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FOREIGN DIRECT INVESTMENT, TRADE OPENNESS AND ECONOMIC GROWTH: A CASE OF TURKEY

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Abstract

In this study, the causality between foreign direct investment, trade openness and economic growth was investigated. The analysis covers 81 observations during the 20 years between 1998Q1-2018Q1 for export, import, FDI and GDP of Turkey. ADF unit root, Engel Granger co-integration, Granger causality, VAR Decomposition, VAR Impulse- Response tests and techniques were employed in the analysis. According to the results, economic growth is explained by GDP at a 75% level, by import at a 15% level, by foreign direct investments at a 5% level and by export at a 5% level. However, the impacts of foreign direct investment and export on economic growth are not statistically significant. GDP and import are statistically significant on economic growth in the first two quarters, but insignificant for subsequent quarters. There is a uni-directional causality from import to economic growth. As a result, import and GDP are the determinants of economic growth in very short-term, while the effects of foreign direct investments and exports on growth are insignificant in Turkey.

Keywords: *Foreign Direct Investment, Trade Openness, Trade Liberalisation, Economic Growth*

DOĞRUDAN YABANCI YATIRIMLAR, TİCARİ SERBESTLEŞME VE İKTİSADİ BÜYÜME: TÜRKİYE ÖRNEĞİ

Öz

Bu çalışmada, doğrudan yabancı yatırımlar, ticari serbestleşme ve iktisadi büyüme arasındaki nedensellik ilişkisi incelenmiştir. Analiz, Türkiye için 1998Q1-2018Q1 arasındaki 20 yıllık dönemde 81 gözlemi kapsamaktadır. Analizde, ADF birim kök, Engel Granger eş-bütünleşme, Granger nedensellik, VAR ayrıştırma ve VAR etki-tepki test ve teknikleri kullanılmıştır. Araştırma sonuçlarına göre; ithalat, ihracat, doğrudan yabancı yatırımlar ve iktisadi büyüme arasında uzun dönemli bir ilişki yoktur. İktisadi büyümenin yaklaşık % 75'i GSYİH tarafından, % 15'i ithalat, % 5'i doğrudan yabancı yatırımlar ve %5'i ise ihracat tarafından açıklanmaktadır. Doğrudan yabancı yatırımların ve ihracatın, büyüme üzerindeki etkisi istatistiksel olarak anlamlı değildir. GSYİH ve ithalat, iktisadi büyüme üzerinde ilk iki çeyrekte istatistiksel olarak anlamlı çıkmasına karşın, sonraki çeyreklerde anlamlılığını yitirmektedir. Sonuç olarak, Türkiye'de ithalat ve GSYİH, iktisadi büyümenin çok kısa dönemde belirleyicisi iken, doğrudan yabancı yatırımlar ve ihracatın büyüme üzerindeki etkileri anlamlı değildir.

Anahtar Kelimeler: *Doğrudan Yabancı Yatırımlar, DYY, Ticari Serbestleşme, Ticari Açıklık, Ticari Liberalizasyon, İktisadi Büyüme.*

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Introduction

Trade liberalisation and foreign direct investment play an essential role in economic growth as a result of globalisation, and therefore it is seen that international trade and FDI are included in the growth models. In the neoclassical growth model, it is argued that in an open economy, capital and labour factors are likely to move among the countries due to cost differences. Hence, liberalisation in international trade, specialisation and comparative advantages ensure the effectiveness of resource allocation, promote competition in national and international markets and spread information and technology among countries (Dawson, 2006). In this context, foreign direct investment helps access to modern management and organisational practices and physical capital (Hofmann, 2013), contributing to the development and diffusion of technology, thereby increasing economic efficiency and economic growth positively. In addition, the argument that trade liberalisation positively affects growth is based on the view that the division of labour and specialisation have significantly improved productivity and export capability (Dutta & Ahmed, 2001). For this reason, many recent studies suggest that trade liberalisation and FDI are important factor account for the growth in developing countries (Estrada & Yap, 2006).

The investigation of Romer (1986) is important because it is accepted as the beginning of endogenous growth models. In Romer's investigations in 1986 and 1990, the technological inventions of the human capital employed for R & D are the driving force of growth. In this regard, it can be said that FDI and trade liberalisation emerged as one of the main arguments of the endogenous growth theory. However, Grossman and Helpmann's investigations in 1989 and 1990 are the pioneers that established a relationship between foreign trade policy and growth based on R&D. Accordingly, the R&D, which benefits from the opportunities brought by foreign trade, will create the driving force of economic growth by bringing comparative advantage to the country's economy. Especially developing economies will be able to access the world knowledge stock through technology transfer by liberating their foreign trade, and over time, with the impact of the development of world trade, they will provide maximum benefits in liberation (Grossman & Helpman, 1989: 1262).

According to this, government policies aiming to increase trade liberalisation, and international competitiveness, promoting innovation and transformation could stimulate long-term economic growth (Belloumi, 2014).

In the endogenous growth model, FDI inflow has a positive diffusion effect on the host countries through capital accumulation, technological progress and management skills transferred from developed countries (Romer, 1986; Lucas, 1988). However, legal infrastructure such as legislation, property rights and trade regime is crucial affecting the impact of FDI on economic growth (Mello, 1999).

Although numerous empirical studies investigating the causality among FDI, trade and growth have been done so far, it is difficult to say that a common consensus is reached because of the method, data set (horizontal section, time series, panel) and problem type (estimation, classification) and differences in selected countries. In the next section, the empirical literature review will be summarised.

1. Literature Review

A wide range of investigations on causality among trade openness, foreign direct investment and economic growth have been conducted so far. A perusal of literature shows that some of the studies focus on the relationship between trade openness and

economic growth, while some others foreign direct investment and economic growth (Table 1).

Table 1: Literature Review

Researcher/s	Data Span Empirical Method	Remarks
Balasubramanyam et al. (1996)	Cross-section data for 46 developing countries, 1970-1985	FDI has a positive impact on economic growth. However, this impact is significantly higher in countries implementing outward-oriented trade policy than the countries implementing inward-oriented trade policy.
Borensztein, et al. (1998)	Cross-country regression framework, 69 countries. 1970-1989	FDI has a positive impact on economic growth. The determinant of this result is the fact that FDI causes to technology. However, this depends on the fact that human capital is above the threshold in the host country.
Zhang and Song (2001)	Co-integration, EC, Granger, 11 East Asia and Latin America, 1980-1998	In the countries implemented outward-oriented foreign trade policy; expanding human capital through the development of education provides economic growth and macroeconomic stability.
Liu and Burridge. (2002)	Co-integration Test, China, Quarterly data.	There is a bi-directional causality among economic growth, FDI and exports. In other words, economic growth, FDI and export reinforce each other. Results support the outward-oriented trade policy.
Ahmed et al. (2003)	Granger, Toda and Yamamoto Tests, Pakistan 1972-2003	Pakistan has benefited from FDI due to "spill-over effect mechanism." The results support the "export-led growth hypothesis."
Makki and Somwaru (2004)	Cross-section data analysis; SUR and TSLS estimates, 66 developing countries 1960-2000	There is a strong positive interaction between FDI and trade in enhancing economic growth. On the other hand, the results revealed that FDI encourages domestic investment. The positive effect of FDI on growth could be higher when FDI has favourable interaction with strong and reliable macroeconomic policy and human capital.
Şen and Karagöz (2005)	Granger Turkey 1994 -2004	The results support the "export-led growth hypothesis" for Turkey; However, FDI has no significant effect on exports and growth.
Chowdhury and Mavrotas (2006)	Toda-Yamamoto, Chile, Malaysia and Thailand, 1969-2000	There is bi-directional causality between economic growth and FDI in the case of Malaysia and Thailand and a unidirectional causality from economic growth to FDI in Chili.
Hansen and Rand (2006)	Granger causal, 31 developing countries, 1975-2004	There is bi-directional causality between economic growth and FDI. The result supports the hypothesis that "FDI effects economic growth positively by spill-over effect mechanism."
Hsiao and Hsiao (2006)	Granger causality, time series and panel data analysis, East and Southeast Asia countries,1986-2004	The results indicate a unidirectional relation from FDI to economic growth. However, FDI effects growth indirectly via exports. There is bi-directional causality between growth and export.

Table 1: Literature Review - Continuation

Researcher/s	Data Span Empirical Method	Remarks
Naveed and Shabbir, (2006)	Fixed effect and control set of variables. Granger Causality, 23 developed countries, 1971-2000	There is strong unidirectional causality from trade openness to economic growth, but FDI does not have an effect on growth.
Yao and Wei (2007)	newly industrialised economies, 1979-2003	FDI has a significant positive impact on economic growth via technology and knowledge causing shift production frontier.
Nath (2008)	Panel data analysis, 13 transition countries, 1991 to 2005	Trade has a significant positive impact on economic growth, but FDI does not have an impact on economic growth.
Katırcıoglu (2009)	ARDL- Granger causality. Turkey 1970-2005	It is concluded a unidirectional causality from growth to FDI in the long-term.
Liu, et al. (2009)	VECM, Panel data analysis, Nine Asian countries, 1970-2002	The results reveal a bidirectional causality between trade and in-flows FDI via merger and acquisitions in most of the countries. There is unidirectional causality from out-flows FDI to economic growth and trade. Trade liberalisation and FDI inflows are the components of the growth in selected Asian countries.
Miankhel et al. (2009)	VECM, Chile, India, Mexico, Malaysia, Pakistan and Thailand, 1970-2005	The long-term results reveal a unidirectional causality from economic growth to FDI in India and from growth to export in Pakistan, from FDI to growth in selected Latin American countries. There is bi-directional causality between economic growth and FDI in Malaysia. It is concluded that the results support the "export-led growth hypothesis."
Jayachandran and Seilan (2010)	Granger, India, 1970-2007	The results indicate a unidirectional causality from FDI and export to economic growth in India.
Iqbal et al. (2010)	VAR, VECM, Pakistan, 1998-2009	FDI and trade are explanatory of economic growth and that there is bidirectional causality between FDI, export and economic growth.
Wijeweera et al. (2010)	Panel data analysis, 45 countries, 1997 to 2004.	Trade openness increases economic growth through productivity gains. FDI inflows have a positive impact on economic growth only in the presence of a highly skilled workforce. Otherwise, FDI does not provide efficiency gains on its own.
Yılmazer (2010)	Granger Causality, Turkey, 1991Q12007Q3	"As a result, direct foreign investment is followed by weak exports and imports, but there is no strong causality between foreign direct investments and economic growth. The study also concluded that there is bi-directional causality between imports, exports and economic and a unidirectional causality from import to export".
Babatunde, (2011)	Panel data analysis forty-two sub-Saharan African countries, 1980 -2003	FDI has a significant positive effect on economic growth. On the other hand, FDI is affected by economic growth and trade openness. The interaction between trade openness and infrastructure leads to a slight increase in FDI inflows.
Klasra, (2011)	ARDL Model, Turkey and Pakistan, 1975-2004	The results indicate a bi-directional causality in short-term between trade openness and export in Pakistan; export and FDI in Turkey. Long-term results support "openness-growth nexus for Pakistan" and "growth-driven exports hypothesis for Turkey".
Acaravcı and Öztürk (2012)	ARDL - Granger Casualty, ten transition European countries, 1994Q1 to 2008Q4	The results show both short-term and long-term casualty between FDI, export and growth in four of the ten countries.
Adegboyega and Odusanya (2014)	ADF-PP, VECM, Nigeria, 1986-2011	The results reveal "a significant positive effect between the degree of trade openness, level of the capital formation while a positive but insignificant relationship between the volume of FDI and gross domestic product growth rate."

Table 1: Literature Review - Continuation

Researcher/s	Data Span Empirical Method	Remarks
Belloumi, (2014)	ARDL, Tunisia, 1970-2008	"There is no significant Granger causality from FDI to economic growth, from economic growth to FDI, from trade to economic growth and from economic growth to trade in the short run. Even though there is a widespread belief that FDI can generate positive spillover externalities for the host country, the empirical results failed to confirm that FDI could generate positive spillover externalities for the host country".
Dritsaki and Stiakakis, (2014)	ARDL, VECM model, Croatia, 1994-2012	Either in short-term and in long-term, FDI does not cause economic growth. However, in both short-term and long-term, there is significant bi-directional causality between economic growth and export.
Nabila and Zakir (2014)	Panel data analysis: 15 selected developing countries. 1978-2012	FDI and trade openness have a significant positive effect on economic growth.
Szkorupová, (2014)	VECM, Slovakia 2001-2010	FDI and export have significant positive casuality on economic growth in long-term.
Fetahi-Vehapi et al., (2015)	Generalized Method of Moments (GMM) estimator on panel datasets, South East European (SEE) countries, 1996-2012	"the positive effects of trade openness on economic growth are conditioned by the initial income per capita and other explanatory variables. Otherwise, there is not robust evidence between these two variables. Moreover, the trade openness is more beneficial to countries with higher level of initial income per capita, as well as trade openness favours countries with higher level of FDI and with higher gross fixed capital formation".
Mahmoodi and Mahmoodi (2016)	Panel- VECM causality: Eight European developing countries 1992-2013 and eight Asian developing countries, 1986-2013.	"Causality results of eight European countries indicated bi-directional causality between economic growth and FDI, and unidirectional causality from economic growth and FDI to exports in the short-term. The empirical results of the Asian countries indicated bi-directional causality between exports and economic growth in the short-term. Moreover, there is evidence of long-run causality from export and FDI to economic growth and long-run causality from economic growth and export to FDI for both of the panels".

When the literature review is examined, it is seen that the economic growth stemmed from foreign direct investments and foreign trade differs from country to country and over time. Some of the studies have emphasised that the impacts of foreign direct investment and trade liberalisation on economic growth have changed depending on the foreign trade regime, the human capital stock and country-specific conditions in the host country. Another remarkable point is that there are significant differences among the studies investigated the direction of the causality among the variables. It is worth to emphasise that the empirical evidence regarding casuality between FDI, trade and economic growth are inadequate to provide a general conclusion.

2. Data Sets, Variables and Modelling

The data set covers 81 observations between 1998Q1-2018Q1 for EXPORT, IMPORT, FDI and GDP of Turkey and was compiled the web base statistical sources of "Central Bank of the Republic of Turkey" and "Turkish Statistical Institute". EXPORT (USD) and IMPORT (USD) variables used as trade openness indicators, while GDP (TL. 2009=100) as an indicator of economic growth. Direct Investment Liability-Net Flows (USD) is used as foreign direct investment (FDI) indicator.

The model in the functional expression of the relations between FDI, trade openness and economic growth is as below.

$$Economic\ Growth = f\ (trade\ openness, foreign\ direct\ investmen) \quad (1)$$

$$GDP\ = f\ (EXPORT, IMPORT, FDI) \quad (2)$$

GDP : Economic growth (TL. fixed price 2009=100),
EXPORT : Export (USD)
IMPORT : Import (USD)
FDI : Foreign Direct Investment (direct investment liability-net flows in USD),

The model for testing the relationship between financial development and economic growth is given as in Equation (3).

$$GDP_{it} = a + \beta_1 EXPORT_{it} + \beta_2 IMPORT_{it} + \beta_3 FDI_{it} + u_{it} \quad (3)$$

where a is the fixed term, and the β coefficients indicate the relationship between the dependent variable and the independent variables, i $(i = 1 \ldots . N)$ shows countries, and u_{it} is the error term. VAR system can be defined as the below equations:

$$dGDP_t = a_{11} + \sum_{i=0}^{n} \beta_{1i} dGDP_{t-i} + \sum_{i=0}^{k} \beta_{2i} dEXPORT_{t-i} + \sum_{i=0}^{l} \beta_{3i} dIMPORT_{t-i} + \sum_{i=0}^{m} \beta_{4i} dFDI_{t-i} + u_{1t-1}$$

$$dIMPORT_t = a_{21} + \sum_{i=0}^{n} \beta_{5i} dGDP_{t-i} + \sum_{i=0}^{k} \beta_{6i} dEXPORT_{t-i} + \sum_{i=0}^{l} \beta_{7i} dIMPORT_{t-i} + \sum_{i=0}^{m} \beta_{8i} dFDI_{t-i} + u_{2t-1}$$

$$dEXPORT_t = a_{31} + \sum_{i=0}^{n} \beta_{9i} dGDP_{t-i} + \sum_{i=0}^{k} \beta_{10i} dEXPORT_{t-i} + \sum_{i=0}^{l} \beta_{11i} dIMPORT_{t-i} + \sum_{i=0}^{m} \beta_{12i} dFDI_{t-i} + u_{3t-1}$$

$$dFDI_t = a_{41} + \sum_{i=0}^{n} \beta_{13i} dGDP_{t-i} + \sum_{i=0}^{k} \beta_{14i} dEXPORT_{t-i} + \sum_{i=0}^{l} \beta_{15i} dIMPORT_{t-i} + \sum_{i=0}^{m} \beta_{16i} dFDI_{t-i} + u_{4t-1}$$

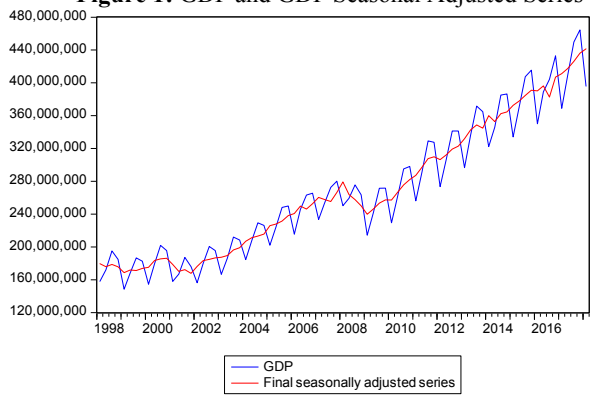
Where, d symbolise the first difference, u_1, u_2 and u_3 represnts error correction terms. k, l and m are the number of lag-lengths.

3. Methodology and Findings

Under this headline, it is investigated whether trade openness and foreign direct investment are the determinants of economic growth. For this purpose, primarily the seasonal variables will be seasonally adjusted. Then, the stationary of the series will be analysed with the help of "Augmented Dickey-Fuller (ADF) Test". Before carrying on further, the non-stationary series in the level will be converted to stationary in differences. Because the non-stationary time series are not suitable for the estimation. "Lag Selection Criteria" based on "Akaike Information Criterion" will be defined. Engle-Granger Co-integration test will be employed to see if the series are co-integrated or have long-term relations. After that "Granger causality test" will be conducted to define the "causal relationship between the variables". Afterwards VAR decomposition, impulse-response tests will be conducted to understand which independent variables are capable of explaining the variableness of the dependent variable over time.

Quarterly observed time series frequently show regular repeated rhythmic (seasonal) path. Seasonality in the variables causes to distort the results of the tests. Seasonal adjustment helps to separate this seasonal pattern to derive a trend of the series. GDP is the only series that shows seasonal movement. Therefore it was seasonally adjusted as in Figure 1 below.

Figure 1: GDP and GDP Seasonal Adjusted Series



Stationary of the series is crucial regarding the correctness of the test results. With the help of the "Augmented Dickey-Fuller (ADF)", each of series was tested whether there is a unit root. "The relevant selected variable has unit root" the null hypothesis is tested against "relevant variable has no unit root" the alternative hypothesis.

Table 2: Augmented Dickey-Fuller Unit Root Test

	Level				First Difference			
	Intercept		Trend&Intercept		Intercept		Trend&Intercept	
	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
GDP	2.091541	0.9999	-1.712129	0.7369	-8.988216	0.0000*	-9.651856	0.0000*
FDI	-2.381848	0.1501	-2.643804	0.2627	-9.772225	0.0000*	-9.749451	0.0000*
EXPORT	-0.632551	0.8563	-2.109963	0.5319	-6.193056	0.0000*	-6.149772	0.0000*
IMPORT	-0.987343	0.7540	-3.161982	0.1252	-4.464240	0.0005*	-4.442792	0.0035*

Note: * show that coefficients are statistically significant at the 1% level of significance.

According to the result of the ADF test at the level, the null hypothesis was rejected due to the probabilities of the intercept and intercept & trend of the all variables are higher than 0.05. That means all the series are non-stationary. Therefore, the series were re-tested at first difference level. The results revealed that all series have no unit root, so are stationary. Hereafter, The Engel Granger co-integration test will be performed to assess whether there is a long-term relationship between the variables.

Table 3: Engle-Granger Co-integration

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI)	750.3217	415.6163	1.805323	0.0750
D(EXPORT)	0.807822	0.495490	1.630349	0.1072
D(IMPORT)	0.124157	0.247991	0.500652	0.6181
C	2827499.	702769.5	4.023366	0.0001*

Note: * show that coefficient is statistically significant at the 1% level of significance

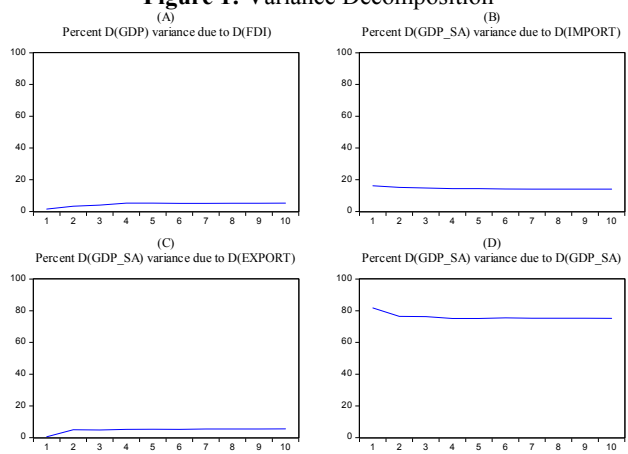
The Engel Granger co-integration test was performed to assess whether there is a long-term relationship between the variables. According to the test results, there was no co-integration, that is, no long-term relationship between variables in the model. For this reason, "Variance Decomposition" and "Impulse-Response" techniques based on VAR model will be employed to analyse short-term relation. The results of the VAR decomposition causality are summarised in Table 4 below.

Table 4: VAR Decomposition of GDP

Period	S.E.	D(FDI)	D(IMPORT)	D(EXPORT)	D(GDP)
1	1375.701	1.481833	16.19608	0.524127	81.79796
2	1744.370	3.381463	15.20804	4.985107	76.42539
3	1777.262	4.029424	14.79792	4.849868	76.32279
4	1795.205	5.259029	14.37323	5.216901	75.15084
5	1843.845	5.259610	14.35443	5.284728	75.10123
6	1891.863	5.155598	14.14256	5.180474	75.52136
7	1913.887	5.161794	14.05943	5.451120	75.32765
8	1916.526	5.228736	14.04415	5.445071	75.28204
9	1922.775	5.227346	14.06343	5.445258	75.26397
10	1931.222	5.244034	14.05635	5.494763	75.20485

Cholesky Ordering: D(FDI) D(IMPORT) D(EXPORT) D(GDP_SA)

Figure 1: Variance Decomposition



The VAR decomposition shows the ratio between the variations of one variable due to its own shocks and the changes due to shocks of the other variables (Sevüktekin & Çınar: 515). Therefore, it helps to assess how a shock rebound throughout the system or affect each of the variables and helps to understand which independent variable describes better the variability in the dependent variable over time. It can be examined the relative effect of GDP, EXPORT, IMPORT and FDI by employing VAR decomposition technique.

According to the variance decomposition results shown in Table 3 and Figure 1, economic growth is explained by itself at a 75% level. Import expounds economic growth at 15% level, while exports and direct investments are at 5% level.

Hereafter Impulse-Response technique will be implemented to understand whether the independent variables significant to explain the casuality. The Impulse-Response Function is a technique that is used to measure the response of endogenous variables in the VAR model to random shocks applied on error terms. It is crucial here that the series must be stationary. If the series is stationary, the effect of the shocks to the system will disappear after a particular time. Otherwise, it will be forever (Sevüktekin & Çınar:510). The series in this study are stationary at first difference.

Figure 2: Response to Cholesky One S.D. Innovation ± 2 S.E.

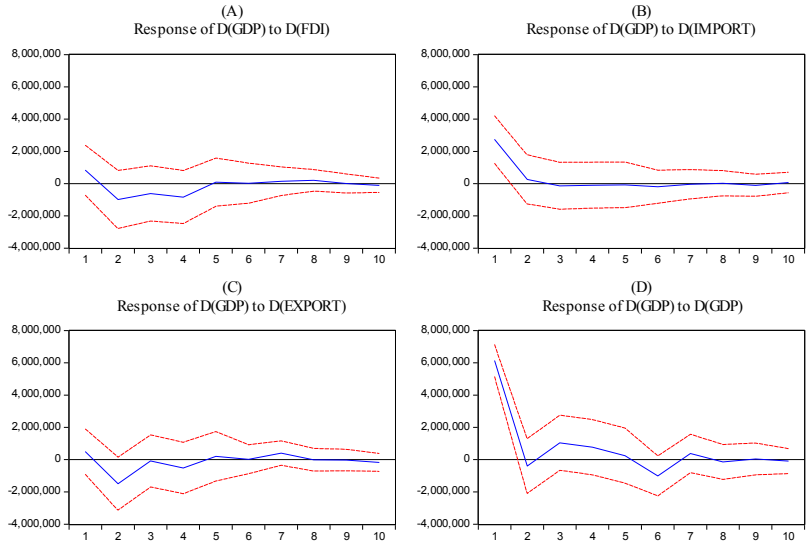


Figure 2 shows the Impulse-Response Functions derived from the VAR model. Graphs show the direction and magnitude of the response of GDP to one standard deviation shock applied on error terms of GDP, EXPORT, IMPORT for the next ten periods. The dashed lines in the graphs show ± 2 standard error confidence intervals for the response of the variables to determine if the results are statistically significant. If both of the dashed lines are above or below the zero line, it means statistically significant. If the dashed lines, even one of two, intersects the zero line or one of two is above, while another one below of zero line, it means statistically insignificant.

Figure-2A depicts the impulse-response of GDP to FDI that means how economic growth reacted when a standard deviation shock applied to foreign direct investment. As it is seen in the graph 2A, after a standard deviation shock on FDI, GDP respond positively until the end of the first quarter that means a change in FDI creates a positive impact on economic growth in first quarter. Afterwards, it turns to negative until the end of the fourth quarter. It implies that a change in FDI affects economic growth negatively along with three quarters between the first and fourth periods. Then it keeps going positive

between fifth and ninth quarter before turn it again to negative. Graph 2A also indicates that one of the dashed lines belongs to the standard deviation of FDI is above the zero line, while the other one is below. It interprets that the response of GDP to FDI is statistically insignificant.

Figure-2B demonstrates the impulse-response of GDP to IMPORT that means how economic growth responded when a standard deviation shock applied on import. After a standard deviation shock on IMPORT, GDP responds positively until the end of the second quarter that means a change in import creates a positive impact on economic growth in the first two quarters. Afterwards, it turns to negative until the end of the seventh quarter. It implies that a change in import affects economic growth negatively along with five quarters between second and seventh periods before disappeared after seventh period. On the other hand, dashed lines belong to the standard deviation of IMPORT is above of the zero line in two quarters, but hereafter, one remains above the zero line until the end of the tenth quarter, while the other remains below. This result shows that GDP response to IMPORT is statistically significant for the first two quarters, but it is statistically insignificant for subsequent quarters.

Figure-2C indicates the impulse-response of GDP to EXPORT that means how economic growth responds when a standard deviation shock applied on export. After a standard deviation shock on export, the response of GDP turns to negative in the first quarter until the beginning of the fifth quarter. It can be interpreted that a change in export loses its positive impact on economic growth very soon and affects negatively until the fifth period. Between fifth and ninth periods, the response of GDP turns to positive again that means a change in export affects economic growth positively during five quarters between fifth and ninth periods before disappear. On top of this result, one of the dashed lines belongs to the standard deviation of EXPORT is above the zero line, while the other one is below. It means the response of economic growth to export is statistically insignificant.

Figure-2D depicts the impulse-response of GDP to GDP that means how economic growth responded when a standard deviation shock applied on GDP. After a standard deviation shock on GDP, GDP responds positively until the end of the second quarter that means a change in economic growth creates a positive impact on economic growth in the first two quarters. Afterwards, it turns to negative until the fifth quarter. It implies that a change in economic growth affects economic growth negatively along with three quarters between second and fifth periods. Between fifth and seventh quarters, it turns positive that means a change in GDP affects GDP positively between fifth and seventh quarters before disappear. Additionally dashed lines belong to the standard deviation of GDP is above of the zero line in the course of two quarters, but hereafter, one remains above until the end of the tenth quarter, while the other remains below. These results show that GDP response to GDP is statistically significant for two quarters, but it is statistically insignificant for subsequent quarters.

Table 5: VAR Granger Causality/ Wald Tests

Dependent variable: D(GDP)			Dependent variable: D(FDI)		
Excluded	**Chi-sq**	**Prob.**	**Excluded**	**Chi-sq**	**Prob.**
D(FDI)	2.112620	0.7151	D(IMPORT)	8.405322	0.0778
D(IMPORT)	4.336752	0.3623	D(EXPORT)	6.873131	0.1427
D(EXPORT)	4.688057	0.3208	D(GDP)	1.148956	0.8864
All	9.522470	0.6578	All	14.54609	0.2672
Dependent variable: D(IMPORT)			**Dependent variable: D(EXPORT)**		
Excluded	**Chi-sq**	**Prob.**	**Excluded**	**Chi-sq**	**Prob.**
D(FDI)	1.377817	0.8480	D(FDI)	1.801379	0.7722
D(EXPORT)	8.995193	0.0612	D(IMPORT)	8.212302	0.0841
D(GDP)	19.72308	0.0006*	D(GDP)	3.829981	0.4295
All	36.97218	0.0002*	All	15.12020	0.2349

Note: * statistically significant at the 5% level of significance. 81 observations between 1998Q1-2018Q1.

Table 5 shows the VAR Granger Casualty- Block Exogenity Wald test results. Here, a regression model for each variable is established, and the relationship between the dependent and independent variables is analysed. Accordingly, for each case, the basic hypothesis (H_0), the independent variable is not an explanatory variable of the dependent variable, was tested against the alternative hypothesis (H_A), the independent variable is an explanatory variable of the dependent variable. The results are summarised as below:

1. Import, export and foreign direct investment are note Granger cause of economic growth.
2. Economic growth, import and export are not Granger cause of foreign direct investment.
3. Economic growth is the Granger cause of Import, but export and foreign direct investment are not the Granger cause of economic growth.
4. Import, export and foreign direct investment are not the Granger cause of economic growth.
5. Therefore, there is a unidirectional casuality from import to economic growth.

Conclusion

In this study, the relationship between foreign direct investment, trade openness and economic growth in Turkey was examined by using quarterly data for the period of 1998Q1-2018Q1. The indicator of foreign direct investment is Direct Investment Liability-Net Flows in USD. The indicators of trade openness are export in USD and import in USD. Economic growth is GDP in TL (2009=100).

Primarily, series showing a seasonal pattern was seasonally adjusted to prevent distortion of the results of the subsequent tests. Stationary of the series were examined with the help of the "Augmented Dickey-Fuller (ADF)" test. It is detected that all the series contain unit root and so are non-stationary. For that reason, by calculating first-order differences, series were converted to stationary. The existence of a long-term relationship between the variables was tested by Engel Granger co-integration test and results revealed that there is not a long-term relationship between variables in the model.

For this reason, "Variance Decomposition" and "Impulse-Response" techniques based on VAR model implemented to analyse the short-term causality. According to the VAR decomposition results, economic growth is explained by GDP at a 75% level, by import at a 15% level, by foreign direct investments at a 5% level and by export at a 5% level. The results of the Impulse-Response Functions derived from the VAR model revealed that relationship between foreign direct investment, export and economic growth

statistically insignificant, while the relationship between import, GDP and economic growth are statistically significant for two quarters, but are insignificant for subsequent quarters. In other words, economic growth arises from import and economic growth itself. The results of VAR Granger Casualty- Block Exogenity Wald showed that; Import, export and foreign direct investment are not Granger cause of economic growth. Economic growth, import and export are not Granger cause of foreign direct investment. Economic growth is the Granger cause of Import, but export and foreign direct investment are not the Granger cause of economic growth. Import, export and foreign direct investment are not the Granger cause of economic growth. Therefore, it is concluded that there is a uni-directional casuality from import to economic growth. As a result, import and GDP are the determinants of economic growth in very short-term, while the effects of foreign direct investments and exports on growth are insignificant in Turkey.

Insignificant impact of foreign direct investment on economic growth would be attributed to the relatively low level of foreign direct investment in Turkey. In case of a significant increase in foreign direct investment, the effect of the foreign direct investment on economic growth can be re-investigated by simulation technique in future studies.

An increase in production and therefore export is only possible with the increase in imports. Import-dependent economic growth is the primary cause of the currency crisis in Turkey. In case of taking measures to ensure the shifting the production of imported materials to Turkey, import-dependent growth and therefore the currency crisis risk will decrease and growth rate, employment and potential GDP level will increase.

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