

# Are Development Goals Enough to Attract Foreign Direct Investment?

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**Abstract:** This study investigates whether development goals contribute to economic growth in countries with the highest share of foreign direct investment in the world economy. It is concluded that there is cross-sectional dependence and unit root at level value in foreign direct investment, gross domestic product and sustainable development index. Since there is a long-run relationship in the model, a panel vector error correction model is constructed. In the short run, there is no causality from gross domestic product and sustainable development index to foreign direct investment. However, in the long run, such causality is obtained. On a country basis, there is causality from Sustainable Development Goals to FDI in Estonia, Finland and Germany. In Japan, Poland, Colombia, Latvia, Finland and Slovak Rep. there is causality from Gross Domestic Product to FDI. These findings suggest that long-term strategic planning and development goals play a critical role in attracting foreign capital. Moreover, analyzing the effects of different countries' emphasis on development goals and economic structures on foreign capital attraction provides important clues for future policy-making processes.

**Keywords:** Foreign Direct Investment, Sustainable Development Index, Panel Data

**Jel Codes:** C23, F21, O11

## *Kalkınma Hedefleri Doğrudan Yabancı Sermaye Yatırımlarını Çekmek için Yeterli Mi?*

**Öz:** Bu çalışmada, dünya ekonomisinde doğrudan yabancı sermaye yatırımlarından en yüksek payı alan ülkelerde kalkınma hedeflerinin ekonomik büyümeye katkı sağlayıp sağlamadığı araştırılmaktadır. Doğrudan yabancı sermaye yatırımları, gayrisafi yurtiçi hasıla ve sürdürülebilir kalkınma endeksinde yatay kesit bağımlılığı ve düzey değerinde birim kök olduğu sonucuna ulaşılmaktadır. Modelde uzun dönemli ilişki bulunması nedeniyle panel vektör hata düzeltme modeli kurulmuştur. Kısa dönemde gayrisafi yurtiçi hasıla ve sürdürülebilir kalkınma endeksinde doğrudan yabancı sermaye yatırımlarına doğru nedensellik bulunmamaktadır. Ancak uzun dönemde bu nedensellik elde edilmektedir. Ülke bazında ise Estonya, Finlandiya ve Almanya'da sürdürülebilir kalkınma hedeflerinden doğrudan yabancı sermaye yatırımlarına doğru nedensellik bulunmaktadır. Japonya, Polonya, Kolombiya, Letonya, Finlandiya ve Slovakya'da gayrisafi yurtiçi hasıladan doğrudan yabancı sermaye yatırımlarına doğru nedensellik bulunmaktadır. Bu bulgular, uzun vadeli stratejik planlamaların ve kalkınma hedeflerinin yabancı sermaye çekmede kritik bir rol oynadığını göstermektedir. Ayrıca, farklı ülkelerin kalkınma hedeflerine verdikleri önemin ve ekonomik yapılarının, yabancı sermaye çekme üzerindeki etkilerinin analiz edilmesi, gelecekteki politika oluşturma süreçleri için önemli ipuçları sunmaktadır.

**Anahtar Kelimeler:** Doğrudan Yabancı Yatırım, Sürdürülebilir Kalkınma Endeksi, Panel Data

**Jel Kodları:** C23, F21, O11

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## 1. Introduction

Economic development can be defined as the attainment of a higher position on the international economic stage and the consequent increase in living standards. This process is an evolution of mutually interacting structural changes in the economic, social, political,

cultural and technological spheres. It is anticipated that fundamental requirements for economic development will ultimately be met, including sustained growth, a structural shift in the patterns of manufacturing and consumption, technological advancement, organizational, social, and political modernization, and an overall rise in quality of life (Yeldan, 2002, p.24).

Foreign capital inflows are linked to factors such as market demand, structural growth and industrialization, as well as tax incentives. Tax incentives are important instruments that support the rapid development of economic activity. Investment incentives were initially used to encourage entrepreneurs in developing countries, but over time they have served the purpose of attracting foreign capital. Tax incentive policies are shaped by each country's priorities and are constantly under review. For example, in Turkey, various tax incentive policies have been intensively implemented since the late 1960s and especially after the 1980s, and these policies have undergone changes over time. Finally, the effects of the Law No. 5084, in addition to contributing to the national economy, have led to some controversies and required adjustments (Birsev, Ö. 2011,2:3).

The study investigates the assistance of development goals to economic growth in countries with the highest share of foreign direct investment in the world economy. The study focuses on the period between 2000 and 2020 and examines the relationship between gross domestic product (lnGDP) and Sustainable Development Goals (lnSDG) with the impact of foreign direct investment (lnFDI). The countries selected for the investigation are Australia, Austria, Belgium, Canada, Chile, Colombia, Costa Rica, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Republic of Korea, Latvia, Lithuania, Mexico, Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States. Accordingly, horizontal cross-section dependence, unit root test, and co-integration test were applied in the analysis section. Since there is a long-run association in the model, a panel vector error correction model was established, followed by a causality test.

## 2. Literature Review

**Table 1.** Literature Review

Author(s)	Period	Method	Conclusion
Özcan, Mert Efe (2014)	1980-2012	Johansen Co-integration test and Granger Causality test	The outcomes of the research provided a comprehensive analysis to understand the influences of FDI on the Turkish economy. The analysis revealed a cointegration relationship between FDI and Turkey's GDP, total investment, and trade openness. However, a unidirectional causality was found from GDP to FDI, while no significant causality was found among other variables.
Koyuncu, Fatma Turan (2010)	1990-2009	Structural Var analysis	The findings show that different nations have different factors influencing FDI inflows. The results show that changes in net international reserves, trade openness, GDP, and the quantity of FDI received in the preceding period all have a substantial impact on FDI inflows. Therefore, FDI inflows in Turkey are affected by the previous level of foreign direct investment and relations with global markets.
Hazman, G. G. (2010)	1980-2007	Toda-Yamamoto Causality Model	As a consequence of the study, no bidirectional causality association was discovered between FDI and incentive certificates. There is no causality between incentive certificate and foreign direct investments. These findings suggest that incentive certificate implementation does not have a strong impact on foreign investors.
Muhsin Kar, Fatma Tatlısöz (2008)	1980-2003	Econometric analysis (EKK Method)	The analysis revealed a favorable correlation among foreign direct investment (FDI) and incentives for investment, as well as the gross national product, openness rate, index of power production, and internationally net reserves. However, there is a negative correlation between labor costs, foreign direct investment, and the actual rate of exchange. As a result, the diversity and complexity of the factors affecting FDI in Turkey are emphasized.
Awolusi et. al.	1980-2013	Granger Causality Test	The dependent variable, FDI inflows, has been expressed by a percentage of FDI flows to GDP, while the causes of FDI inflows were quantified using Anyanwu's five dimensions. The results showed that FDI flows to these continents are benefited by the variables that identify the factors influencing FDI inflows. They concluded that economic stability increases foreign direct investment.
Şaşmaz, Yayla (2018)	2000-2016	Panel data analysis	The present research examines the relationship during economic development and foreign direct investment (FDI) in 34 nations that belong to the OECD during 2000 and 2016 using the Panel data analyses method. The results demonstrate a favorable correlation between economic progress and foreign direct investment (FDI).
Durgan (2016)	2001-2012	Panel data analysis	The analyses were conducted by identifying the countries that invest the most in Turkey and evaluating the relations with these countries in depth. The results show that besides the impact of geographical distance on foreign capital flows, neighborhood relations also play a crucial role. In particular, the intensity of investments between neighboring countries and historical ties are found to be the determining factors affecting FDI flows. These findings provide an important framework to better understand their impact on Turkey's international investment strategies.
Zengin et al. (2018)	1988-2015	Multivariate Adaptive Regression Splines	The study shows that foreign direct investments and the current account deficit issue are inversely related. When the current account deficit to GDP ratio exceeds a certain level, FDI decreases. These findings indicate that foreign investors have reservations about choosing Turkey.
Lucke and Eichler (2016)	1995-2009	Panel data analysis	The findings show that FDI frequently has a regional component, with stable politics serving as its primary indicator, and that institutional and cultural distinctions are significant.
Castellani, Meliciani and Mirra (2016)	2003-2008	Regression Analysis	Utilizing information from 146 NUTS-2 regions, it is discovered that areas with a manufacturing focus—which makes heavy use of business services—are the ones that draw in greater foreign direct investment (FDI) in the business field of services. Foreign investors are shown to be impacted by government policy.

## 3. Empirical Results

The influence of the Sustainable Development Goals (SDG) and the gross domestic product (GDP) on foreign direct investment (FDI) between 2000 and 2020 is examined in this study. The countries that are included are: Australia, Austria, Canada, Belgium, Chile,

Colombia, Costa Rica, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Rep., the Republic of Latvia, Lithuania, Mexico, Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the US. These countries attract 80% of total foreign direct investment. The World Bank and United Nations databases are the sources of the data.

**Table 2.** Horizontal-section Dependence and Heterogeneity Tests

Model with constants	lnFDI		lnGDP		lnSDG	
	Statistic	p-value	Statistic	p-value	Statistic	p-value
$CD_{lm}$ (BP,1980)	1791.742	0.00***	747.432	0.00***	818.508	0.00***
$CD_{lm}$ (Pesaran, 2004)	32.728	0.00***	3.308	0.00***	5.311	0.00***
$CD_{\square}$ (Pesaran, 2004)	17.623	0.00***	-2.985	0.00***	-3.196	0.00***
$LM_{adi}$ (PUY, 2008)	8.445	0.00***	-0.305	0.62	-0.915	0.82
Cross-section dependency tests:						
$LM$ (BP,1980)	3190.334	0.00***				
$CD_{lm}$ (Pesaran, 2004)	72.129	0.00***				
$CD_{\square}$ (Pesaran, 2004)	15.474	0.018**				
$LM_{adi}$ (PUY, 2008)	96.015	0.00***				
Homogeneity tests:						
$\tilde{\Delta}$	5.362	0.00***				
$\tilde{\Delta}_{adj}$	5.844	0.00***				

**Notes:**  $\Delta y_{i,t} = d_i + \delta_i y_{i,t-1} + \sum_{j=1}^{p_i} \lambda_{i,j} \Delta y_{i,t-j} + u_{i,t}$  In the model, the number of delays ( $p_i$ ) is taken as 1. Probabilities are in parentheses. \*\*\*, \*\*, and \* denote statistical significance at the 1, 5, and 10% level of significance, respectively.

The countries that make up the panel have a horizontal cross-sectional dependency based on the probability values based on the factors. A similar situation is also observed in terms of regression. Finally, the slope parameters of the panel countries are different from each other. The alternative hypothesis in the Bai and Ng (2004) PANIC panel unit root test is that the series does not have a unit root, while the null hypothesis is that the series has a unit root.

**Table 3.** PANIC Panel Unit Root Test

Levels	Constant		Constant and Trend	
	Statistic	p-value	Statistic	p-value
lnFDI				
$\mathcal{L}_{\hat{\epsilon}}$	-1.5989	0.945	2.4571	0.00***
$\mathcal{I}_{\hat{\epsilon}}$	52.8137	0.956	101.4854	0.012**
lnGDP				
$\mathcal{L}_{\hat{\epsilon}}$	10.9142	0.00***	8.2275	0.00***
$\mathcal{I}_{\hat{\epsilon}}$	202.9698	0.00***	170.7302	0.00***
lnSDG				
$\mathcal{L}_{\hat{\epsilon}}$	1.9837	0.023**	4.3341	0.00***
$\mathcal{I}_{\hat{\epsilon}}$	95.8039	0.031**	124.0096	0.00***
<b>First difference</b>				
lnFDI				
$\mathcal{L}_{\hat{\epsilon}}$	11.1186	0.00***	8.7073	0.00***
$\mathcal{I}_{\hat{\epsilon}}$	205.4236	0.00***	176.4873	0.00***
lnGDP				
$\mathcal{L}_{\hat{\epsilon}}$	17.2007	0.00***	15.8313	0.00***
$\mathcal{I}_{\hat{\epsilon}}$	278.4082	0.00***	261.9757	0.00***
lnSDG				
$\mathcal{L}_{\hat{\epsilon}}$	15.1575	0.00***	12.5358	0.00***
$\mathcal{I}_{\hat{\epsilon}}$	253.8896	0.00***	222.4293	0.00***

$P_{\hat{\epsilon}}^c$  is a Fisher's type statistic that is determined by the p-values of each ADF test. is a large N sample standardized Choi's type statistic. Two is considered the maximum number of common components. In parenthesis are the probabilities. At the 1, 5, and 10% levels of significance, respectively, the symbols \*\*\*, \*\*, and \* indicate statistical significance.

In the model, the unit root of the lnFDI variable is constant at the level value. The model with constant and trend at the level value does not have a unit root issue. At the 1% level of significance, the lnGDP parameter is stable in both the tended and fixed models. The lnSDG parameter is stable at the 1% and 5% levels of significance in the trended models and the fixed approach, respectively. Therefore, given that the data exhibits long memory, the Panel VAR model will assume that the lnFDI variable is stationary at the initial difference of I(1), while the remaining variables are stable at the level value of I (0).

**Table 4.** Panel Cointegration Tests

Tests	Constant			Constant and Trend		
	Statistic	Asymptotic p-value	Bootstrap p-value	Statistic	Asymptotic p-value	Bootstrap p-value
Error Correction (Ho:no cointegration)						
Group_tau	-32.827	0.00***	0.00***	-33.104	0.00***	0.00***
Group_alpha	-12.729	0.00***	0.00***	-14.352	0.00***	0.00***
Panel_tau	-20.718	0.00***	0.062*	-20.999	0.00***	0.134
Panel_alfa	-13.439	0.00***	0.203	-14.019	0.00***	0.151
LM bootstrap (Ho: cointegration)						
$LM_N^+$	0.212	0.99	0.416	7.132	0.674	0.00***

Lag and prior are taken as one in the Error Correction test. Values for the bootstrap probability come from a distribution that has 1,000 replications. Values of asymptotic probability are derived from the conventional normal distribution.

Heterogeneous estimation-based cointegration techniques that account for horizontal cross-section dependency are applied. The alternative hypothesis in the ECM test is cointegration, while the null hypothesis is that there is no cointegration. In the bootstrap panel alpha test statistic for the constants model as well as in the panel tau and panel alpha test statistics for the constants and trend model, the null hypothesis is accepted. The alternative hypothesis in the Lm bootstrap cointegration test is that there is no cointegration, whereas the null hypothesis is that there is cointegration between the variables. In the model with constant and trend, the alternative hypothesis is accepted at 1% significance level according to the bootstrap probability value. A thorough investigation has revealed a long-term relationship among lnFDI, lnGDP, and lnSDG. The statistically important error correction coefficients in the Panel VECM panel correction model for errors and the short-run causality in the Panel VAR panel error correction model demonstrate long-term causation from independent factors to the dependent variable as a whole. The null hypothesis states that there is no causality, whereas the alternative hypothesis claims that there is.

**Table 5.** Panel VAR and Panel VECM Causality

	Short-run causality			Long-run causality
	$\Delta$ (lnFDI)	$\Delta$ (lnGDP)	$\Delta$ (lnSDG)	ECT(-1)
$\Delta$ (lnFDI)	-	116.671 (0.00)***	4.092 (0.251)	-0.310 [-8.585]***
$\Delta$ (lnGDP)	2.036 (0.564)	-	3.129 (0.372)	0.141 [7.646]***
$\Delta$ (lnSDG)	4.897 (0.174)	6.403 (0.093)*	-	0.0015 [1.267]

Notes: The numbers \*\*\*, \*\*, and \*, respectively, represent the 1%, 5%, and 10% levels. The probability value is displayed by() and the t statistics are displayed by []. In the decision-making phase, the t statistic for PVECM long-run causality (2.57 for 1%, 1.96 for 5%, and 1.64 for 10%) and the prob value for PVAR short-run causation are employed.

There is no causal relationship between lnGDP and lnFDI or lnSDG and lnFDI in the near term. There is a 10% an significance level of causation from lnSDG to lnGDP and a one percent level of causality from lnFDI to lnGDP in the near term. Those imbalances that surfaced in the short run are fixed again in about 3.22 years, based on a long-run error correction coefficients, which is considered statistically significant at the 1% level of significance in the model using lnFDI as the variable that depends. Moreover, there is causality from lnGDP and lnSDG to lnFDI as a whole in the long run.

Again, in the model where lnGDP is the independent variable and lnFDI and lnSDG are the independent variables in the long run, the imbalances that arise in the short run are corrected again in about 7 years. According to this model, there is causality from lnFDI and lnSDG to lnGDP in the long run as a whole.

**Table 6.** Emirmahmutoğlu and Köse (2011) Panel Causality

Country	Lag	lnFDI $\neq$ lnGDP	p-value	lnGDP $\neq$ lnFDI	p-value
Australa	2	5.943	0.051*	0.977	0.613
Austria	2	14.132	0.00***	3.450	0.178
Belgium	1	5.065	0.024**	0.176	0.674
Canada	1	8.125	0.00***	0.062	0.803
Chile	3	16.327	0.00***	6.126	0.105
Colombia	1	0.1534	0.695	3.897	0.048**
Costa Rica	2	2.022	0.363	1.395	0.497
Czechia	3	39.506	0.00***	6.097	0.106
Denmark	1	6.172	0.012**	0.743	0.388
Estonia	3	11.769	0.00***	1.366	0.713
France	3	10.614	0.014**	2.046	0.562
Germany	3	26.261	0.00***	4.503	0.211
Finland	3	5.411	0.144	11.618	0.00***
Greece	2	0.907	0.635	0.336	0.845
Hungary	3	26.295	0.00***	1.836	0.607
Iceland	3	4.468	0.215	6.442	0.091*
Ireland	1	0.0736	0.786	1.535	0.215
Israel	3	22.300	0.00***	1.185	0.756
Japan	1	1.171	0.279	2.949	0.085*
Korea Rep.	2	13.245	0.00***	2.520	0.283
Latvia	3	11.010	0.011**	8.898	0.0306**
Lithuania	2	33.842	0.00***	2.221	0.329
Mexico	2	5.523	0.063*	1.189	0.551
Netherlands	1	0.3104	0.577	0.348	0.555
Norway	2	13.721	0.00***	1.125	0.569
Poland	3	8.432	0.037**	7.434	0.059*
Portugal	2	4.654	0.097*	1.939	0.379
Slovak Rep.	3	38.324	0.00***	1.109	0.774
Slovenia	3	6.610	0.083*	18.392	0.00***
Italy	3	24.305	0.00***	4.954	0.175
Spain	2	4.873	0.087*	0.291	0.864
Sweden	3	20.013	0.00***	1.169	0.760
Switzerland	2	3.013	0.221	0.603	0.739
Türkiye	2	7.047	0.029**	5.7196	0.057*
UK	3	26.977	0.00***	2.872	0.411
USA	3	21.590	0.00***	4.134	0.247
Panel		419.565	0.00***	107.354	0.00***

The percentages represented by the numbers \*\*\*, \*\*, and \* are 1%, 5%, and 10%, respectively. The probability value is displayed by () and the t statistics are displayed by [].

There is causality from lnFDI to lnGDP at the 10% level of significance in Australia, Portugal, Slovenia, Spain, Belgium, Denmark, France, Latvia, Poland, Turkey at the 5% level of significance in Austria, Canada, Chile, Czechia, Estonia, Germany, Hungary, Israel, Italy, Korea Rep, Lithuania, Norway, Slovak Rep, There is causality from lnGDP to lnFDI in Japan, Poland at 10% level of significance, Colombia, Latvia at 5% level of significance, Finland and Slovak Rep. at 1% level of significance. Since there is no causality between lnFDI and lnSDG for the whole panel, it is not possible to examine the causality relationship on country basis.

**Table 7.** Emirmahmutoğlu and Köse (2011) Panel Causality

Country	Lag	lnFDI $\Rightarrow$ lnSDG	p-value	lnSDG $\Rightarrow$ lnFDI	p-value
Australia	1	0.093	0.759	0.039	0.843
Austria	1	0.0008	0.976	0.253	0.614
Belgium	1	0.960	0.326	0.372	0.541
Canada	3	2.047	0.562	2.219	0.528
Chile	3	1.056	0.787	4.874	0.181
Colombia	1	0.032	0.856	0.561	0.453
Costa Rica	2	1.936	0.379	0.577	0.749
Czechia	1	0.123	0.725	2.475	0.115
Denmark	1	0.045	0.831	0.056	0.812
Estonia	3	2.098	0.552	18.226	0.00***
Finland	3	6.798	0.078*	8.207	0.041**
France	2	1.230	0.540	0.485	0.784
Germany	2	0.609	0.737	10.950	0.00***
Greece	2	1.810	0.404	0.363	0.833
Hungary	1	0.011	0.915	0.078	0.779
Iceland	2	7.788	0.020**	0.061	0.969
Ireland	2	5.387	0.067*	0.0522	0.974
Israel	3	4.856	0.182	1.951	0.582
Italy	1	1.521	0.217	0.644	0.421
Japan	1	0.223	0.636	0.000	0.983
Korea Rep.	3	9.816	0.020**	2.959	0.397
Latvia	2	9.199	0.010**	1.1607	0.559
Lithuania	2	6.303	0.042**	2.902	0.234
Mexico	1	7.77E-05	0.992	0.304	0.580
Netherlands	1	0.003	0.952	0.193	0.660
Norway	2	2.035	0.361	0.083	0.958
Poland	1	0.044	0.832	1.364	0.242
Portugal	3	3.041	0.385	0.562	0.904
Slovak Rep.	3	0.303	0.959	1.378	0.710
Slovenia	2	3.069	0.215	1.236	0.538
Spain	2	1.884	0.389	1.415	0.492
Sweden	3	3.729	0.292	0.923	0.819
Switzerland	2	0.345	0.841	2.146	0.341
Türkiye	2	1.173	0.556	0.640	0.726
UK	1	0.565	0.452	0.426	0.513
USA	1	0.413	0.520	0.008	0.926
Panel		77.992	0.294	70.337	0.533

The percentages represented by the numbers \*\*\*, \*\*, and \* are 1%, 5%, and 10%, respectively. The probability value is displayed by () and the t statistics are displayed by [].

There is causality from FDI to Sustainable Development Goals in Finland, Iceland, Ireland, Korea Rep., Latvia, Lithuania. There is causality from Sustainable Development Goals to FDI in Estonia, Finland and Germany.

#### 4. Conclusion

This study supplies an in-depth analysis of the impact of FDI on development goals in the global economy. The results show that FDI has a significant impact on critical indicators such as gross domestic product (GDP) and the sustainable development index (SDI).

Panel data analysis reveals the presence of a strong association between FDI, GDP, and SDG in the long run. This relationship emphasizes the interplay between economic growth and sustainable development. A country-by-country analysis reveals that in some countries, SDG targets have been a driver of FDI, suggesting that sustainable development has become increasingly important for investors. On the other hand, in some countries, economic growth is found to be a determining factor in attracting FDI.

Moreover, it is found that short-run imbalances are corrected over time and that there is a mutual causality association between economic growth, sustainable development,

and FDI in the long run. This emphasizes the importance of understanding and managing the long-term effects of economic policies.

In conclusion, the study makes an important contribution to the global economic development and sustainability debate. Such analyses on the impact of FDI on economic growth and sustainable development goals are expected to guide policymakers, investors, and academics in making strategic decisions.

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