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Research Article

The Impact of Foreign Direct Investments on Economic Growth and International Trade: The Example of E7 Countries

Doğrudan Yabancı Yatırımların Ekonomik Büyüme ve Uluslararası Ticaret Üzerindeki Etkisi: E7 Ülkeleri Örneği

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Abstract

In recent years, empirical studies investigating the relationship between foreign direct investment and its effects on international trade and economic growth have become increasingly popular. Foreign direct investments and international trade are at the heart of ensuring continuous economic growth. Hence, this study emphasizes further investigation of the relationship between FDI, economic growth, and international trade. For this study, E7 (Turkey, Mexico, Indonesia, China, Brazil, Russia, India) countries have been taken into consideration. The research was undertaken using a panel data analysis from the 1992-2022 dataset. The results of the study reveal that FDI economic growth and international trade cointegrate. The AMG estimation applied in this study indicates that it is a significant and positive import-foreign direct investment relationship among all other international trade indicators. Nevertheless, the results show that FDI inflows result in diversification in export structures which creates resiliency for the economy in E7 countries. It was also found that where trade openness is very large in a country, then FDI would be affine, further increasing the potential for economic growth. The analysis indicates that policy reforms that improve conditions for investment and introduce trade liberalization would be effective in supporting such positive effects. These show what E7 will do economically sustainable in the long term-devise strategies to strengthen the FDI-intraconnect trade link.

Keywords: *International Trade, Economic Growth, Foreign Direct Investment, Panel Data, E7 Countries*

Öz

Son yıllarda, doğrudan yabancı yatırımlar ile uluslararası ticaret ve ekonomik büyüme üzerindeki etkileri arasındaki ilişkiyi araştıran ampirik çalışmalar giderek daha popüler hale gelmiştir. Doğrudan yabancı yatırımlar ve uluslararası ticaret, sürekli ekonomik büyümenin sağlanmasının merkezinde yer almaktadır. Bu nedenle, bu çalışma doğrudan yabancı

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yatırımlar, ekonomik büyüme ve uluslararası ticaret arasındaki ilişkinin daha fazla araştırılmasına vurgu yapmaktadır. Bu çalışma için E7 (Türkiye, Meksika, Endonezya, Çin, Brezilya, Rusya, Hindistan) ülkeleri dikkate alınmıştır. Araştırma, 1992-2022 veri setinden elde edilen panel veri analizi kullanılarak gerçekleştirilmiştir. Çalışmanın sonuçları, DYY ekonomik büyümesi ile uluslararası ticaretin eşbütünleşik olduğunu ortaya koymaktadır. Bu çalışmada uygulanan AMG tahmini, diğer tüm uluslararası ticaret göstergeleri arasında anlamlı ve pozitif bir doğrudan yabancı yatırım-ithalat ilişkisi olduğunu göstermektedir. Bununla birlikte, sonuçlar DYY girişlerinin ihracat yapılarında çeşitlenmeye yol açtığını ve bunun da E7 ülkelerinde ekonomi için esneklik yarattığını göstermektedir. Ayrıca, bir ülkede ticari açıklığın çok büyük olduğu durumlarda, DYY'nin ekonomik büyüme potansiyelini daha da artıracak şekilde yakınsayacağı bulunmuştur. Analiz, yatırım koşullarını iyileştiren ve ticaretin serbestleştirilmesini sağlayan politika reformlarının bu tür olumlu etkileri desteklemede etkili olacağını göstermektedir. Sonuç olarak, DYY-iç ticaret bağlantısını güçlendirmek için stratejiler geliştirmek E7'nin uzun vadede ekonomik olarak sürdürülebilirliğini sağlamak açısından önemlidir.

Anahtar Kelimeler: *Uluslararası Ticaret, Ekonomik Büyüme, Doğrudan Yabancı Yatırımlar, Panel Veri, E7 Ülkeleri*

1. Introduction

FDI is understood to be very complex and multifaceted as it relates to different management practices, including portfolio investments into equities abroad and bonds. It is generally seen as a major economic growth catalyser and perhaps the anchor of global financialisation. Foreign capital, advanced technology, and special managerial expertise are very decisive against the economic development paths given the developing and transitioning economies through FDI (Alfarro, 2017; Wang, 2022). Indeed FDI is also a very important source of internal funding for many developing countries and aids the formation of capital and economic restructuring (Omisakin, 2009; Nketiah, 2020). In fact, among others, it is the one most regarded as the most stable and persistent inflow of foreign capital. Thus, it is an important means for stimulating technology transfer, developing human capital, and enabling business climate competition (Hobbs et al., 2021). Therefore, these dynamics work together to provide economic growth, help in poverty alleviation, and uplift welfare standards.

The linkage between economic growth and international trade has always been treated as a primary subject of study in economic theory and policy. Several historical perspectives such as mercantilism, which insisted on maintaining a favorable trade balance by exporting and importing for the greater part, thus hoping to achieve national welfare and economic development, were debated among classical economists like Adam Smith and David Ricardo. The authors of theories claim that countries can attain greater riches by exporting goods on which they have a cost advantage and obtaining those whose production costs are higher (Abendin & Duan, 2021). Groundwork theories remain critical as they maintain part of the argument for trade as a critical determinant of economic growth. Through modern growth theories, one can comprehend how the FDI influences the economy. Apart from investment, the neoclassical growth theory holds that FDI would result in better economic expansion compared with increased quantity and efficiency of investments. It points out the importance of this capital accumulation in bringing about increased productivity and thus sustained growth over the long term (Yılmazer, 2010). On the other hand, the endogenous growth model supports a strong qualitative dimension in growth by transfers through technology, innovations, and improvement of human capital in order to make possible for economic development over the years through diffusion of knowledge reinforcement of competitive edges (Kahveci & Terzi, 2017). With this fusion of theoretical perspectives, this study intends to test the relationship of FDI with economic progress and trade concerning each other in the E7 member countries. The study contains investigations on FDI as the dependent variable, along with the influence of its independent variables; namely, exports, imports and economic growth. While extensive literature explores FDI and its economic implications, very few detailed investigations have been undertaken into specific trade components. This research attempts to fill the gap using a panel data analysis for different E7 countries in revealing the dynamic interdependencies between these variables.

This is indeed a very vital concern since FDI is a big factor that determines the economic future of any developing economy. E7 would be the most important consideration of this study with high growth regimes and very high contribution toward the global economy. It is critical to understand how FDI interacts through trade and growth so that policymakers can come up with practical strategies that would improve their countries' performance in developing economics and integration into international markets in this area. In addition, these findings would be helpful in attracting foreign direct investment (FDI), enhancing competitiveness in trade, and promoting sustainable economic development.

The hypotheses, which will direct the analysis, have been formulated as follows:

H1: FDI relates positively to economic growth within E7 countries.

H2: An Increase in FDI increases E7 countries' exports.

H3: The effects of FDI on imports are statistically significant although much weaker than on exports.

The construction of exports and imports as explanatory variables derives from the impact that trade has in capturing the process in more complex ways. It represents the flow of goods and services taken in and able to work against FDI patterns, linking them to competitive economic output flows. In keeping with FDI's major outcome variable regarding its implications for national welfare and development, growth has been included. Together, they involve a complete package of considerations with regard to what can be understood about the multifaceted influences of this dimension of foreign investment.

Thus, the study aims at enriching the literature about the different dimensions that relate to FDI, economic development, and trade in E7 countries. The study vicariously plugs in the theoretical and empirical gaps and, hence, gives relevant results to academics, policymakers, and other stakeholders dealing with international trade and investment. The findings of this study are expected to build an understanding of how different dimensions of FDI proceed and their meaning for sustainable economic growth in developing economies.

2. Literature Review

Foreign direct investment is well researched in terms of its relationship with economic growth, and many studies highlighted the significance of foreign direct investment inflows in promoting growth through important channels such as capital formation, technology dissemination, and improvement in trade. The literature study below shows a comprehensive examination of the relationship between foreign direct investment (FDI) and economic growth, with a focus on several avenues via which FDI contributes to growth, such as capital formation, knowledge transfer, and trade enhancement. The findings are diverse and contextualized, emphasizing regional heterogeneity, temporal dynamics, and the importance of policy frameworks. In different parts of the world, for instance, Nguyen (2020) analyzed FDI and trade for Vietnam, observing that FDI has positive effects on economic growth because it enhances exports, while import effects were found not to be significant statistically. Likewise, Ayanev (2022) added geographical value by studying sub-Saharan Africa. He found long-term positive relations between the growth and dyads of FDI, but short-term impacts were trivial. Such findings accentuate the temporal dimensions in understanding the effects of FDI. In the Mena region, Ebghaei (2023) pointed to specific country differences regarding the relationship between FDI and growth because of differences in institutional base and levels of economic development. Some other papers, such as Kotil (2020) and Sey (2024), also contradicted the conventional notion that the effect FDI bears on trade and growth depends significantly on local economic models and policy contexts. Şahin (2021) used panel data analysis to investigate the possibility of a causal relationship and long-term cointegration between trade openness and economic growth in several nations, including Turkey. The Panel Granger causality tests' results supported the idea that trade openness and capital inflows are essential for sustained economic growth by confirming that foreign direct investment (FDI) and international trade are key drivers of economic growth.

Acaravcı and Akyol (2017) looked into the connection between economic growth, foreign commerce, and foreign direct investments. The study concluded that there is a unidirectional causal relationship between imports and FDI to growth in Turkey based on the results of the time series analysis used in the investigation. Purnama and Yao (2019) used the Pedroni panel co-integration test to investigate the long-term link between economic growth in Asian countries and international commerce. The study concluded that FDI and, by extension, international commerce are essential components that sustain economic growth over the long term. This research highlights how crucial it is to support international trade policies to maintain growth, especially in light of Asia's quickly emerging economies, where trade liberalisation can act as a stimulant to maintain economic vitality.

Güzel and Tünsoy (2023) looked at the causation and long-run cointegration between FDI dyads and exports and imports in Turkey and the BRICS nations. According to the study, FDI dyads positively and statistically significantly affect imports and exports, indicating that FDI is a crucial component of the trade-growth relationship. This data lends credence to the theory that foreign direct investment (FDI) not only promotes trade but also strengthens nations' overall economic integration into the world economy.

Ekinci (2011) looked into how employment in Turkey was affected by economic growth and foreign direct investment. The results of the Granger causality test, which was used in the investigation, showed that there was a bidirectional causal relationship between FDI and economic growth.

Sezer (2018) used panel data analysis to examine the intricate linkages between foreign direct investment (FDI), foreign trade, and economic growth in Turkey and the BRICS nations. The analysis discovered a

unidirectional causal relationship between FDI and imports, but a reciprocal causal relationship between exports and FDI inflows. This highlights the asymmetric nature of these interactions by showing that while FDI can increase both exports and imports, the effect on imports does not always feed back into FDI.

To improve our understanding of how FDI dyads affect Turkey's economic growth, Taşdemir and Erdaş (2018) used variance decomposition and impulse-response analysis techniques. Reiterating the idea that FDI is essential to Turkey's economic development, the results validated the concept that FDI dyads are a major driver of economic growth. This study adds to the current conversation about the strategic role that foreign direct investment (FDI) plays in maintaining long-term economic growth in developing nations.

Ersin and Tufaner (2018) used time series analysis to investigate the link between foreign trade and foreign direct investment (FDI) in Turkey. They found that the two variables are positively correlated. The study underlined how FDI is drawn to overseas trade, which in turn encourages more trade, having a compounding effect on economic growth. This finding emphasises how trade and foreign direct investment (FDI) support one another and work together to propel economic growth.

Finally, using cointegration analysis, Sevinç and Şeker (2023) examined the trilateral link between foreign direct investment (FDI), investment incentives, and trade in Turkey. According to the study, there is a high correlation between these three factors due to investment incentives, and each one eventually affects the others. This research emphasises how crucial it is to approach economic policy holistically, coordinating trade laws, investment incentives, and FDI attraction tactics to promote long-term, sustainable economic growth.

3. Methodology

The present study aims at a comprehensive analysis of the FDI-growth nexus in E-7 countries (Brazil, Indonesia, Russia, Mexico, Turkey, China, and India) through panel data analysis for the period 1992-2022. It aims at widening the scope of the geographical focus, apart from bringing out certain specificities regarding the FDI-growth nexus in such a heterogeneous emerging market group. Further, imports and exports have been treated as trade indicators rather than international trade as a whole.

One of the striking differences with other minor/unusual studies is that the former normally concentrates on short-term dynamics/and or investigates just one country, whereas this one investigates long-term trends and recommends policy-relevant conclusions for the E-7 economies collectively. Systematic and comparative methodology is adopted in this study, which uses advanced panel data techniques to address research biases and heterogeneity across countries. The variables based on the study are presented in table 1.

Table 1: Variables Used in the Study

Variable	Definition	Period	Country	Method
Exports	Exports of goods and services (% of GDP)	1992-2022	E-7	Panel Data Analysis
Economic growth	GDP per capita growth (annual %)	1992-2022	E-7	Panel Data Analysis
DYY	Foreign Direct Investment, net inflows (% of GDP)	1992-2022	E-7	Panel Data Analysis
Imports	Imports of goods and services (% of GDP)	1992-2022	E-7	Panel Data Analysis

Economic growth, imports, and exports are the independent variables in this analysis, whereas foreign direct investment (FDI) is the dependent variable. The study's extensive dataset, which spans three decades, guarantees reliable results that consider geographic and temporal variances. This study adds to the body of literature by offering a thorough analysis of the relationship between FDI, growth, and trade within the context of the E-7 framework. It is unique in that it combines a number of factors with sophisticated methodological techniques to provide policymakers in emerging economies with useful insights. Building on this work, future studies could examine how FDI affects particular sectors and how institutional quality mediates these correlations.

3.1. Model

The econometric model applied in the study is shown in equation 1 and equation 2:

FDI = f (EXP, IMP, EG) (1)

Based on Equation (1), the model can be written as the following equation.

$$FDI_{it} = \beta_0 + \beta_1 EXP_{it} + \beta_2 IMP_{it} + \beta_3 EG_{it} + u_{it} \quad (2)$$

In the model in Equation (2), the FDI dependent variable, which occurs independently of the explanatory variables, is defined as foreign direct investments and its coefficient β_0 is defined as a constant. β_1 β_2 β_3 and β_4 parameters to be estimated; FDI dependent variable, import, export and economic growth independent variables, respectively. The term u in the model represents the error and is assumed to have zero mean, constant variance and normal distribution. STATA econometric package programme is used in the estimation of the coefficients.

Table 2: Statistical Information of Variables

Variables	Sample	Prob.	Stnd.Dev.	Min.	Max.
FDI	217	2.049777	1.37934	-2.75744	6.186882
EXP	217	22.38613	7.548059	8.385063	48.2546
IMP	217	23.55905	8.80935	6.73021	62.32246
EG	217	3.239457	4.565278	-14.61392	13.63582

The dataset comprises 217 observations and gives descriptive statistics for four variables, namely: Foreign Direct Investment (FDI), Exports (EXP), Imports (IMP) and Balance of Trade (EG). Below is a general interpretation of summary statistics.

Foreign Direct Investment (FDI): On average, FDI scores were 2.05, with a higher standard deviation of 1.38 reflecting moderate deviation in the data. The data range showed a minimum of 2.76 indicating cases of disinvestment as well as less negative inflows, with a maximum of 6.19 denoting positive inflows above average.

Exports (EXP): Exports average 22.39 with a standard deviation of 7.55 indicating variation in the observations. With minimum and maximum values at 8.39 and 48.25 respectively, significant divergences in export performance exist among sample entities.

Imports (IMP): Imports have an average value of 23.56, slightly above that for exports while it has a larger standard deviation, namely 8.81. The import activities in this dataset vary from 6.73 to 62.32.

Balance of Trade (EG): Mean: 3.24; standard deviation: 4.57- it has the highest variability among variables. The values of BY range from 14.61 to 13.64; the former indicates a severe trade deficit in some cases while the latter indicates a trade surplus.

Therefore, the fluctuation of FDI shows that foreign investment can be appealing to varying degrees or are accessible in different countries. Disparities that arise in values exported and those imported reveal respective specific trade imbalances or economic conditions in countries. The Balance of Trade (EG) variable shows that trade balances are dynamic, often exhibiting quite appreciated deficits as well as surpluses. Such statistics indicate a possible avenue for exploring relationships between variables, including the role played by FDI in influencing trade dynamics or the interaction of imports, exports, and trade balances.

Table 3: Cross-Section Dependence Test

FDI	***Statistics***	***Prob.***	***Eco.Growth***	***Statistics***	***Prob.***
Breusch-Pagan LM	39,79**	0.0079	Breusch-Pagan LM	46.97***	0.0009
Bias-corrected scaled LM	7.982***	0.0000	Bias-corrected scaled LM	11.15 ***	0.0000

Pesaran CD	1.603	0.1090	Pesaran CD	4.911***	0.0000
EXP	***Statistics***	***Prob.***	***IMP***	***Statistics***	***Prob.***
Breusch-Pagan LM	28.94	0.1154	Breusch-Pagan LM	46.9***	0.0010
Bias-corrected scaled LM	3.074**	0.0021	Bias-corrected scaled LM	11.15***	0.0010
Pesaran CD	-.1838	0.8542	Pesaran CD	.8503	0.3951

Features of the Dataset and Test Applicability Information N and T characteristics: The number of cross-sections (N) and periods (T) in the dataset, which are crucial for assessing the suitability of the tests used, are not specified in the paper. In general, tests such as the Breusch-Pagan LM test are appropriate when T (periods) is significantly bigger than N (cross-sections). On the other hand, because of its resilience in high-dimensional panel data, the Pesaran CD test is more appropriate if N is big. Because it corrects for size distortions in the standard LM test, the bias-corrected scaled LM test is frequently chosen when N and T are balanced.

Cross-sectional Dependency Tests Are Necessary: In panel data analysis, cross-sectional dependence tests are essential for determining if the residuals from various cross-sectional units (such as nations or businesses) are associated. Ignoring cross-sectional dependence can result in inconsistent and biased estimators, which can mislead how results should be interpreted.

1. The Breusch-Pagan LM Test assesses the null hypothesis that there is no cross-sectional dependence. It determines the total of squared residual correlations across cross-sections:

$$LM = T \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij}^2$$

Where:

- T: Number of periods
- N: Number of cross-sections
- p_{ij}: Estimated correlation of residuals between cross-sections i and j

The Breusch-Pagan LM test is valid for datasets with small **N** and large **T**, but it may over-reject the null when **N** is large.

2. The Bias-Corrected Scaled LM Test reduces size distortions by modifying the Breusch-Pagan LM statistic for big N.

$$LM_{adj} = \sqrt{\frac{2}{N(N-1)}} \left(LM - \frac{N(N-1)}{2} \right)$$

3. Pesaran CD Test: This test determines the average correlation of residuals across all cross-sections in order to assess the null hypothesis that there is no cross-sectional dependence. According to the null hypothesis, the test statistic is asymptotically normal:

$$CD = \sqrt{\frac{2T}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij}$$

Table 3 displays the test statistics and probability values for the Pesaran CD, Breusch-Pagan LM, and Bias-corrected scaled LM tests. These tests are used to evaluate the cross-sectional dependency of economic growth, imports, exports, and foreign direct investment for the nations in the sample. The test probability values at various significance levels are taken into account when interpreting the analytical results. In this case, the H0 hypothesis is rejected at the 1% significance level based on the probability values ($p<0.01$) of the Breusch-Pagan LM and Bias-corrected scaled LM tests for the export, economic growth, and FDI variables.

With the exception of the Pesaran CD test in the FDI example (statistic = 1.603, p=0.1090), all three tests for FDI and Economic Growth typically demonstrate the existence of cross-sectional dependence. Given their better sensitivity in smaller datasets, the other tests may have picked up on a weak reliance. Regarding imports (IMP) and exports (EXP): The results of the Breusch-Pagan LM test show a considerable dependency in imports (p=0.0010) but a weak or nonexistent cross-sectional dependence in exports (p=0.1154). Both variables' dependence is detected via the bias-corrected scaled LM test. Cross-sectional dependence for both variables is not confirmed by the Pesaran CD test (p>0.05).

The existence of long-term correlations between variables that have a shared stochastic tendency is known as cointegration. Accordingly, it is claimed that when cointegration is present, variables cannot function independently of one another (İşleyen et al., 2017; Demir et al., 2023). Nonetheless, time series must be stationary to use cointegration analysis. One of the fundamental requirements of the forecasting process is the stationarity of the time series. Variance and mean of the series remain constant across time in stationary series and it is presumed that the series has a unit root (Demir, 2021). Second-generation unit root tests were chosen to be used following the horizontal cross-section dependence test. Table 4 presents findings from the CADF and CIPS unit root testing.

Tablo 4: CADF/ CIPS Unit Root Test

Variables	**CADF**			**CIPS**	
	Z [t-bar]	**P Value**		**Z [t-bar]**	**CV (1%)**
Level					
FDI	-1.870	0.031		-3.326	-2.5
EXP	-0.555	0.289		-1.977	-2.5
IMP	-0.269	0.996		-2.019	-2.5
EG	-3.317***	0.000		-3.885	-2.5
1ST DIF					
FDI	-5.387***	0.000		-5.422	-2.57
EXP	-6.585***	0.000		-4.992	-2.57
IMP	-4.207***	0.000		-5.283	-2.57
EG	-4.547***	0.000		-6.094	-2.57

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

(ii)The critical values of the first difference equations of the terms are-2.21 (10%) and-2.33 (5%).

Table 4 presents the results of the CADF/CIPS unit root test. According to the results obtained, since the level values of the data were found to be statistically insignificant in the CADF test except for the economic growth variable, it was determined that the variables contained unit root and were not stationary. According to the CIPS test results, when compared with the critical values at 1% significance levels of all variables except economic growth and foreign direct investment variables, it was found that the test values of all variables were smaller than the critical value. Therefore, the CIPS test also showed that the variables are non-stationary. According to the CADF/CIPS test results obtained after the first differences taken to eliminate the stationarity of the series, the variables were found to be significant at 1% and 5% levels. In this context, according to the unit root tests, the series became stationary after the first differences were taken.

When the first differences of all variables are taken and analysed with the CIPS test, it is seen that all variables become stationary in the first difference at 5% and 10% significance levels, while only economic growth and foreign direct investment variables do not become stationary at 1% significance level. Since the CIPS test is taken into account in the study, it can be said that the series do not contain unit root at 1% and 5% significance levels and therefore become stationary in the test performed by taking the first differences of the variables. Thus, cointegration analysis can be applied to the series that are made stationary by taking their first differences.

Heterogeneity has a very important place in determining the roots in cointegration and unit root analyses. In this context, whether the slope parameters are homogeneous is tested with the delta test (Demir & Görür, 2020). To decide on the test statistics to be used in cointegration analysis, the Delta homogeneity test was performed first. The homogeneity test is used to determine whether the coefficients of the model are homogeneous in the long run. The results of the analysis are presented in Table 5.

Table 5: Delta Homogeneity Test

	(Pesaran ve Yamagata, 2008)		**(Blomquist Westerlund, 2013)**	
	Test statistic	**Prob**	**Test statistic**	**prob**
Δ	9.308	0.001	4.775	0.001
$\tilde{\Delta}$	10.164	0.001	5.214	0.001

Table 5 shows the delta homogeneity test results. The results of the homogeneity analysis of the slope coefficients of the variables for the sample countries are given. According to the results given in the table, the null hypothesis that the slope coefficients are homogeneous is rejected at 1% significance level. In other words, slope coefficients are heterogeneous. Therefore, the existence of cointegration between variables will be determined by using G_t and G_a test statistics. After determining that the series are heterogeneous according to the homogeneity test, Westerlund (2007) co-integration test is applied. The test findings of Westerlund (2007) are given in Table 6.

Tablo 6: Westurlund (2007) Co-integration Test

FDI-EXP		
	Statistics	**P Value**
G_t	-3.368***	0.001
G_a	-17.078***	0.001
FDI-IMP		
	Statistics	**P Value**
G_t	-6.478 ***	0.001
G_a	-17.302***	0.001
FDI-EG		
	Statistics	**P Value**
G_t	-6.226***	0.001
G_a	-16.625***	0.001

(i)*, **, *** denote significance levels of 10%, 5% and 1%, respectively. (ii)P < 0.01

Westerlund's (2007) co-integration test results are presented in Table 6. In the test results, bilateral co-integration relations of FDI variables with other variables were examined respectively. As a result of the analysis, it was concluded that FDI is co-integrated with other variables (Imports, Exports and economic growth), that is, there is a long-run relationship between them. In this context, the probability values ($p<0.01$) of Westerlund and group statistics are found to be significant at 1%.

Table 7: Extended Mean Group (AMG) Test Statistics

DFDI	**Coefficient**	**Standard Error**	**Z Value**	**P Value**
DIMP	.1880994***	.0419762	4.48	0.001

DEXP	-.1303078***	.0387692	-3.36	0.001
DEG	-.0128898	.0265157	-0.49	0.627
CONS	.3202934***	.0720856	4.44	0.001

(i)*, **, *** denote significance levels of 10%, 5% and 1%, respectively.

(ii)P < 0.01

Table 7 presents the results of AMG test statistics. Extended mean group (AMG) test statistics are given for the sample countries. In the Westerlund (2007) panel cointegration test, long-run parameter coefficients are estimated when there is a cointegrated relationship in the series in the long run. According to the data obtained from the AMG test results, the relationship between FDI and independent variables was tested. In this context, the coefficient of imports and FDI was found to be positive and significant (4.48) at 1% probability value. When the direction in which the export rate affects FDI is analysed, it is found that there is a negative (-3.36) relationship between them and the probability value (0.001) is significant at 1%. When the relationship between the economic growth variable and FDI is analysed, it can be said that there is a negative relationship between the variables: (-0.49) probability value (0.627) was found to be statistically insignificant.

Table 8: Pooled Mean Group (PMG) Test Statistic

FDI	**Long-run forecast**	
	Coefficient (PMG)	**P Value**
Exp	-.1036912***	0.001
Imp	-.0134005	0.866
Eg	.5655493***	0.001
Short-run forecast		
Exp	.090961***	0.006
Imp	-.0107345	0.789
Eg	-.0485894	0.100
Cons	.4991461***	0.001
Ec	-.2225211***	0.007

(i)*, **, * denote significance levels of 10%, 5% and 1%, respectively. (ii)P < 0.01

PMG test statistics are presented in Table 8. Long and short-run PMG test statistics results are given for the sample countries. According to the data in the table, it is found that the import variable has a negative and significant effect on FDI in the long run, while the economic growth variable has a significant and positive effect on FDI. When the export variable is analysed, it is found that it has a negative and insignificant effect on FDI. According to the short-term estimation data, the import variable has a significant and positive effect on FDI, while the export variable has an insignificant and negative effect on FDI. The relationship between the economic growth variable and FDI has a negative and insignificant effect.

Conclusion

FDI is an important driving force in ensuring economic growth and international trade in terms of the interaction of two countries. (OECD, 2022; Essandoh vd., 2020: 2). This is highlighted by the cumulative insights from studies conducted by Purnama and Yao (2019), Güzel and Tünsoy (2023), Sezer (2018), Taşdemir and Erdaş (2018), Ersin and Tufaner (2018), and Sevinç and Şeker (2023). All of these studies show that foreign direct investment (FDI) has a major role in promoting trade expansion, both in terms of imports and exports, as well as long-term economic integration and growth of countries, especially rising economies such as those in Asia and the BRICS. Empirical data from these studies provides compelling support for the idea that trade liberalisation can serve as a powerful stimulant for long-term economic growth when combined with well-timed FDI inflows. Various methodological techniques, including panel data analysis, cointegration, and impulse-response analysis, have been employed to confirm the significance of foreign direct investment (FDI) in promoting economic connections and promoting development in various settings. The research has revealed

intricate and frequently asymmetrical correlations among foreign direct investment, trade, and economic growth. This underscores the necessity for tailored economic policies that can adjust to the distinct circumstances of individual countries. In addition, the results support a comprehensive method of formulating economic policies, combining trade laws, tax breaks for investors, and methods for luring foreign direct investment to promote sustainable long-term growth. As the E-7 countries have shown, to obtain more dependable and significant findings from empirical analyses, it is imperative to carefully evaluate cross-sectional dependencies and heterogeneities.

All things considered, this collection of studies offers a solid basis for comprehending the complex connections among foreign direct investment, trade, and economic growth. It also offers insightful information to policymakers who seek to maximise economic results in a world economy that is becoming more intertwined by the day. In the ever-changing context of international commerce, the strategic incorporation of foreign direct investment (FDI) into national and regional trade policy is not only beneficial but also necessary to sustain economic life.

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Araştırma Makalesi

The Impact of Foreign Direct Investments on Economic Growth and International Trade: The Example of E7 Countries

Doğrudan Yabancı Yatırımların Ekonomik Büyüme ve Uluslararası Ticaret Üzerindeki Etkisi: E7 Ülkeleri Örneği

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Genişletilmiş Özet

Doğrudan yabancı yatırım (DYY), uluslararası ticareti teşvik ederek ve ekonomik büyümeyi canlandırarak küresel ekonomik entegrasyonda önemli bir rol oynamaktadır. Bu çalışma, panel veri çerçevesinde DYY, ihracat, ithalat ve ekonomik büyüme arasındaki dinamik etkileşimleri araştırmayı amaçlamaktadır. Bu çalışma, 1992-2022 dönemi için panel veri analizi yoluyla E-7 ülkelerindeki (Brezilya, Endonezya, Rusya, Meksika, Türkiye, Çin ve Hindistan) DYY-büyüme bağının kapsamlı bir analizini amaçlamaktadır. Böylesine heterojen bir gelişmekte olan piyasa grubunda DYY-büyüme bağına ilişkin belirli özellikleri ortaya koymanın yanı sıra coğrafi odağın kapsamını genişletmeyi amaçlamaktadır. Ayrıca, ithalat ve ihracat bir bütün olarak uluslararası ticaret yerine ticaret göstergeleri olarak ele alınmıştır. Diğer küçük/alışılmadık çalışmalarla arasındaki çarpıcı farklardan biri, birincilerin normalde kısa vadeli dinamiklere odaklanması ve/veya sadece bir ülkeyi incelemesine karşın, bu çalışmanın uzun vadeli eğilimleri incelemesi ve E-7 ekonomileri için toplu olarak politika ile ilgili sonuçlar önermesidir. Sistematik ve karşılaştırmalı metodolojinin benimsendiği bu çalışmada, araştırma önyargılarını ve ülkeler arasındaki heterojenliği ele almak için gelişmiş panel veri teknikleri kullanılmaktadır. Çalışmanın bulguları, DYY'nin özellikle gelişmekte olan ekonomilerde ticaretin serbestleştirilmesi ve uzun vadeli ekonomik istikrar için bir katalizör olarak öneminin altını çizmektedir. Bu çalışmada kullanılan ekonometrik model Denklem (1) ve (2)'ye dayanmaktadır. Denklem (1) DYY'yi ihracat (EXP), ithalat (IMP) ve ekonomik büyümenin (EG) bir fonksiyonu olarak ifade etmektedir. Denklem (2) genişletilmiş model spesifikasyonunu sağlamaktadır. Burada, doğrudan yabancı yatırımı temsil eder, bir sabittir ve sırasıyla ihracat, ithalat ve ekonomik büyümenin katsayılarıdır. Hata teriminin sıfır ortalamaya, sabit varyansa ve normal dağılıma sahip olduğu varsayılmaktadır. Analizde katsayıları tahmin etmek için STATA ekonometrik paketi kullanılmıştır.

Veri seti dört değişkeni kapsayan 217 gözlemden oluşmaktadır: DYY, ihracat, ithalat ve ticaret dengesi (EG). Tanımlayıcı istatistikler bu değişkenler arasında kayda değer farklılıklar olduğunu ortaya koymaktadır. Ortalama 2.05 DYY puanı ve 1.38 standart sapma, DYY girişlerindeki ılımlı sapmayı vurgulamaktadır. Değerlerin-2.76'dan 6.19'a kadar olan aralığı hem yatırımdan vazgeçme hem de önemli pozitif giriş örneklerine işaret etmektedir. İhracatın ortalaması 22,39 olup, standart sapması 7,55'tir ve 8,39 ile 48,25 arasında

değişmektedir; bu da ihracat performansında önemli farklılıklar olduğunu göstermektedir. İthalat ise 23,56 ortalama değer ve 6,73 ile 62,32 arasında değişen 8,81'lik daha yüksek bir standart sapma göstermektedir. Ticaret dengesi (EG), 3,24 ortalama ve 4,57 standart sapma ile en yüksek değişkenliği sergilemekte ve hem önemli ticaret açıklarını hem de fazlalarını yansıtmaktadır. Bu tanımlayıcı istatistikler ticaret ve yatırım faaliyetlerinin dinamik yapısını vurgulamaktadır. DYY'deki değişkenlik, yabancı yatırımların ülkeler arasındaki farklı cazibesinin ve erişilebilirliğinin altını çizmektedir. İhracat ve ithalat değerlerindeki farklılıklar, temel ticari dengesizliklere ve ekonomik koşullara işaret etmektedir. Ticaret dengesi değişkenindeki dalgalanmalar, ticaret dinamikleri ile DYY arasındaki etkileşimi vurgulamakta ve daha fazla araştırma için yollar önermektedir.

Yatay kesit bağımlılık testleri panel veri analizinin ayrılmaz bir parçasıdır ve yatay kesit birimleri arasındaki artıkların bağımsız olmasını sağlar. Yatay kesit bağımlılığının göz ardı edilmesi yanlı ve tutarsız tahmincilere yol açabilir. Bu çalışmada yatay kesit bağımlılığını değerlendirmek için Breusch-Pagan LM testi, yanlılığı düzeltilmiş ölçeklendirilmiş LM testi ve Pesaran CD testi kullanılmıştır. Az sayıda yatay kesit (N) ve büyük dönemlere (T) sahip veri setleri için uygun olan Breusch-Pagan LM testi, yatay kesitler arasındaki karesel artık korelasyonlarının toplamını hesaplamaktadır. Ancak, N büyük olduğunda boş hipotezi aşırı reddedebilir. Yanlılığı düzeltilmiş ölçeklendirilmiş LM testi, daha büyük N için Breusch-Pagan LM istatistiğindeki boyut bozulmalarını ele alır. Pesaran CD testi, kesitler arasında kalıntıların ortalama korelasyonunu değerlendirerek yüksek boyutlu panel verileri için sağlamlık sunar.

Tablo 3, bu testler için test istatistiklerini ve olasılık değerlerini sunmaktadır. Breusch-Pagan LM ve yanlılığı düzeltilmiş ölçeklendirilmiş LM testleri ihracat, ekonomik büyüme ve doğrudan yabancı yatırımlar için yatay kesit bağımlılığı olmadığı boş hipotezini %1 anlamlılık düzeyinde reddetmektedir ($p < 0.01$). Ancak, Pesaran CD testi DYY için yatay kesit bağımlılığını doğrulamamaktadır (istatistik = 1.603, $p = 0.1090$). İthalat için Breusch-Pagan LM testi önemli bir bağımlılığa işaret ederken ($p = 0.0010$), ihracatta yatay kesit bağımlılığı zayıftır veya yoktur ($p = 0.1154$). Bu bulgular, testlerin veri seti özelliklerine olan duyarlılığının altını çizmekte ve panel veri analizinde yatay kesit bağımlılıklarının ele alınmasının önemini vurgulamaktadır.

Zaman serisi verilerinin durağanlığı, ortak stokastik eğilimlere sahip değişkenler arasındaki uzun vadeli ilişkileri inceleyen eşbütünleşme analizi için bir ön koşuldur. Bu çalışmada durağanlığı değerlendirmek için CADF ve CIPS birim kök testleri kullanılmıştır. Tablo 4 test sonuçlarını özetlemektedir. CADF testi, ekonomik büyüme hariç tüm değişkenlerin birim kök içerdiğini ve seviye değerlerinde durağan olmadıklarını ortaya koymaktadır. Benzer şekilde, CIPS testi, %1 anlamlılık düzeyinde kritik değerlerle karşılaştırıldığında, ekonomik büyüme ve doğrudan yabancı yatırımlar hariç tüm değişkenler için durağan olmadığını doğrulamaktadır. Ancak değişkenlerin birinci farkları alındıktan sonra seriler %1 ve %5 anlamlılık düzeylerinde durağan hale gelmektedir. Bu sonuçlar, durağan serilere eşbütünleşme analizinin uygulanmasını doğrulamaktadır.

Çalışma ayrıca Delta homojenlik testini kullanarak eğim parametrelerinin homojenliğini de değerlendirmektedir. Tablo 5, %1 anlamlılık düzeyinde homojen eğim katsayıları boş hipotezini reddeden test sonuçlarını sunmaktadır. Bu bulgu, örnek ülkeler arasında eğim katsayılarının heterojenliğini vurgulamakta ve heterojenliği hesaba katmak için Westerlund (2007) eşbütünleşme testinin kullanılmasını gerektirmektedir. Tablo 6, DYY ile bağımsız değişkenler (ithalat, ihracat ve ekonomik büyüme) arasında eşbütünleşmenin varlığını doğrulayan Westerlund test sonuçlarını sunmaktadır. Grup istatistikleri için olasılık değerleri ($p < 0.01$) değişkenler arasında önemli bir uzun dönemli ilişki olduğunu göstermektedir.

Genişletilmiş ortalama grup (AMG) testi ayrıca uzun dönem parametre katsayılarını incelemektedir. Tablo 7, ithalat ve DYY arasında pozitif ve anlamlı bir ilişki olduğunu gösteren AMG test sonuçlarını sunmaktadır (katsayı = 4.48, $p < 0.01$). Tersine, ihracat DYY ile negatif bir ilişki sergilemektedir (katsayı = -3.36, $p < 0.01$). Ekonomik büyüme değişkeni ise DYY ile negatif ancak istatistiksel olarak anlamsız bir ilişki göstermektedir (katsayı = -0.49, $p = 0.627$). Tablo 8'de sunulan PMG testi hem uzun hem de kısa dönemli tahminler sunmaktadır. Uzun dönemde, ithalat DYY üzerinde negatif ve anlamlı bir etkiye sahipken, ekonomik büyüme DYY'yi pozitif yönde etkilemektedir. İhracat ise DYY üzerinde negatif ve anlamsız bir etki göstermektedir. Kısa dönemde, ithalat DYY'yi pozitif ve anlamlı bir şekilde etkilerken, ihracat ve ekonomik büyüme negatif ve anlamsız etkiler sergilemektedir. Bu bulgular DYY, ticaret ve ekonomik büyüme arasındaki karmaşık ve asimetrik ilişkilerin altını çizmektedir.

Çalışmanın bulguları, DYY'nin ticaretin genişlemesini ve ekonomik entegrasyonu teşvik etmedeki önemli rolünü vurgulayan mevcut literatürle uyumludur. Purnama ve Yao (2019), Güzel ve Tünsoy (2023) ve diğerleri tarafından yapılan çalışmalar, özellikle gelişmekte olan ekonomilerde ticaretin serbestleşmesini ve uzun vadeli

ekonomik büyümeyi teşvik etmede DYY'nin önemini vurgulamıştır. DYY, ticaret ve ekonomik büyüme arasındaki karmaşık ilişkiler, her bir ülkenin kendine özgü koşullarını dikkate alan özel ekonomi politikaları gerektirmektedir. Politika yapıcılar, sürdürülebilir ekonomik büyüme elde etmek için ticaret düzenlemeleri, vergi teşvikleri ve DYY çekme stratejilerini birleştiren kapsamlı bir yaklaşım benimsemelidir.

Bu çalışma aynı zamanda ampirik analizlerde kesitsel bağımlılıkların ve heterojenliklerin ele alınmasının önemini vurgulamaktadır. AMG ve PMG testleri gibi sağlam ekonometrik metodolojiler, değişkenler arasındaki dinamik etkileşimler hakkında değerli bilgiler sağlamaktadır. Bu bulgular, DYY, ticaret ve ekonomik büyüme arasındaki karmaşık etkileşimi anlamak için sağlam bir temel sunmakta ve politika yapıcılara etkili ekonomi politikaları oluşturmada yol göstermektedir. Küreselleşme uluslararası ticareti yeniden şekillendirmeye devam ederken, DYY'nin ulusal ve bölgesel ticaret politikalarına stratejik entegrasyonu, uzun vadeli ekonomik istikrar ve büyümeyi teşvik etmek için önemini korumaktadır.