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THE RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT AND TRADE: A CASE STUDY FOR THE TURKISH SERVICE SECTOR

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ABSTRACT. The aim of this study is to analyze the causal link between the inward foreign direct investments (FDI), import service sector, and export service sector over a period of time beginning with 1980 which lasts till 2012 by using the VEC Granger Causality/Block Exogeneity Wald Tests. Our findings showed that there is a bilateral causality between the import services and the inward FDI. However, there is a strong evidence of the unidirectional causality from the export services to the import services, and the inward FDI.
JEL codes: F10; F4; F21

Keywords: foreign direct investment; foreign trade; Turkey

1. Introduction

The developing countries, which are mostly raw material or labor abundant, are in need of capital to promote sustainable economic growth. Short term capital inflows, which are done mostly by portfolio investors, may damage the developing countries' financial stability. That is why, the foreign direct investment (FDI) is a more stable and preferred source of financing the capital deficit. There are many variables that affect the FDI decisions of the multinational firms. This issue is subjected to huge empirical analyses. From the point of view of the multinational firms' differential rate of return, diversification of portfolio, output and market size, market imperfections, liquidity, exchange rate level and volatility, trade openness of both the firms and the country are important factors in the determination of FDI (Agarwal, 1980). If there is an adverse economic environment in the home country,

multinational firms may decide to invest abroad to preserve their competitiveness and export markets. When the multinational firms decide to invest abroad which country they should choose as a host country becomes another important issue. There are three important criteria to attract FDI for the host countries, for instance: the existence of the political stability, the incentives for the foreign investors, and the supply of the cheap factors of production, especially labor.

The multinational firms may make either vertical or horizontal FDI. Vertical FDI is taken, when each production stage has been fragmented internationally into different countries. This is also called international outsourcing or off shoring. Horizontal FDI is taken, when the multinational firm produces same products in multiple countries. They decide to invest abroad for the preservation of the export markets in case of economic fluctuations such as the adverse exchange rate movements and the labor costs. These negative externalities may threaten firms' competitiveness level on the international market (Lipsey, 2004). In this context, the aim of the investor is to be close to consumers' market, which is called Proximity concentration trade–off theory (Brainard, 1993). In general, there are indications that the multinational firms cause not only an increase human capital demand but also a shift towards more intensive capital and skill intensive production function in the host countries. As per Ricardian's classical comparative advantage theory, the most important variable in the determination of the trade pattern among countries is productivity. The higher the relative productivity/wage ratio a country has, the higher the tendency to export towards its trading partners is. FDI inflows give opportunity to the domestic firms to get advantage of the technology and knowledge externalities (Aizenman and Noy, 2006). If the concerned inward FDI is vertical, the multinational firms decrease their production cost and increase their competitiveness level by employing the host countries' low cost factors of production like labor and raw materials. Then the multinational firm exports its product from the host country to the home country to finish their production process. In this context, vertical FDI can be perceived as a complementary variable when the export performance of the country is concerned. On the other hand, the structural developments in the host countries' production process may also attract inward FDI, like institutional arrangements that facilitate the production process or the productivity increments. Therefore, FDI inflows depend on both home and host countries' economic structure of the industries and firms. In other words, there is a bilateral interaction between trade and FDI.

The paper proceeds as follows: Section II summarizes recent empirical studies. Section III describes variables and discusses the empirical findings of the model. Section IV provides concluding remarks.

2. Literature

FDI inflows may cause an increase in the import level of the host country, because the multinational firms may demand import input or intermediate goods for the production stage. If the overwhelming ratio of FDI inflows towards the host country creates import demand, then the current account balance worsens. On the contrary, the current account balance can also be affected positively from the inward FDI. Besides the factors, that facilitate export performance of the host countries, such as the increase in efficiency, human capital, technology, and collaboration externalities, the foreign firm may also produce goods and services in the host country which were being imported before FDI. If there is an increase in the domestic production of the imported goods, then the host country's import level has a tendency to decrease.

There are many studies in literature which investigate the relationship among the variables: inward FDI, export, and import level. The content of the empirical research shows differences. Some studies make investigation with macro level data; others use industry or firm level data. A number of both theoretical and applied papers confirm that there is a positive relationship between inward FDI and export performance of the host country. In other words, inward FDI is a complementary factor for export performance (Lipsey and Weiss; 1984; Clausing, 2000). In addition to that the association between FDI and foreign trade is also supported by greater empirical evidence (Wilkins, 1970; 1974).

A study by Borenstein et al. (1998), covering 69 countries, investigated that "whether inward FDI causes an increase in the economic growth in the host country or not depends on the existing level of the human capital". They found that the human capital increases the ability of learning by doing and widens knowledge and technology spillover. Aizenman and Noy (2006) analyzed gross inward FDI and trade relationship by dividing three subsectors: goods, services, and income. Most statistically significant and positive relationship was found for the goods sector. Compared to the industrialized countries, the strength of the relationship is higher among the developing countries. Blomström (1983) noted that the multinational firms' production pattern in the host countries have a tendency to shift their production pattern from import substitute sectors to export competing sectors which are mainly technology and skill intensive. Aitken et al. (1996) argued, in their study, that when the foreign firms increased their production and export sales in Mexico, the domestic firms also export increased capabilities. Another study for Mexico confirms these results stating that there is a bidirectional positive relationship between inward FDI and export level

(Pacheco-Lopez, 2005). The outcome of the causality test by Liu et al. (2001) indicated that inward FDI promotes the host country exports.

Meerza (2012) reached reverse results for Bangladesh. According to his study, the export performance of the country caused an increase in inward FDI for the period from 1973 till 2008. Another study for Pakistan, covering the period from 1998 till 2009, also confirmed the long run bidirectional causality relationship between inward FDI, growth, and trade (Iqbal et al, 2010).

Fontagne (1999) pointed out that FDI inflows create new jobs, technology, and information externalities for firms in the host countries in a short run. But the effects of FDI inflows on export performance can be seen only in the long run because these externalities spillover slowly. Another study approves that the domestic firms, working with huge multinational firms, get the advantage of positive externalities instantly (Coe and Helpman, 1993).

OECD (1998) report, covering 21 countries for the period from 1980 till 1995, stated that FDI investment stimulates the bilateral trade flows. In addition to that the report, covering 9 countries, found the causality relationship between FDI and trade. Kıran (2011) searched causality relationship for Turkey. But, she could not find the causality relationship between FDI inflows and export performance for the period 1992:01-2008:04.

FDI, a complementary or substitute variable for trade, is a subject for empirical and theoretical debates. We cannot make a generalization covering all the countries. That is the reason for that it should be analyzed case by case for each country and for its sub-sectors. In this context, the aim of this study is to investigate this issue by going deeply into more details. Therefore, we tried to search the causality relationship between the import service sector, export, and FDI inflows. The rest of the sectors will be explored in a further study.

3. Empirical Analysis

3.1. Method and Data Selection

To investigate the relationship between FDI inward and the international trade we use three variables which are: the ratio of the export service sector to GDP (*exp_ngdp)*, the import service sector to GDP (*imp_ngdp)* and the inward FDI to GDP (*ifdi*_ngdp). The data employed for these variables are annual, covering the period from 1980 till 2012, and they are obtained from

the UNCTAD Statistics (UnctadStat). The variables are measured in million Dollars.

3.2. Estimation

Our hypothesis is tested through VAR (Vector Autoregression) estimation technique. Before VAR estimation, it is necessary to control the statistical convenience of all the variables. Firstly, all the variables are measured in logarithms. Secondly, the data that we used in this analysis are annual, so that we did not investigate whether the data included are seasonal or not.

To employ time series models such as VAR, VEC and Granger Causality Tests, all the variables must be stationary. If they are not stationary at a level, we should take their first differences. In this context, the Augmented Dickey- Fuller (ADF) and Phillips- Perron (PP) Unit Root Tests are used in order to determine whether all the variables covered by the model are stationary or not (Shown in Table 1 and Table 2, respectively). According to the results of Table 1, the variable "*lnexp_ngdp,*" "*lnifdi_ngdp,*" and "*lnimp_ngdp,*" are stationary at their first difference *I(I)*.

Table 1 Augmented Dickey-Fuller (ADF) Test Results For Unit Roots

	Level	1st Differences
Series	*Intercept*	*Intercept*
LNEXP_NGDP	*-1.706926 (3)*	*-3.338833 (2)***
LNIMP_NGDP	*-2.775466 (0)*	*-5.864004 (0)****
LNIFDI_NGDP	*-2.418687 (0)*	*-7.592910 (0)****

Notes: (1) ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

(2) The number of lags is shown in parentheses.

According to the results of Table 2, PP test result showed that "*lnexp_ngdp*" variable is stationary at level *I(0);* "*lnimp_ngdp*" and "*lnifdi_ngdp*" variables are stationary at their first difference *I(I)*. That's why, Correlogram and Q statistic tests are also used to get concrete results.

Table 2 Phillips- Perron (PP) Test Results For Unit Roots

	Level	1st Differences
Series	*Intercept*	*Intercept*
lnexp_ngdp	*-5.151480 (4)****	
lnimp_ngdp	*-2.860274 (1)*	*-5.861090(2)****
lnifdi_ngdp	*-2.435090 (3)*	*-14.91353 (21)****

Note: (1) By using Akaike Information Criteria (AIC), ***, ** and *denote significance at the 1%, 5% and 10% levels, respectively.

(2) The number of lags is shown in parentheses.

By using the Correlogram and *Q* statistic tests, we can check whether the variables are stationary or not. By looking at the *Q* test statistics and their corresponding probability values, we can confirm that the variables are not stationary in level. After converting the variables into first differences, we could not reject the null hypothesis. We also checked the graphs to see whether the variables are stationary or not. According to the graphs, all the variables' first differences are stationary. Consequently, all the variables are converted into their first differences.

The domestic and international economic crises had caused structural breaks in Turkey, such as the 1989 Crisis, 1994 Crisis, 2000 Crisis, 2001 Crisis and 2007 Global Economic Crisis. Therefore, the existence of the structural break was investigated by Chow breakpoint test. The corresponding coefficient is significant at 5% level. As a result of this test, we could not reject the null hypothesis (no breaks at specified breakpoints). In other words, there were no structural breaks for the specified period. And also, we employed another Quandt-Andrews unknown breakpoint test, still we could not reject the null hypothesis (no breakpoints within 15% trimmed data), which confirmed our initial result; there is no structural break for these variables for the period from 1980 till 2012.

The unit root test results have shown all the series *I(I)*. Thus, the Johansen Cointegration Test is available for this study. The Johansen cointegration method was examined with the help of VAR models. The existence of a long-run relationship between the variables was tested by using the "Johansen Cointegration Tests". Before estimating the Johansen Cointegration Test, it is necessary to determine the optimal lag length of the variables of the model. By using Akaike Information Criteria (AIC), we can decide the optimal lag length of three variables of the model. The estimation of an equation with a long length of the lag may cause degrees of the freedom *(df)* of the problem.

According to the results of Table 3, we can reject the null hypothesis. In other words, there is a cointegration among these variables. Thereof, we should use the restricted autoregressive model (VECM) to find out the relationship among these variables.

Table 3 Johansen's Cointegration Test Results

Null	Alternative Trace	Alternative Rank	Trace Test Statistic	Rank Test Statistics
r=0	*r≥1*	*r=1*	35.45782	23.47582
r≤1	*r≥2*	*r=2*	11.98200	9.200247
r≤2	*r≥3*	*r=3*	2.781751	2.781751

The inverse roots of AR characteristic polynomials lie within the unit circle indicating that there is no problem in terms of the stability of the three-lag VEC model. Moreover, according to the results of Table 4, the reliability of the model is also confirmed by three diagnostic tests which are the Serial Correlation LM Test, the Jarque-Berra Normality Test and the White Heteroskedasticity Test.

Table 4 VEC Residual Diagnostic Various Tests *(lag=3*)

Diagnostic Tests	*P-Values**
Serial Correlation LM Tests	0.4228
Jarque-Bera Normality Test	0.2156
White Heteroskedasticity Test	0.3129

* Indicates that the corresponding coefficient is significant at 5% level.

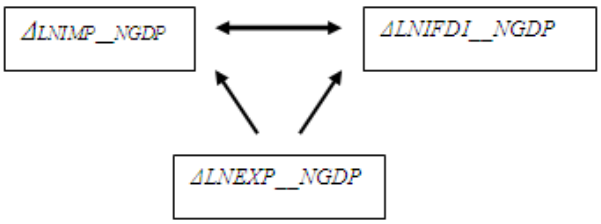
We adopted VEC Granger Causality/Block Exogeneity Wald Test to investigate the long run causal relationship among these variables. In a long-run analysis, the exogeneity test is applied to examine whether the normalization of a cointegrated vector as a dependent variable is acceptable or not. We used the chi-square (Wald) statistics to test the joint significance of the endogenous variables in each equation of the model (Dasgupta, n.d). Following the detection of the cointegration relationship, we continued our analysis by testing the causality for these variables. VEC Granger Causality/Block Exogeneity Wald Test is employed and results are reported in Table 5 (summarized in the causal relationship between the variables: Figure 1).

Table 5 VEC Granger Causality/Block Exogeneity Wald Tests (*lag=3*)

Dependent variable	Excluded	Chi-Square	df	P value *
Δlnifdi__ngdp	*Δlnimp__ngdp*	8.672787	3	0.0340
	Δlnexp__ngdp	13.28386	3	0.0041
	All	14.80609	6	0.0218
Δlnimp__ngdp	*Δlnifdi__ngdp*	13.11886	3	0.0044
	Δlnexp__ngdp	10.73438	3	0.0133
	All	20.29354	6	0.0025
Δlnexp__ngdp	*Δlnifdi__ngdp*	0.364196	3	0.9475
	Δlnimp__ngdp	6.031186	3	0.1101
	All	10.69528	6	0.0983

* Indicates that the corresponding coefficient is significant at 5% level.

Figure 1 The Figure of VEC Granger Causality/Block Exogeneity Wald Tests (*lag=3*)



The test results showed that a bidirectional causality relationship was found between *Δlnimp__ngdp* and *Δlnifdi__ ngdp.* There is a unidirectional causality which runs from the variable *Δlnexp__ngdp* to both *Δlnimp__ngdp* and *Δlnifdi__ ngdp.*

Conclusion

The aim of this paper is to empirically investigate the existence of a long run causal relationship between *Δlnimp__ngdp*, *Δlnifdi__ngdp* and *Δlnexp__ngdp* for a period of time beginning with 1980 till 2012 by using the VEC Granger Causality/Block Exogeneity Wald Tests. According to the test results, an increase in the export service sector level shows that it promotes imports. Since an expansion of the export sector depends on the imported inputs in Turkey, the results of this study justify the structural current account of the deficit problem. And also the results of the study show that an increase in the export service sector level stimulates inward FDI. Whether an increase in the productivity and the human capital attracts FDI inflows or FDI inflows stimulates productivity, knowledge and human capital is discussed in literature like the chicken-egg problem. The result of this study likely supports the idea that an increase in the productivity and competitiveness cause an increase in the export performance of the service sector and, consequently, the multinational firms decide to invest into this sector.

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