0.6904 $^{(a)}$	-0.465 $^{(a)}$	5.050 $^{(a)}$	-4.732 $^{(a)}$	7.96	9.54	0.21	0.03
(1,0,0,1)	(0.006)	(0.299)		(0.136)	(0.0892)			[0.01]	[0.08]	[0.89]	[0.84]
lxd $_t$	0.0492	-6.634 $^{(c)}$	-7.3886 $^{(b)}$	---	-0.537 $^{(a)}$	4.862 $^{(a)}$	-4.532 $^{(a)}$	1.08	8.21	83.34	0.14
(1,0,0,0)	(0.077)	(3.496)	(3.539)		(0.1051)			[0.58]	[0.08]	[0.00]	[0.70]
lmdd $_t$	0.0039	8.5577	---	3.8976	-0.146 $^{(a)}$	1.070	-1.837 $^{(c)}$	2.52	6.20	8.18	0.13
(1,0,1,0)	(0.138)	(5.742)		(2.360)	(0.0610)			[0.28]	[0.28]	[0.019	[0.71]
lxe $_t$	-0.0294	-2.1626	-2.1190	---	-0.231 $^{(a)}$	3.784 $^{(b)}$	-1.779 $^{(c)}$	0.99	8.71	2.40	0.41
(6,1,0,1)	(0.028)	(1.872)	(2.436)		(0.0508)			[0.60]	[0.64]	[0.30]	[0.52]
lmee $_t$	-0.0002	-1.7143	---	0.2235	-0.219 $^{(a)}$	2.926 $^{(c)}$	-2.474 $^{(b)}$	1.72	15.39	0.42	2.86
(1,0,0,2)	(0.020)	(1.988)		(0.682)	(0.0549)			[0.42]	[0.05]	[0.80]	[0.09]

Note: Significant at the level of $^{(a)}$ 1%, $^{(b)}$ 5%, and $^{(c)}$ 10%. Standard errors are between parentheses and χ^2 values between brackets.

Given the long-term coefficients, it can be seen that FDI (10%) and OECD-member countries' national incomes (1%) were found to have a significant role in the total industrial goods export of Turkey, whereas the real exchange rate was not found to be statistically significant. An interesting point here is that the FDI in Turkey has export-led motives. This finding is in parallel with studies corroborating the export-led approach [See: Zhang and Song (2000), Basılgan and Akman (2019), Albahi et al. (2016), Liu et al. (2002), Haq (2013), Njong and Raymond (2011), Pacheco-López (2005)], and Jana et al. (2017)]. It can be stated that FDI had effects increasing the foreign exchange revenues of the country (as its main target) and it is very important for the country to be able to meet the foreign currency needs for the profit transfers of FDI. However, considering the gradually increasing debt burden, it can also be stated that the capital inflow also has certain shortages. On the other hand, the negative sign of OECD-member countries cannot be explained with an orthodox economic perspective. At this point, given the fact that the increase in national incomes of OECD-member countries decreased the export of Turkey, it can be stated that a portfolio that is appropriate for the incomes and advancements in living standards of OECD-member countries couldn't be offered. Thus, for the period examined here, it might be stated that Turkey's export followed a course that is almost independent of the exchange rate. In other words, it seemed abstracted from the currency-based competitive advantage in the way supporting the literature emphasizing that the export is dependent upon import (See: Gerni tümü, 2008). Moreover, as a result of the analyses performed using autocorrelation (χ2SC), heteroscedasticity (χ2HET), normality (χ2NOR), and functional form (χ2FF) tests among the model diagnostic tests, it was proven that the model established here is sufficient. If it was higher than the F and t statistics of the model and the estimation table at the order of lag selected according to LM statistics, then the critical values were provided for the number of independent variable k=3. Here, tıı statistics of the model selected for the bound test suggest significance in a short-term relationship. Calculated Fıı statistics were found to be 3.652 and it indicates that there is a long-term relationship between the variables in this model at the significance level of 10%. Taking it as a short-term model, the error correction model was used in estimations based on the ARDL approach. Here, as the error term, the value termed hdtt-1 represents the lagged values of the original form. The coefficient representing the hdtt-1 value should have a negative sign and statistically significant. At this point, the coefficient of hdtt-1 value indicates to what extent the difference between the observed value of the dependent variable and the long-term or equilibrium value disappeared in each period. hdtt-1 value was found to be negative and statistically significant at 1% and

the value of -0.2097 indicates that the difference between observed independent values and equilibrium values disappears in 5 quarters. It was found that the industrial goods' export of Turkey was affected negatively in its first lag and positively in the second lag and also the national incomes of OECD-member countries have a positive effect.

The FDI effect on the total import was found to be negative and it indicates that the capital inflows were import-substituting but the level of significance was very low. A negative sign of FDI suggests that import was decreased thus foreign exchange saving was achieved. But it can also be stated that there was an insufficiency in the achieved foreign exchange savings. Besides that, it was also observed that Turkey's export of industrial goods was positively affected by the real exchange rate (5%) and national income (1%). Since the increase in the real exchange rate means TRL gaining value, it cheapens the import and has an increasing effect. Thus, the long-term values yielded findings overlapping with the logic of the economic theory. Considering the short-term effects of the variables on the total import, it can be stated that mainly its own lagged values and national income played an effective role in the total import and these lags generally showed positive effects. On the other hand, hdtt-1 value was found to be negative and statistically significant at 1% and the value -0.3558 suggests that the difference between observed independent values and equilibrium values disappeared in 3 quarters.

Given the effects of FDI inflow on the subsectors in terms of import and export, it can be seen that FDI had significant effects on lxcb, lxcc, and lmcc, lxcf, lxcj, lxck and lmck, lxcl and lxcm subsectors. Within this frame, considering the export/import coverage ratio of those subsectors, implicitly knowing the competitive power in that industry and the share of FDI in the total FDI would be a preliminary analysis for an analytical perspective depending on the scale of foreign capital. Accordingly, for the sectors having significant FDI by the subsectors in long-term coefficients, the temporal changes representing the share of FDI in foreign capital inflow into the industrial sector and the export/import coverage ratio in these subsectors can be seen in Figure 1. Similarly, the shares of these subsectors' export and import in the total export or total import represent their shares in the foreign trade, and the data on this subject are presented in Figure 2.

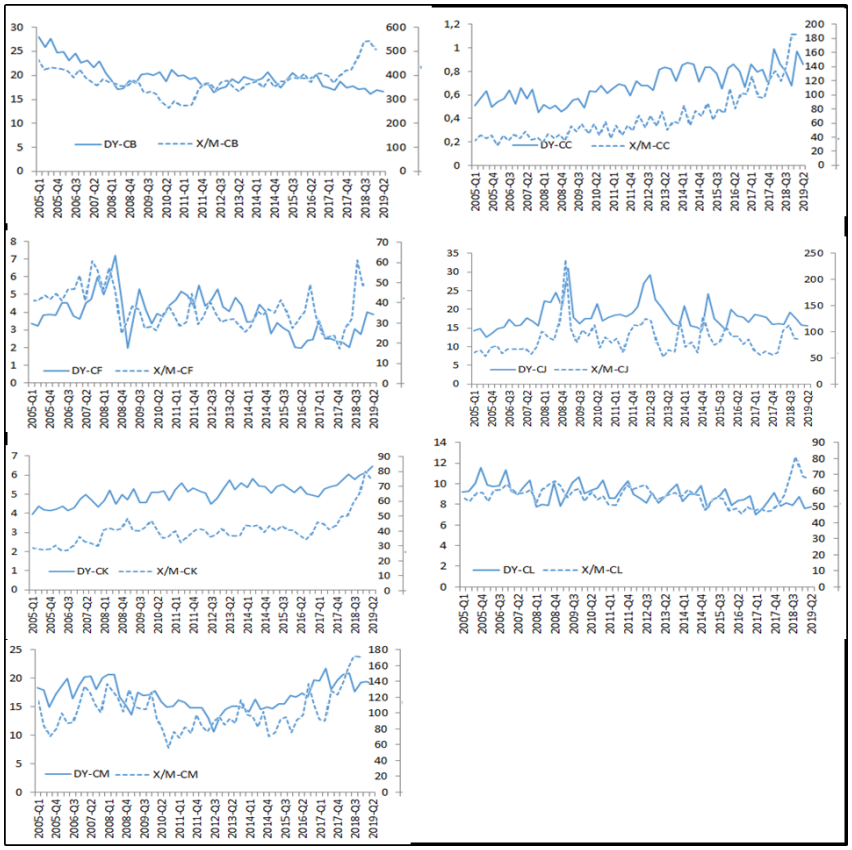

Figure 1. Export/Import Coverage Ratios and the Shares of FDI Inflow into the Sector in the Total

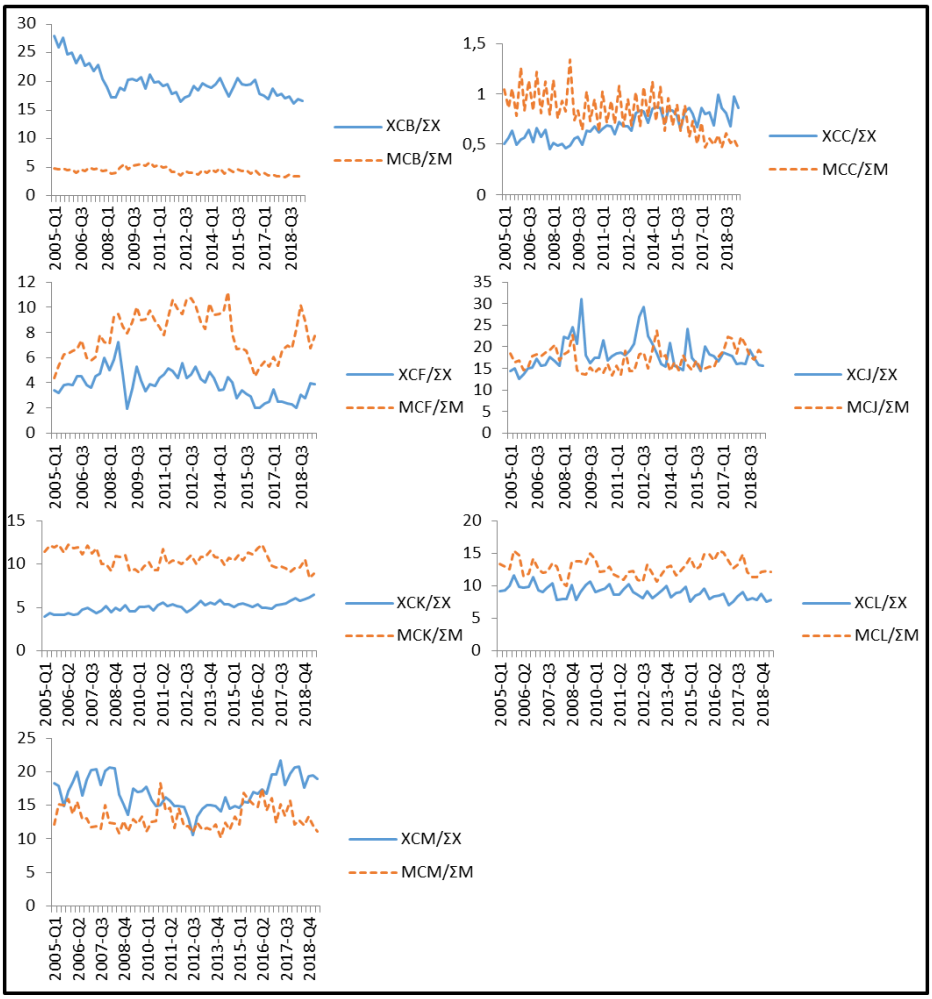

Figure 2. The Shares of Sectoral Export and Sectoral Import in Total Export and Total Export

The results reported in the figures above and in Table 4 will be analyzed as a whole. Accordingly, the industrial subsector receiving the highest FDI was cb (textile and clothing industry) with fluctuations between 15% and 20%. In this sector, the export/import coverage ratio decreased from 500% to 300%. The share of this subsector in the total decreased from 28% to 18% but this subsector has the highest share in Turkey's export. Although this sector slightly losses its highest competitive power and ability to attract the highest level of foreign capital, the FDI in this sector induces export. This finding suggests that, in lxcb, the FDI has a strong motive in parallel with the export-led industrialization argument. The sign of lrk cannot be explained from the aspect of economic theory; as with the explanation of ltx, there is an export structure independent from the exchange rate and consequently the price. On the other hand, lyoecd also has a positive and significant effect on lxcb. From the aspect of short-term relationships, it can be stated that the national incomes of OECD-member countries have a positive and significant effect on lxcb in the long term. hdtt-1 value was found to be negative and statistically significant at 1%. The value -0.3128 indicates that the difference between the observed independent values and the equilibrium values disappears in 3 quarters.

The export/import coverage ratio in sector cc (leather and derivative products) increased from 80% to 150%. However, the share of FDI in this sector in the total FDI increased from 0.5% to 1%. Although the sector gained competitive power in the course of time, its share in the total export could reach only 1%. However, the share in imports decreased from 1.3% to 0.5%. The effect of lfcc, which refers to the FDI in sector c, on lxcc was negative and statistically significant at 5%. However, the effect of FDI on this sector was not found to be positive and significant. Thus, the FDI inflow played a role in decreasing the export and increasing the import. From the aspect of long-term coefficients, the effect of lfcc on lxcc was found to be negative and statistically significant at 1%. In the graphical analysis on this sector, considering that the competitive power might arise in the recent period and the capacity of attracting foreign capital remained low, it can be seen that the FDI in this sector negatively affected the export.

On the other hand, the sign of lrk cannot be explained from the aspect of the economic theory. Similar to the explanation of ltx, there is an export structure that is independent of the exchange rate and consequently the price. Moreover, lyoecd also has positive and significant effects on lxcc. From the aspect of short-term relationships, the lagged effects of lxcc were negative until 3 lags and positive and significant in the 4th lag. It was also found that lfcc had a positive and significant effect at the 2nd lag. As in the long-term, the national incomes of OECD-member countries affect lxcc positively and statistically significant. hdtt-1 value was found to be negative and statistically significant at 1%. The value -0.3027 suggests that the difference between observed independent values and equilibrium values disappear in 3 quarters. From the aspect of long-term coefficients, the effect of lfcc on lmcc was found to be negative and statistically significant. This finding indicates that the effects of lfcc on lmcc are import-substituting. Thus, it can be stated that the motive of FDI in sector cc was to decrease the export and increase the import and, from this aspect, it can be concluded that there is an import-substituting investment trend. On the other hand, lrk and lytr had statistically significant and positive effects at the levels of 1% and 5%, respectively. It can be seen that the revaluation of national currency and the increase in national income played an import-decreasing role in the cc sector.

The export/import coverage ratio of sector cf (manufacture of coking coal and refined petroleum products) ranged between 30% and 60% and Turkey has no international competitive power. The share of FDI in this sector in the total increased from 3% to 7% in the third quartile of 2008 and the FDI, which decreased down to 2% due to the crisis, couldn't reach its previous level. The share of this sector in the total export ranged between 2% and 6%, whereas its share in total import ranged between 5% and 11%. It can be seen in the figure that Turkey, which always has a foreign trade deficit in sector cf, has a low level of competitive power. Thus, despite the fact that the export opportunities are very limited in this sector and the FDI has a very small share, the effect of lfcf on lxcf is positive in terms of the long-term coefficient and it is statistically significant at 10%. This finding, which is not overlapping with the theoretical expectation, can be most likely explained with the presence of a mechanism, which is based on the exportation of imported petroleum after processing it. On the other hand, the effect of lrk on lxcf is (in parallel with the theoretical expectation) negative and non-significant, whereas lyoecd has a positive and significant effect. In the short-term, no variable other than lyoecd was found to affect. Thus, it was concluded that the FDI inflow into this sector didn't affect the export in the short term. hdtt-1 value was found to be negative and statistically significant at 1%. The value -0.2351 suggests that the difference between observed independent values and equilibrium values disappears in a period of 4 quarters, which is a long period.

In sector cj (manufacture of main metal industry and fabricated metal products), through an upwards trend, the export/import coverage ratio increased from 50% to 250% in 2008. Upon the global crisis, this ratio rapidly decreased to 50% and is currently 100% with an unstable course. The share of FDI of this sector in total is approx. 15%. Thus, as can be understood from the temporal change of fcj/tfc share and xcj/mcj ratios, it can be seen that the FDI may play an important role for the production and foreign trade because of future competitive power and the high share of capital. In sector cj, the effect of lfcj on lxcj in terms of the long-term coefficients is positive and statistically significant at 10%. In parallel with the structure in the diagram, it can be stated that the motive of FDI inflow was to support the export based on the achievability of competitive power in the future. On the other hand, the effect of lrk on lxcj was not in parallel with economic theory but positive and statistically non-significant, whereas the effect of lyoecd was positive and statistically significant at 5%. In the short term, the effect of lfcj on lxcj was found to be negative and statistically non-significant. It can be seen that the FDI inflow into this sector negatively affected the export in the short term. hdtt-1 value was statistically significant at 1% and the value -0.4041 suggests that the difference between observed independent values and equilibrium values disappears in 2.5 quarters.

In sector ck (manufacture of machinery and equipment), FDI is very important for both export and import. In this sector, the export/import coverage ratio increased from 30% to 80% through a fluctuating course. Despite the import is higher than export, the trend supports the export and, thus, it is thought that Turkey would have a foreign competitive power in the future. The share of FDI of this sector in the total increased from 4% to 7% through a fluctuating but upwards trend. The share of ck sector in the total export increased from 4% to 5% with an increasing trend. The share in total import, however, decreased from 12% to 8%. Despite the continuous foreign trade deficit in sector ck, thanks to the

structure of the sector with an increase in export and an upwards trend in FDI, the effect of lfck on lxck in terms of the long-term coefficient was found to be positive and statistically significant at 5%. At this point, given the fact that the FDI makes investment by considering the future, it can be stated that there are export-led foreign capital inflows into this sector. On the other hand, in parallel with the theoretical expectations, the effect of lrk on lxck was found to be negative and statistically non-significant, whereas the effect of lyoecd was found to be positive and statistically non-significant. From the aspect of short-term relationships, it can be seen that, among the variables involved in these analyses, lmck seemed affecting itself until its 4th lag but was not affected by the other 3 independent variables. hdtt-1 value was negative and statistically significant at 1%. The value -0.5457 suggests that the difference between observed independent values and equilibrium values disappears in 2 quarters.

In sector cl (manufacture of computers and electric/electronic and optic devices), the export/import coverage ratio is 50% when excluding the peak in the last quartile of 2018. In this sector, since the export is lower than import, it can be stated that Turkey has no international competitive power. Although slightly fluctuating, the share of this sector in total FDI is approx. 9%. Hence, as can be understood from xcl/mcl ratios and temporal change of fcl/tfc share, considering that cl sector has no competitive power but it has a remarkable share in FDI inflow, it can be stated that the foreign capital focuses on the domestic market and follows an import-substituting motive. The share of this sector in the total export decreased from 12% to 8% through a downwards trend. However, the share in total import ranged between 16% and 10%. From the aspect of long-term coefficients, the effect of lfcl on lmcl was found to be positive and statistically significant. At this point, the FDI in cl sector plays no import-substituting role but an export-led one. Thus, it deepens the import dependency. In other words, it can be stated that it aims to meet the domestic demand and the imported products are injected into the domestic market. On the other hand, lrk and lytr had a positive and statistically significant (1%) effect. From this aspect, it is very interesting that the import has a structure that is very sensitive to income and price. From the aspect of short-term relationships, among the parameters analyzed here, the only lytr was found to have a positive and statistically significant (1%) effect. hdtt-1 value was found to be negative and statistically significant at 1%. The value -0.8258 suggests that the difference between observed independent values and equilibrium values disappears in 1 quarter.

In sector cm (manufacture of transportation vehicles), the export/import coverage ratio was 100%, however, it rapidly decreased in 2010 and, through a fluctuating upwards trend, it reached 180%. The share of this sector in total FDI was found to range between 10% and 20%. Hence, as can be understood from xcm/mcm ratios and temporal change in fcm/tfc share, the besides significant competitive power potential of the cm sector, the capital also has a remarkable share. Thus, it can be stated that the FDI would play an important role in the production and foreign trade. The share of this sector in total export ranged between 12% and 22%, whereas the share in total import ranged between 12% and 16%. From the aspect of long-term coefficients, the effect of lfcm on lmcm was found to be negative and statistically significant at 1%. It suggests that FDI in cm sector in Turkey has an import-substituting motive. This finding is in corroboration with the results reported by Gerni at al. (2014). On the other hand, lrk and lytr were found to have positive and statistically significant (1%) effects. From the aspect of short-term relationships, among the parameters examined here, the 3rd lagged value of lmcm, 6th lagged value of lxcm, 1st lagged value of lrk, and 6th lagged value of lytr were found to have an effect. hdtt-1 value was found to be negative and statistically significant (1%). The value -1.0520 suggests that the difference between observed independent values and equilibrium values disappears immediately.

5. CONCLUSION

With January 24 Decisions, Turkey following liberal policies and implementing export-led strategies since the 1980s followed the policies prioritizing the increase of export revenues as a reflection of Turkey's strategies. From this aspect, even though Turkey implemented certain practices in order to deepen the financial liberalization, it couldn't achieve the desired performance in terms of FDI. However, together with the beginning of negotiations for full membership to the EU, a peak occurred. For the period between 2005 and 2019, as a reflection of foreign trade strategy, FDI is expected to be export-led in the industrial sector and its subsectors. In analyses, it was determined that limited FDI inflow into Turkey had, even partially, export-led motive. Considering the sector, FDI had an export-led motive in 3 subsectors having a significant share in export, namely the manufacture of coking coal and refined petroleum products, manufacture of textile and clothing, and manufacture of main metal

industry and fabricated metal products. Besides that, it was observed that FDI had significant effects in two sectors in terms of both export and import. Among them, it created export-decreasing and import-increasing effects in the manufacture of leather and derivative products, whereas the coefficients positively affecting export and negatively affecting import were found in the manufacture of not-elsewhere-classified machinery and equipment. Hence, the mechanisms bilaterally creating currency loss in leather production and currency gain in machinery and equipment were found. On the other hand, it was determined that there was an import-substituting motive in the manufacture of transportation vehicles, whereas neither export-led nor import-substituting motive but import-deepening motive drew attention in manufacture of computer and electric/electronic and optic products.

Although Turkey couldn't draw sufficient FDI even after 2005, which is the period that Turkey has drawn the highest amount of FDI in its history, when compared to the peer countries, it can be stated that current FDI didn't affirm the growth and employment or balance the foreign currency dependency. Moreover, it can also be emphasized that FDI didn't create high value-added effects at the sector level and had an import-dependent export motive. Especially in import-dependent export motive, the import sensitivity of production and export is at a high level. In sum, it can be stated that FDI is not at the desired depth in the Turkish economy and doesn't create desired effects and that it resulted in public policies not prioritizing the production but yielding rentier economies in the Turkish economy. Turkey implemented liberal policies in terms of production and consumption dimensions since 1980 and couldn't achieve liberalization in public policies. The policies, which supported the interest rent based on public finance until the 2000s and then supported the land rent created by the hands of the government since the 2000s, couldn't create miracle effects on FDI in Turkey when compared to their effects in Asian Tigers.

It can be claimed that, as emphasized by Acemoğlu and Robinson (2020), the problem is not to liberalize the private consumption and production aspects but to liberalize the leviathan/public, which is the real disruptor of liberalism. Thus, it can be stated for the Turkish economy that the presence of public policies nor prioritizing the production and value-added but the public policies based on land rent is the origin of insufficiency in drawing the FDI. Within this scope, considering the fact that the problem in the 1970s was solved with the stabilization program of 1980 and the problem in the 1990s was solved with the stabilization program of 2001, it can be seen that the limit of dilemma that has begun in the 2010s has been most likely reached. The receipts, which create radical transformations in structural transformations once every 20 years, create bundles of problems in the socio-economic structure and the growth remains below its potential. In sum, in a structure where the USD-denominated national income constantly decreased during the last 7 years, it can be emphasized that a radical change in the policies is required and then the functions expected from foreign capital might be achieved.

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