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Heterogenous Panel Modeling on Foreign Direct Investments in E7 Countries

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ABSTRACT

With the spread of free economy conditions, the increase in the international mobility of capital has led to an increase in the number of economies that want to attract capital and the opportunities it will provide. In addition to this, capital owners have started to use free movement opportunities in order to maximize their own benefits. In this context, the factors affecting foreign direct investments including long-term capital flows have been the subject of many empirical studies. In this study which is carried out within the scope of the annual data of E7 economies for the period of 1992-2021, it is aimed to reveal the relationships between net foreign direct investment inflows and unemployment, liberal democracy, public expenditures, foreign direct investment outflows and short-term borrowing. In the study, in which the heterogeneous panel data method based on seemingly unrelated regression analysis was used, it was determined that the realizations under the influence of the selected independent variables differed by countries, but it was found that all the variables included in the analysis had a decisive role on foreign direct investment inflows.

Keywords: Foreign Direct Investment, Unemployment, Democracy.

JEL Classification Codes: O47, E25, H11

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INTRODUCTION

Nowadays, rapid increase of globalization, due to the spread of liberal economic policies, countries' adaptation to free market environment has gained a new dimension which includes a must rather than a choice. In this context here, indifference to innovative practices that serve the functionality of economic growth and development dynamics has led to low developments by preventing countries from taking a place in the global market. In this framework, foreign direct investments (FDI), which is defined as international investments that allow the residents of the country to obtain a permanent share from a company located in another country have also attracted attention by taking their place in the economic environment (IMF, 2012: 86). These investments, which are of great economic importance, especially for developing countries, are vital not only for the technology transfer they provide, but also for their capacity to create employment and to be a source of financing. The functional status of FDIs which is observed to contribute to overcoming the economic problems faced by countries, has revealed the necessity of closely monitoring the behavior of the capital in question. As a matter of fact, it is known that these investments are highly resilient to economic conjuncture, global crises, political and economic instabilities, credit ratings, terrorism, natural disasters and similar reasons. Therefore, it is of utmost importance that analyses are constantly updated and relevant policies are revised according to the current situation.

It can be said that foreign capital mobility, which has increased rapidly, especially after the 1980s, is because the control power of multinational companies over global trade has reached very high levels as a result of trade liberalization, technological innovations and globalization (UNCTAD, 2022). However, the reasons why FDIs, known to be high in developed countries, tend to these countries are significant. For developing countries, these reasons include social, economical and political stability, the environment of trust, research and development capabilities and technological infrastructure. Therefore, it has become inevitable for developing countries willing to take part in the global economy to focus on some regulations to direct the said investments to themselves. These regulations include privileges such as labor market policies, tax

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incentives and exemptions, bureaucratic conveniences, customs tariff facilities and facilitating resource supply. In addition, furthermore, many reasons such as ignorance in the labor market and the lack of legal protection create important opportunities for multinational companies and create an area of attraction for investments (Fröbel et al., 1978: 126-128). In this context regard, the need for foreign savings and the insufficiency of foreign exchange resulted in the positioning of FDIs among their priority preferences, especially in countries that have problems in financing the necessary investments due to the lack of domestic savings.

It is well-known that FDIs have some key benefits for host countries, such as having long-term financing characteristics and supporting development and economic growth, unlike portfolio investments that are "hot money" and can be withdrawn quickly (Walsh and Yu, 2010). Moreover, when there is an economic crisis in the host country, short-term portfolio investments are more likely to experience outflows than FDIs. As known, the most cooperation of FDIs in the host country is seen as a reason for the low tendency to flee the country (Busse and Hefeker, 2007). Although these investments attract attention in terms of the advantages they provide for the host country, they show a complex appearance in terms of location preferences. While the motive, type, sector and volume factors specific to the investment to be made within the said framework are highly determinative in terms of region preference, the course of economic factors may also bring different factors to the agenda. These factors, which were summarized as economic, political and business-facilitating factors in the 1998 World Investment Report, were listed comprehensively. In the report, while factors such as income per capita, market access, market volume, physical infrastructure and labor cost are expressed as economic factors, tax, political and social stability, privatization, trade policies, rules on market mobility and international agreements are stated as political factors. Business facilitation practices include policies such as social opportunities, investment incentives, and promotions (UNCTAD, 1998: 91).

Looking at the global course of FDI movements, it is observed that global FDI inflows, which were 204 billion dollars in 1990, reached 1.356 trillion dollars in 2000 and 2.06 trillion dollars in 2016. It is thought that factors such as applications facilitating free trade, accelerating technological developments and various cost advantages are effective in reaching these high figures (Santoro, 2020). A significant increase of 28% was observed in the period from the last quarter of 2021 to the first quarter of 2022, and a significant part of this increase was recorded in OECD countries (OECD and UNCTAD, 2022).

In this context, the functional relationships between unemployment rate, liberal democracy index, public expenditures, net foreign direct investment outflows short-term debts and net foreign direct investment inflows of E7 countries are investigated for 1992-2021. The main purpose of the study was to contribute to the creation of resources for future studies and policymakers by making various evaluations about the foreign investment attracting potential of the relevant country group.

The first issue addressed in the analysis is the effect of the unemployment rate on FDIs. When an evaluation is made in terms of labor costs, the increases observed in the labor population who are willing to accept lower wages in economies with high unemployment rates should be considered as natural. It is thought that a positive effect mechanism will operate due to the cost advantage that arises in the said conditions. However, when evaluated from another point of view, a different result may be encountered if the labor factor that accepts low wages arises from unqualified and inefficient work. This means that if wage payments have a low-cost share for FDIs, a different cost element emerges than an advantage (Chakrabarti, 2001: 99). In addition, it is possible for FDIs to perceive negatively high the unemployment rates despite low labor costs, as they are one of the indicators of macroeconomic instability. Therefore, the effect of the unemployment rate variable on FDI inflows may vary.

Secondly, the high liberal democracy index, which is examined, means an increase in free economy market conditions. It is predicted that the economic growth rates realized in the countries where the said freedom is widespread will be sustainable and fast (De Haan and Sturm, 2000: 216). Moreover, the riskiness of FDIs for foreign investors might differ based on how democratic and stable the host country is. In the economies where democratic conditions are high, the risks that may arise with state intervention are reduced and private property rights are more protected (Asiedu and Lien, 2011). Therefore, this situation can contribute to the level of development and form the basis for more investment. Litigation-like situations that may arise in liberal economies where consumer rights are highly protected may cause investors to behave timidly. According to Busse (2003), the changes in the sectoral preferences of FDIs and the negative perspectives of non-governmental organizations in host countries towards foreign

investments can eliminate the influence of democratic conditions. From another perspective, transparent economic policies operating in economies with high democratic conditions have limited the advantages provided for FDI. In autocracies, the amount of FDI inflows may increase as governments provide more advantages as a result of their concerns about staying in power (Li and Resnick, 2003; Jensen, 2003).

When the possible effects of the public expenditures/GDP ratio, which is an indicator of the share of the public sector in the economy, are examined, it is possible to say that the effect of government expenditures on FDI inflows varies. For example, Othman et al. (2018) and Choong et al. (2015) observed that government expenditures had positive effects on FDI inflows, but Bénassy-Quéré et al. (2007) and Anwar (2017) found evidence that the impact direction was negative. Studies confirming the positive interaction mechanism argue that economic growth will be positively affected if public expenditures are directed towards productive economic activities, and it is stated that more FDI inflows can be realized thanks to strong structures. Moreover, in addition to the decline in public revenues, public expenditures increase as a result of the fiscal packages implemented. Open budget policies are frequently resorted to, especially during the contractionary periods of the business cycle. It is possible to say that this emerging borrowing need also plays a determining role in FDIs. In this regard, it is known that policies aimed at increasing the amount of foreign investment in the country are preferred due to the ability of FDIs to be a long-term financing source. However, As Bénassy-Quéré et al. As (2007) stated, factors such as the crowding out effect of increases in public expenditures on private investments, corruption and lack of management may adversely affect FDI inflows.

FDI outflows, which are considered in the analysis, should not be considered separately from the FDI flow into the country. Investors coming to and leaving a country closely follow each other. In this context, in addition to the special opportunities followed by foreign investors, the political and economic stability in the host country is quite decisive and foreign capital may have doubts about turning to risky areas. Therefore, FDI inflows in countries where an environment of trust cannot be ensured may be lower than FDI outflows. This situation may result against the host country. An increase in capital outflows in a country is not always considered as a capital flight, but a high-level flow can be considered as a flight. In this case, it can be observed that an escape situation occurs due to reasons such as deterioration of macroeconomic stability, overvaluation of exchange rates, open budget, high real interest rates, high inflation, and political instability (Onodugo et al., 2014: 11). Investors tend to go to safer areas by increasing their risk perceptions in times of economic crisis and uncertainty. In this case, capital outflows may cause more serious problems, especially in countries that have financing problems due to foreign debt and high current account deficits. Therefore, it can be expected that FDI outflows in any country will adversely affect the incoming capital. However, it is also possible for FDI outgoing from the country to have a positive effect on capital inflows.

Foreign borrowing is a macroeconomic resource that governments frequently utilize to increase their revenues and finance current accounts and budget deficits. However, debt crises experienced frequently in developing countries are seen as a reason for preferring open economy policies and financial liberalization. In this sense, FDIs needed to finance borrowing are expected to reduce the amount of debt. On the other hand, as Ostadi and Ashja (2014), Nonnemberg and De Mendonça (2004) and Ramirez (2006) point out, increasing external debt burden may be the cause of a possible balance of payments problem in economies. This situation may have negative consequences on FDI inflows by increasing the risk perception of foreign capital. From another point of view, the increasing debt burden may be a reason for offering cheaper investment opportunities for foreigners. As a result of increasing FDI inflows, the need for borrowing will also decrease. In this context, for this reason, it is possible to come across studies which have found that the effect of external debt on FDI is positive. Some of these studies can be listed as Chan and Gemayel (2004), Singh and Jun (1995), Bozkurt (2009), Khrawish and Siam (2010).

EMPIRICAL LITERATURE REVIEW

It is observed that there are a large number of studies in the economic literature regarding FDIs. It is known that the diversity of impact factors used in the analyses and methodological differences and deeper analysis are more closely monitored. For these reasons, in this context, the factors affecting FDI depending on country-based qualitative differences are important for the policies to be followed. A summary of selected empirical analyses in this framework is presented in Table 1.

Table 1 shows that there is no consensus on the subject. Indeed, national dynamics may have positive or negative effects on FDI attraction. Moreover, there are also findings that many variables that are thought to be effective on

Table 1. Summary of Empirical Literature

Authors	Country/ Period	Method	Results
Chakrabarti (2001)	135 Countries	EBA, Cross-Section Analysis	It is determined that foreign trade deficit has negative effects on FDI inflows. It is emphasized that real exchange rate, economic growth rate and trade openness have positive effects.
Jensen (2003)	114 Countries / 1970-1997	OLS	It has been determined that the increasing level of democracy has positive effects on the amount of FDI coming into the country.
Li and Resnick (2003)	53 Developing Countries / 1982-1995	Fixed Effects Model, Granger Causality Analysis, GEE, OLS, 3SLS	It has been stated that increases in the level of democratization create an optimum investment area and reduce the risk perception of foreign investors by contributing to the protection of property rights. Therefore, it was emphasized that democratization increased FDI inflows.
Busse (2003)	69 Developing Countries / 1972-1999	Fixed Effects Model, Granger Causality Analysis	It has been found that increasing democratization increases the amount of FDI coming into the country.
Yang (2007)	138 Countries / 1983-2002	OLS, SUR	It has been found that increases in the level of democratization are not effective in attracting FDI to the country, but more foreign investment comes if stability is achieved in autocratic administrations.
Asiedu and Lien (2011)	112 Countries / 1982-2007	GMM	According to the findings, the effect of democracy increases on FDI inflows in countries with a high natural resource content in their export structure is negative. It is concluded that this effect is positive in countries with the opposite structure.
Kuncic and Jaklic (2014)	34 OECD Countries /1990-2010	Gravity Model	It has been emphasized that a positive interaction mechanism operates on FDI inflows in countries with a liberal social structure.
Musabeh and Zouaouni (2020)	5 North African Countries/1996-2013	Driscoll-Kraay Panel Regression Analysis	It has been found that free trade developments and local investments belonging to the host country positively affect FDI inflows.

FDI inflows do not play a role contrary to expectations. In light of these findings, it is important to identify the complex relationships focused on in this study. It aims to conduct a differentiated analysis by including short-term external debt burdens and outflowing FDIs in the model.

DATASET AND MODEL

The analysis of the annual data of the E7 economies consisting of Brazil, China, India, Indonesia, Mexico, Russia and Türkiye for the period 1992-2021 focuses on foreign direct investment inflows. The main objective is to reveal the relationship between FDI inflows and unemployment, liberal democracy, public expenditures, FDI outflows, short-term borrowing. Accordingly, it is aimed to evaluate the realizations under the influence of these variables within the framework of foreign direct investment inflows. The period of the study was constrained to harmonize the data set. In this context,

Table 2. Dataset and Summary Statistics

Variable	Description	Source
gdyyo	Foreign Direct Investment, Net Inflows (% of GDP)	World Bank (2023)
İo	Unemployment Rate (% of Total Labor Force)	
lde	Liberal Democracy Index	V-Dem (2023)
kho	Government Final Consumption Expenditures (% of GDP)	World Bank (2023)
cdyyo	Foreign Direct Investment, Net Outflows (% of GDP)	
kdbo	Short-Term Debt (% of Total External Debt	

Summary Statistics

Obs.	Desc. Stat.	gdyyo	io	lde	kho	cdyyo	kdbo
210	Mean	2.066	6.816	0.400	13.682	0.691	19.198
	Max.	6.187	13.930	0.791	21.067	3.774	73.170
	Min.	-2.757	2.370	0.039	5.694	-1.244	2.756
	Std. Dev.	1.359	2.733	0.232	3.906	0.804	14.091
	Skewness	0.084	0.506	-0.193	0.162	1.790	2.117
	Kurtosis	3.5136	2.507	1.823	1.8497	6.711	7.314

the explanations and summary statistics of the variables used in the analysis are presented in Table 2.

As seen in Table 2, the proportional variables were used while creating the data set obtained within the scope of 31 years and 210 observations. No excessive deviation was found in the graphical examinations. In addition, logarithmic transformation was not applied because there was no significant difference between the maximum and minimum values of the variables that did not contain negative values.

In panel data analysis, when working with 30 and more than 30-time dimensions, the series should first be tested in terms of stationarity conditions. For the testing process, the characteristics of the variables in terms of horizontal cross-section dependence and homogeneity should be determined. In this context, Pesaran's (2015) CD cross-section dependency test, which can be used in cases where the time dimension (t) is larger than the unit dimension (n) and n is less than 10, was used in the analysis. Stating that there is a weak cross-section dependence between the panel units, H_0 The CD test results, which tested the hypothesis against the alternative hypothesis that predicted a strong correlation, are given in Table 3.

In Table 3, it is seen that the basic hypothesis of the test was rejected for all variables except the kdbo variable. Accordingly, it is observed that there is no inter-unit correlation in the kdbo variable, which may be a problem for panel units. For other variables, the presence of correlation is found.

Table 3. Cross-Sectional Dependence Test

Variable	CD Test Statistics
gdyyo	3.236 (0.001)
io	2.775 (0.006)
lde	21.319 (0.000)
kho	21.852 (0.000)
cdyyo	8.780 (0.000)
kdbo	1.0480 (0.295)

Note: The numbers in parentheses indicate probability levels.

Homogeneity tests of the variables in the panel were carried out using Swamy (1970) and Pesaran and Yamagata (2008) delta tests. The main purpose of these tests is to determine whether there are unit-specific differences and to take this into account if there is such a structure. The relevant test results are presented in Table 4.

According to the results reported in Table 4, it is seen that the basic hypothesis predicting a homogeneous structure within the scope of the Swamy test was rejected for all variables except lde and kho variables. However, according to the Pesaran and Yamagata test results, all model variables were found to be heterogeneous at the 99% confidence level. Therefore, the existence of a heterogeneous structure cannot be rejected. For this reason, first of all, it is necessary to determine the tests suitable for the structures of the series.

The findings in Table 4 indicate that for the stationarity analysis to be conducted for the kdbo variable, first-generation panel unit root tests that do not include

Table 4. Homogeneity Tests

Variable	Swamy S Test	Pesaran-Yamagata Δ (Delta) Test
gdyyo	chi2(6) = 119.570 (0.000)	
io	chi2(6) = 712.740 (0.000)	
lde	chi2(6) = 0.5200 (0.998)	Δ = 6.073 (0.000)
kho	chi2(6) = 0.1800 (0.999)	Δadj = 6.936 (0.000)
cdyyo	chi2(6) = 80.640 (0.000)	
kdbo	chi2(6) = 152.780 (0.000)	

Table 5. Unit-Root Tests

Variables		gdyyo	io	lde	kho	cdyyo
PANICCA TEST (Level-Constant Term)	ADF Stat.	-2.582 (0.008)	-2.827 (0.004)	-3.612 (0.000)	-1.740 (0.008)	-5.477 (0.000)
Pa	-7.429 (0.000)	-4.291 (0.000)	-26.295 (0.000)	-34.749 (0.000)	-8.633 (0.000)	
Pb	-3.387 (0.000)	-2.252 (0.012)	-7.113 (0.000)	-9.175 (0.000)	-3.556 (0.000)	
PMSB	-1.527 (0.063)	-1.355 (0.088)	-1.562 (0.059)	-2.065 (0.019)	-1.545 (0.061)	
IPS Test (Level-Constant Term)						
Variable kdbo		W-t-bar= -1.901 (0.029)		Lag Length =1		

horizontal cross-section dependence and are sensitive to heterogeneity can be used. For all the other variables used in the research, second-generation panel unit root tests should be applied. However, before the stationarity test, it is important to determine whether the series of variables contains a trend and/or constant term. As a result of the graphical examination, no trend was observed in any of the series, but it was determined that they contained fixed terms. In this context, Im-Pesaran-Shin (IPS) (2003), which is a first-generation test that tests the null hypothesis that panel units contain unit roots, and the Panicca test, which is a second-generation panel unit root test, are utilized. Panicca test is one of the most preferred tests because it allows evaluation for common factors as well as residues (Reese and Westerlund, 2016: 971). The appropriate lag lengths for both tests are set as 1 according to the Akaike (AIC) information criterion. The results of the test applications for stationarity analyses are given in Table 5.

According to the findings of the Panicca test in Table 5, it is seen that the findings of the common factors and residues obtained for the level values of all variables are sufficient for stationarity. Similarly, the kdbo variable, in which the IPS test was applied, also provided the stationarity condition at the 5% statistical significance level.

The method to be used in heterogeneous panel regressions differs depending on whether there is a cross-sectional dependence and heterogeneous structure in the model. Therefore, it is necessary to determine the qualitative characteristics of the functional relationships that are planned to be examined. The model to be examined in this context can be expressed in closed form as follows:

$$gdyyo_{it} = \beta_0 + \beta_1 io_{it} + \beta_2 lde_{it} + \beta_3 kho_{it} + \beta_4 cdyyo_{it} + \beta_5 kdbo_{it} + \varepsilon_{it} \quad (1)$$

In equation (1), t represents the time dimension, i is the cross-section units, and e is the error term. Examining the correlation coefficients and variance amplification factor (VIF) between the independent variables of the relevant model to be estimated is important in terms of a possible spurious regression problem. Based on the fact that VIF values are 10 and less than 10, it can be stated that a possible multicollinearity problem does not pose any threat to regression (Hair et al., 2002: 588). For this reason, before starting the analysis, it is necessary to predict a correlation-based problem and to test the relevant situation to determine whether the regression poses a risk that may threaten its health. The statistics are given in Table 6.

Table 6. Correlation Matrix and VIF Values

Correlation Matrix						
Variable	gdyyo	io	lde	kho	cdyyo	kdbo
gdyyo	1					
io	-0.186	1				
lde	-0.040	-0.084	1			
kho	-0.175	-0.148	-0.031	1		
cdyyo	0.274	-0.054	-0.019	-0.254	1	
kdbo	0.160	-0.201	0.033	-0.027	0.067	1
VIF Values						
Variable	**VIF**			**1/VIF**		
kho	1.10			0.905		
io	1.08			0.922		
cdyyo	1.08			0.924		
kdbo	1.05			0.954		
lde	1.01			0.990		
VIF mean	1.07					

According to the results in Table 6, both correlation and vif values clearly show that there is no multicollinearity problem. After this stage, the regression, which is planned to be carried out, should be subjected to various testing processes to predict with the help of qualitatively compatible analyses. The results of the preliminary tests conducted to determine the estimation method to be used for the model expressed in this framework are presented in Table 7.

Table 7. Correlation Between Unit and Homogeneity Tests

Tests	**Test statistics**
Breusch-Pagan (1980) LM Test	chi2(21) =46.496 (0.001)
Swamy S Test	chi2(36) =336.830 (0.000)
Pesaran-Yamagata Delta Test	Δ = 6.073 (0.000) Δadj = 6.936 (0.000)

According to the statistics reported in Table 6, the results of the Breusch-Pagan LM test, in which inter-unit correlation was tested, show that there is a cross-section dependence at the 99% confidence level. The results of the Swamy S and delta tests, in which homogeneity was tested, confirm that the model contains a heterogeneous structure. For the model planned to be implemented in this framework, Zellner's (1962) SUR (Seemingly Unrelated Regressions) model, which can be employed in heterogeneous structures with inter-unit correlation, can be used. The said heterogeneous model can be used when working within the scope of units smaller than 10, in which the cross-sectional dependence is determined- in other words, the remains of the units are related. Although the relevant countries seem to be independent from each other, there may be an interaction between the error terms of the models of the countries. Moreover, in case of the presence of variance and autocorrelation problems in the SUR model to be estimated, the augmented version of the method can be used. Thus, the model can be made responsive to specification errors. For this reason, some specification tests should be applied primarily within the scope of the model. The results of the tests are presented in Table 8.

When the results given in Table 7 are examined, it is seen that there is no problem of varying variance except for the 1st and 2nd countries. However, the normality test results demonstrated that the error terms of all panel units had normal distribution. The Harvey LM test shows that the null hypothesis of no autocorrelation in the model is statistically rejected for countries 1, 4 and 7. However, the same findings were not observed for

Table 8. Specification Tests for the SUR Model

Tests		Test statistics
Heteroscedasticity Test (Engle (1982) LM ARCH Test)	gdyyo1	3.909 (0.048)
	gdyyo2	11.152 (0.001)
	gdyyo3	0.115 (0.734)
	gdyyo4	2.593 (0.107)
	gdyyo5	1.384 (0.239)
	gdyyo6	0.789 (0.374)
	gdyyo7	0.396 (0.529)
Jarque-Bera (1987) Normality Test	gdyyo1	0.435 (0.805)
	gdyyo2	0.451 (0.798)
	gdyyo3	1.198 (0.549)
	gdyyo4	1.372 (0.504)
	gdyyo5	0.424 (0.809)
	gdyyo6	2.404 (0.301)
	gdyyo7	5.093 (0.078)
Harvey (1991) LM Autocorrelation Test	gdyyo1	5.329 (0.021)
	gdyyo2	3.224 (0.073)
	gdyyo3	0.005 (0.946)
	gdyyo4	8.950 (0.003)
	gdyyo5	0.023 (0.878)
	gdyyo6	0.045 (0.833)
	gdyyo7	5.947 (0.015)

other countries. A form of the SUR model that is sensitive to autocorrelation and heteroscedasticity problems was used in the analysis. The results are reported in Table 9.

According to the results in the first part of Table 9, the R2 of the panel units' values was found to be statistically significant at the 1% level. In this context, it is seen that unit-based models are sufficient in terms of explanatory power. Looking at the inter-unit correlation matrix of the model residuals, it is observed that the highest correlation value is between Russia (6) and Türkiye (7) (55%). According to the findings of the Breusch-Pagan LM test of the model, the 99% confidence level of the test statistic, confirms that there is inter-unit correlation. In other words, within the scope of the relevant test, the main hypothesis that there is no correlation between units in the model was rejected at the 1% statistical significance level.

In Table 9, it has been determined that the countries where the increase in the unemployment rate has a positive effect on the GDP are India and Russia. For Indonesia, there existed a negative interaction between the io and gdyyo variables. In other countries, no statistically significant finding was found. When the parameter values of the determined significant relationships are examined, it is seen that the highest coefficient of effect (83%) is in Indonesia while the lowest (15%) is seen in Russia. However, it should be noted that these effects are negative for Indonesia and positive for Russia. When the effect coefficients of the liberal democracy index are examined, it is seen that the significant relations determined for Brazil and Türkiye are at a very high level. This result indicates that as the conditions of liberal democracy improve in Türkiye, FDI inflows increase, whereas they decrease in Brazil. According to the findings for the kho variable used to represent public expenditures, there is no significant finding for Brazil, China, Russia and Türkiye. It is possible to say that the relationships found to be significant are not at very high levels. The relevant results showed that the effect of the increase in the share of the public sector in the economy on the real GDP was 4% in India, 8% in Mexico, and -17% in Indonesia. Considering the significant coefficients of the foreign direct investment/ GDP ratio leaving the country, it is seen that the interaction determined for India, Indonesia, Russia, and Türkiye is positive. As the direct investments leaving the country increase, the foreign direct investments coming into the country increase. According to the findings for

Table 9. Unit Results of the Robust SUR Model

Country	Dependent Variable	R^2	chi2	P>chi2
Brazil	gdyyo1	0.485	28.04	0.000
Chinese	gdyyo2	0.515	39.42	0.000
India	gdyyo3	0.822	159.29	0.000
Indonesia	gdyyo4	0.473	47.5	0.000
Mexican	gdyyo5	0.459	29.98	0.000
Russia	gdyyo6	0.744	107.88	0.000
Türkiye	gdyyo7	0.321	34.92	0.000

Correlation matrix of residuals

	gdyyo1	gdyyo2	gdyyo3	gdyyo4	gdyyo5	gdyyo6	gdyyo7
gdyyo1	1						
gdyyo2	-0.215	1					
gdyyo3	0.156	-0.056	1				
gdyyo4	-0.428	0.357	-0.032	1			
gdyyo5	0.077	0.253	0.298	0.049	1		
gdyyo6	-0.065	0.282	0.226	0.382	0.083	1	
gdyyo7	-0.190	0.365	0.015	0.487	0.103	0.554	1

Breusch–Pagan LM Test: chi2(21) = 46.757 (0.001)

Country	Independent variable	Coef.	Robust Std. Err.	P>|z|	95% Conf. Interval	
Brazil	io1	0.057	0.059	0.329	-0.058	0.173
	lde1	**-1.880**	**0.875**	**0.032**	**-3.596**	**-0.165**
	kho1	-0.016	0.047	0.728	-0.108	0.075
	cdyyo1	0.238	0.283	0.400	-0.316	0.793
	kdbo1	**-0.103**	**0.049**	**0.035**	**-0.199**	**-0.008**
	_cons	**4.536**	**1.088**	**0.000**	**2.404**	**6.667**
China	io2	-0.861	0.610	0.158	-2.056	0.334
	lde2	0.373	0.626	0.551	-0.853	1.599
	kho2	-0.052	0.045	0.246	-0.140	0.036
	cdyyo2	-0.943	0.541	0.081	-2.002	0.117
	kdbo2	-0.006	0.014	0.676	-0.033	0.021
	_cons	**8.459**	**2.201**	**0.000**	**4.145**	**12.772**
India	**io3**	**0.235**	**0.099**	**0.017**	**0.042**	**0.429**
	lde3	-0.249	0.195	0.218	-0.621	0.142
	kho3	0.040	0.017	0.021	0.006	0.074
	cdyyo3	1.094	0.261	0.000	0.582	1.606
	kdbo3	0.043	0.010	0.000	0.024	0.062
	_cons	-1.983	0.907	0.029	-3.760	**-0.206**
Indonesia	**io4**	**-0.830**	**0.154**	**0.000**	**-1.132**	**-0.529**
	lde4	-0.791	0.797	0.321	-2.352	0.771
	kho4	**-0.169**	**0.064**	**0.008**	**-0.294**	**-0.045**
	cdyyo4	**1.142**	**0.219**	**0.000**	**0.713**	**1.570**
	kdbo4	0.038	0.034	0.269	-0.029	0.105
	_cons	**7.168**	**1.735**	**0.000**	**3.767**	**10.568**

Mexico	io5	0.026	0.104	0.804	-0.178	0.230
	lde5	-0.072	0.356	0.840	-0.769	0.625
	kho5	**0.076**	**0.029**	**0.008**	**0.020**	**0.133**
	cdyyo5	0.243	0.225	0.280	-0.198	0.683
	kdbo5	**-0.097**	**0.022**	**0.000**	**-0.141**	**-0.054**
	_cons	**2.678**	**0.481**	**0.000**	**1.736**	**3.620**
Russia	**io6**	**0.153**	**0.050**	**0.002**	**0.054**	**0.251**
	lde6	0.378	0.506	0.455	-0.613	1.370
	kho6	-0.019	0.023	0.418	-0.065	0.027
	cdyyo6	**0.690**	**0.063**	**0.000**	**0.566**	**0.813**
	kdbo6	**0.085**	**0.020**	**0.000**	**0.045**	**0.124**
	_cons	**-1.560**	**0.784**	**0.047**	**-3.096**	**-0.024**
Türkiye	io7	-0.086	0.057	0.134	-0.198	0.027
	lde7	**1.312**	**0.297**	**0.000**	**0.730**	**1.894**
	kho7	-0.054	0.037	0.140	-0.126	0.018
	cdyyo7	**3.833**	**0.677**	**0.000**	**2.506**	**5.160**
	kdbo7	-0.046	0.025	0.069	-0.095	0.004
	_cons	**2.274**	**0.837**	**0.007**	**0.633**	**3.915**

Table 10. Panel Results of the Robust SUR Model

	Independent variable	Coef.	Std. Err.	Calculated t Statistic	
PANEL	io	-1.87E-01	9.31E-02	**-2.00E+00**	The table value of t is 1.96 for α=0.05.
	lde	-1.31E-01	2.17E-01	**-6.06E-01**	
	kho	-2.77E-02	1.51E-02	-1.83E+00	
	cdyyo	9.00E-01	1.43E-01	**6.29E+00**	
	kdbo	-1.24E-02	1.05E-02	-1.18E+00	
	_cons	3.08E+00	4.82E-01	**6.39E+00**	

the kdbo ratio, the interaction, which was found to be significant for Brazil, India, Mexico and Russia, was not very high (not exceeding 10%). It is observed that when the short-term external debt ratio increases, the gddyo ratio decreases in Brazil and Mexico, but increases in India and Russia. Finally, the panel results are given in Table 10.

According to the panel findings in Table 9, the fact that the t statistic values calculated for io, lde and cdyyo variables are higher than the predicted table critical value indicates that the parameters obtained are significant at 95% confidence level. The aforementioned panel results also showed that the variable that had the most effect on the gdyyo variable was cdyyo. It was concluded that the increases in the unemployment rate and liberal democracy index had a negative effect on the GDP. The lowest effect coefficient was determined for the unemployment rate.

CONCLUSION AND RECOMMENDATIONS

E7 countries, which draw attention as economies with high growth rates, have been the subject of much research to predict their possible positions in the world economy and to reveal the sources of said rise. As a matter of fact, in addition to high growth rates, technological breakthroughs, increasing trade volumes, financial development levels and high population rates in the countries in question were effective in selecting the study sample. It may also be useful to reveal the view of FDIs, which have become one of the indispensable elements of globalization, specific to the relevant country group, to shed light on macroeconomic performance evaluations. In the study, the SUR estimator, which is the one of heterogeneous panel data models, was used to measure the effect of the unemployment rate, liberal democracy index, public expenditures, net foreign direct investment outflows, and short-term debts on net FDI inflows of E7 countries in the 1992-2021 period.

When the findings obtained are evaluated in general, it is remarkable that the variable that has the most impact on foreign direct investments entering the country is the investments leaving that country. It should also be noted that the finding that outbound foreign direct investments increase the amount of inbound investment is accepted for all statistically significant parameters. When the aforementioned result is evaluated as an indicator of foreign direct investment activity in the country, it is possible to say that a result in line with economic expectations has been reached. The second variable with a high level of influence was the liberal democracy index. However, in the results reached, it has been determined that a reverse effect mechanism works for Brazil- in other words, as the liberal democracy index increases, the gdyyo decreases. This situation may arise from the constraints that foreign investors must comply with. In this country, characterized by a presidential republic system, the prevalence of autocratic structures signifies an environment where substantial investment incentives are often extended, contingent upon the fragility of the government-voter rapport. Consequently, one might anticipate that rising democratization tendencies could exert a detrimental impact on FDI. On the other hand, it is possible to say that the increase in the liberal democracy index affects the gdyyo variable positively, and for Türkiye, it is related to the environment of trust that has emerged as a result of democratization developments. According to the findings regarding the unemployment rate variable, India and Russia were the countries where FDI inflows were positively affected, while Indonesia was the only country that was negatively affected. This result may be due to the low quality of the labor force in Indonesia, or the low opportunity cost that investors face in terms of the labor force. The observed positive correlation between India and Russia can be explained by the decreased labor expenses stemming from escalating unemployment, expanding available workforce, and appealing incentive policies.

While the coefficient results regarding the increase in the influence of the public on FDI are positive for India and Mexico, it is negative for Indonesia. The positive correlation observed may originate from heightened public expenditures directed towards critical sectors attractive to foreign investors, such as infrastructure, energy ventures, and telecommunications networks. Moreover, the resultant surge in demand could enhance economic growth and foster a conducive environment, thus paving the way for fresh investment prospects. Conversely, the adverse relationship noted for Indonesia underscores the reflection of its underlying economic challenges. Infrastructure gaps, hefty external debts, income inequality, inflationary pressures, bureaucratic hurdles, and corruption stand as prominent issues. Consequently, the demand surge triggered by increased public spending may fuel cost escalations, exacerbating inflationary strains. Furthermore, political instability and burgeoning budget deficits might signal a disconcerting climate for foreign investors, rather than instilling confidence amidst amplified public expenditures. Finally, while the findings of short-term debt burden are negative in Brazil and Mexico, it is positive for India and Russia. The negative results are thought to stem from heightened debt burdens, triggering perceptions of risk, concerns regarding stability, financial constraints and escalating costs. When the aforementioned findings are evaluated for the economies of India and Russia, it is possible to say that the findings of these two countries, which attract high levels of FDI, can provide evidence that the short-term debt burden does not constitute an obstacle for foreign investments.

The most striking situation in all the results obtained is that there was no statistically significant interaction within the scope of the variables examined in the Chinese economy, which has the highest level of FDI inflows. Although China has many features that are attractive for both qualified and cheap labor and FDIs, a finding that is in line with expectations could not be obtained. Research on the determinants of foreign investment inflows in the Chinese economy especially highlights that the significant presence of investments from OECD countries, attributed not only to the vast domestic market but also intensive trade relationships. Likewise, the Indian economy attracts foreign investors with factors like low labor costs, geographical advantages, cultural alignment with OECD countries and low country risk (Wei, 2005). For this reason, it is planned to analyze the main determinants of the Chinese economy, especially based on a single country, for further studies.

Given this information, it is possible to apply the modeling conducted in the study to countries where FDI outflows are common. Furthermore, spatial econometric analyses focusing on the geography factor are believed to provide guidance. Finally, it is advisable to examine studies on the determinants of FDI outflows, which have proven to be highly effective, particularly within the context of dynamic models.

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