The Geography of Growth: Regional Disparities and the Human Capital-FDI Nexus in Europe

Andreea-Raluca MOCANU
https://orcid.org/0009-0000-4569-7276
Doctoral School of Finance
Bucharest University of Economic Studies, Bucharest, Romania
mocanuandreea16@stud.ase.ro

Alessandro GIANNOZZI
https://orcid.org/0000-0002-1036-9798
Department of Economics and Management
University of Florence, Florence, Italy
alessandro.giannozzi@unifi.it

Abstract

This study investigates the impact of Foreign Direct Investment (FDI) on economic growth across diverse European regions from 2000 to 2023. The analysis into Northern, Central/Eastern, and Southern Europe, the research identifies how structural and socio-economic disparities moderate the FDI-growth relationship. Utilizing Panel Least Squares and Panel EGLS regression models, the findings indicate a robust positive correlation between FDI and GDP growth in Northern and Central/Eastern Europe, while revealing a statistically insignificant impact in the Southern region. A central contribution of the paper is the identification of a "Human Capital Threshold," demonstrating that higher education levels significantly amplify the positive spillovers of FDI. The results suggest that for transitional and emerging European economies, investment in human capital is a prerequisite for translating foreign capital inflows into sustainable economic development. The study provides a regional roadmap for structural reforms aimed at enhancing investment absorptive capacity.

Introduction

European economies present significant differences determined by their geographical position, level of development and capacity to attract foreign direct investment. Northern European countries stand out for their economic stability, solid institutions and moderate growth, typical of mature economies. In Central and Eastern Europe, the growth rate is faster, supported by convergence processes and foreign investment attracted by competitive costs

and proximity to Western European markets. In contrast, Southern Europe faces slower growth, influenced by structural vulnerabilities, but is making progress because of economic reforms and European support. Thus, the comparative analysis of these three regions highlights how the geographical position and the stage of economic maturity determine significant differences in growth dynamics and foreign investment flows, providing a perspective on the process of convergence and cohesion at European level.

The majority of studies indicate the growth-enhancing role of foreign direct investment. Researchers such as Minh & Trinh (2023), Dua & Verma (2024), Bieleń et al. (2024), Arbia & Sobhi (2024), Haini et al. (2024), Sha (2023), and Bilas (2020) have demonstrated, across different groups of countries, that the significance of foreign direct investment is mirrored in the trajectory of a country's economic growth. Their findings also suggest that this positive impact is more pronounced in regions with higher levels of human capital, stronger institutional frameworks, and greater absorptive capacities, though its magnitude can vary according to regional characteristics and long-term conditions. For these benefits to be fully realized, the entire economic context of the host country must support investment. As an innovative aspect, this study incorporates variables that simultaneously influence economic performance and foreign direct investment inflows, focusing specifically on education and health expenditures, factors that have not been extensively analysed in previous international research within this framework. This research therefore aims to address several gaps in the existing literature. While most prior studies have primarily examined macroeconomic indicators such as exports, imports, trade openness, or inflation, the potential role of social development factors, including education and health, has received limited attention. Furthermore, whereas earlier research typically focused separately on either developed or developing countries, this study adopts a comparative approach covering nations at diverse stages of economic and social development.

This paper provides an original contribution to the literature by employing a comparative regional approach to explore the FDI-growth nexus across European economies. Unlike many prior studies that focus on national-level analyses or countries with similar developmental profiles, this research differentiates between Northern, Central and Eastern, and Southern Europe, capturing key structural and institutional variations across regions. The novelty of this study also lies in incorporating education and health expenditures as critical components of human capital that shape the FDI-growth nexus. By integrating these social development factors, the paper offers a deeper insight into how FDI influences regional economic convergence and investment attractiveness in Europe.

This research primarily seeks to evaluate how foreign direct investment affects growth outcomes for 27 European countries, divided into three regional groups based on their geographic location: Northern Europe, Central and Eastern Europe, and Southern Europe, covering 2000–2023. The real GDP growth rate is considered the dependent variable in the analysis, while foreign direct investment serves as the main independent variable. The study further introduces exogenous factors related to education and health as key determinants in the investment-growth relationship, underlining their role in attracting FDI depending on a country's geographic position. It is expected that higher educational attainment enhances a country's appeal for foreign investors by creating a favourable investment climate, improving workforce quality, fostering innovation and research, and boosting productivity. Additional control variables, including economic openness and employment rate, are incorporated based on previous literature to account for other factors influencing growth.

Empirical results obtained from Panel Least Squares and Panel EGLS regression models, considering fixed-effects (cross-section weights) as well as random-effects (cross-section random effects), indicate that foreign direct investment exerts a statistically significant positive effect on economic growth in Northern and Central and Eastern European countries, while its impact is not significant in Southern Europe. Education consistently demonstrates a positive and statistically significant effect on growth across all regional groupings, confirming its importance in attracting investment. Health expenditure is also statistically significant and is used as a proxy for the countries' overall level of economic development.

This study advances existing research in several ways. First, it provides a novel regional-level perspective on the effects of FDI within Europe, moving beyond national-level analyses and enabling a more nuanced understanding of regional economic dynamics. Second, by including education and health expenditures as moderating variables, it offers fresh insights into how human capital and public investment shape the connection between foreign investment and growth. In doing so, the paper addresses gaps in the literature and delivers a more comprehensive understanding of the mechanisms linking FDI to regional economic performance.

The paper is organized into four main sections. The literature review summarizes previous research and outlines the theoretical foundations, the research methodology and variables section presents the empirical approach and definitions of key variables, the database and empirical evidence section describes the data and reports the findings, and the concluding remarks and future directions section highlights the main results and suggests avenues for further research. The paper therefore begins with a review of the literature, providing the context and rationale for the study.

1. Research Background

In the era of digitalization, innovation and transformation, researchers grant particular importance to foreign investments, considering that without them, less developed countries may struggle to achieve growth, while even developed economies risk stagnation. In the specialized literature, foreign direct investment is consistently identified as a significant contributor to economic development in the host country, with the majority of studies emphasizing its predominantly positive impact on productivity, capital accumulation, and technological advancement.

Foreign capital inflows and their role in economic development have been examined in numerous empirical studies across different regions and periods. Minh and Trinh (2023) examined 60 developing countries over 1995–2019, finding that FDI positively affects economic growth, although the magnitude of this effect may depend on a specific threshold of investment. Their study also highlighted that trade openness serves as a key absorption factor, as the growth-stimulating impact of FDI is significant only when countries have sufficient trade integration. Similarly, Dua & Verma (2024) analysed 71 emerging and developing economies from 2000 to 2019, demonstrating that economies with higher levels of financial development experience stronger growth effects from FDI.

Bieleń et al. (2024) explored the effects of FDI and trade openness on economic growth in Central and Eastern Europe as well as West Africa during 1995–2022. Evidence suggests that both FDI and trade openness support the long-term growth in West African countries, whereas in Central and Eastern Europe, investment alone drives growth. Bilas (2020) focused on the 13 newest EU member states between 2002–2018 and found limited evidence of a statistically significant FDI-growth nexus in that context. Sha (2023) studied G7 economies from 2000–2020, demonstrating that FDI, trade openness, financial development, and technological innovation collectively foster economic growth in these countries.

Le et al. (2024) investigated 90 middle-income countries over 1990–2020 and concluded that increases in FDI enhance growth in these economies. Lam Ho et al. (2024) examined both developed and developing Asian countries between 1996–2019, highlighting a long-term equilibrium among growth, investment, and trade openness. However, the study also noted that greater investment and trade openness may exacerbate environmental degradation in developing countries through increased income and CO_2 emissions. Hakim and Budi (2024) analysed ASEAN nations from 2000–2021, finding a positive impact of FDI on economic growth, which was reinforced by Phung et al. (2023) in their study of 11 Southeast Asian economies from 2000–2018. Their results suggested that FDI promotes green growth, with stronger effects in countries reaching higher levels of fiscal development. Haini et al. (2024) similarly confirmed positive and significant FDI impacts on growth across 10 ASEAN countries between 1995–2022.

Research on African and MENA regions also provides insights. Hassen and Anis (2012) examined Tunisia from 1975–2009, showing cointegration among economic growth, FDI, human capital, and trade openness, with both short- and long-term positive effects of FDI. Szkorupová (2014) found long-term causal relationships between growth, FDI, and exports in Slovakia during 2001–2010. Arbia & Sobhi (2024) analysed North African countries from 1995–2021, confirming significant positive contributions of FDI to growth. Abdallah (2024) studied 15 MENA countries (1990–2012) and found that both FDI and trade openness accelerate long-term growth. Rajab & Zouheir (2023) explored 15 African countries with the lowest levels of development from 2000–2019, revealing that FDI positively affects growth when combined with human capital, although labor shortages may limit potential benefits. Sunde (2017) analysed South Africa (1990–2014) and identified unidirectional causal effects from FDI to growth and exports, as well as bidirectional causality between growth and exports.

Studies focusing on South and South-East Asia reveal complex dynamics. Alam et al. (2024) investigated India from 1991–2019, finding that FDI has a nonlinear effect: increases in investment boost growth, while decreases hinder it. Kumari et al. (2023) confirmed bidirectional causality between growth and FDI in India (1985–2018). Malik & Sah (2024) examined BRICS countries over 1991–2020, reporting positive short-term FDI effects on growth but weak long-term links. Mawutor et al. (2023) studied Ghana (1980–2018) and found negative effects of FDI, imports, and exchange rate on growth, while remittances positively contributed in both the short and long term. Mustafa (2023) analysed four South Asian countries (1990–2019), revealing heterogeneous patterns: unidirectional causal effect of economic growth on FDI in India and Pakistan, from FDI to growth in Sri Lanka, and no significant links in Bangladesh.

In conclusion, based on the literature review evidence, the assumption of current paper is that the foreign direct investment represents one of the most relevant engines of economic growth, positively influencing it and bringing advantages in terms of foreign capital, technological transfer, job opportunities, labour force training, international management culture and market competition. Additional key variables highlighted in the literature are economic openness, representing trade integration and export importance, and the employment rate, indicating the contribution of human capital supporting growth.

2. Research Methodology

The empirical analysis employs a panel data econometric framework with the aim of studying the link between FDI and economic development. The estimations are conducted using the Panel Least Squares technique, considering fixed-effects as well as random-effects specifications, and are implemented using Stata 13 software. Economic growth is treated as the dependent variable, while foreign direct investment represents the core explanatory variable. In addition, several control variables commonly associated with growth dynamics are included, namely educational attainment, health expenditure, economic openness, and the employment rate.

To capture potential conditional effects, interaction terms between foreign direct investment and human capital variables are incorporated into the model. Specifically, the interaction between FDI and educational attainment (FDI × EDU_ATT), as well as between FDI and health expenditure (FDI × HEALTH_EXP), is tested in order to assess whether the growth effects of FDI depend on the level of education and health development in the host countries.

Following the panel data modelling approach outlined by Baltagi (2021), the general specification of the regression model can be expressed as:

$$y_{it} = \alpha + X'_{it} \beta + u_{it} \ , \ i = 1,...,N, \ t = 1,...,T, \tag{1}$$

where y_{it} denotes the dependent variable, X'_{it} represents the vector of explanatory variables, *α* is the intercept term, and u_{it} is the idiosyncratic error component varying across both cross-sectional units and time. The indices *i* and *t* correspond to the cross-sectional and temporal dimensions of the panel, respectively.

The appropriate specification of the models is determined using the Hausman test for each regression. The results indicate that the null hypothesis cannot be rejected for the regressions conducted on the Northern countries panel and the Central and Eastern European (CEE) countries panel, suggesting that the random-effects estimator is more suitable in these cases. Conversely, for the total panel and the Southern countries panel, the null hypothesis is rejected, implying that the fixed-effects specification provides more consistent estimates.

Table 1 presents the variables included in the empirical analysis, together with their notation and classification. Economic growth, expressed through the annual rate of GDP increase, is used as the dependent variable, while all remaining variables are treated as independent. All variables are expressed in percentage terms. The data are sourced from the World Bank database and cover the annual period from 2000 to 2023.

Table 1. Description of the Variables

Variables	Description	Type
GDP_G	GDP growth (annual %)	Endogenous
FDI	Foreign direct investment, net inflows (% of GDP)	Exogenous
EDU_ATT	Educational attainment, at least Bachelor's or equivalent, population 25+, total (%)	Exogenous
HEALTH_EXP	Current health expenditure (% of GDP)	Exogenous
EMP	Employment to population ratio, 15+, total (%) (national estimate)	Exogenous
EC_OPEN	Economic openness of the country (% of GDP)	Exogenous

Source: Authors' own processing based on World Bank data

The key variables of interest are economic growth (GDP_G) and foreign direct investment (FDI). Theoretical and empirical literature generally suggests a bidirectional relationship between these variables. On the one hand, higher economic growth enhances macroeconomic stability and improves investment prospects, thereby encouraging foreign capital inflows. On the other hand, foreign direct investment may enhance economic development through diverse channels, including technological spillovers, employment growth, export expansion, and increased capital accumulation.

The selection of the control variables aims to capture structural factors that influence both the attractiveness of countries for foreign investors and their capacity to transform FDI inflows into sustained economic growth. Educational attainment is included to reflect the quality of human capital, which is a critical determinant of productivity, innovation, and investment efficiency. Health expenditure is used as a proxy for the overall level of socioeconomic development and the capacity of the workforce to contribute effectively to economic activity.

Employment-to-population ratio is incorporated to account for labour market conditions and the extent to which available human capital is utilized within the economy. Higher employment levels are expected to be associated with improved productivity and stronger growth performance. Economic openness is included to reflect the extent of worldwide economic integration, which eases access to global markets and external capital, and advanced technologies, which may further enhance economic growth.

Finally, a dummy variable is introduced to capture the effects of major global economic shocks, specifically the 2009 financial downturn and the 2020 COVID-19 health crisis, which may have generated structural disruptions affecting both investment flows and economic growth.

The sample covers European countries, which have been grouped into three regional panels to reflect geographic and economic distinctions. Northern Europe is represented by countries such as Sweden, Ireland, and Norway, along with Denmark, Finland, and Iceland, as well as the Baltic states of Lithuania, Latvia, and Estonia, together with the United Kingdom. In Central and Eastern Europe, the panel includes Austria, Poland, and Romania, in addition to Bulgaria, Germany, Slovakia, Slovenia, and the Czech Republic. Southern Europe comprises nations including Portugal, Greece, and Albania, as well as North Macedonia, Malta, Croatia, Montenegro, Bosnia and Herzegovina, and Serbia. Overall, the empirical analysis covers a total of 27 European countries. The final country selection is based on data availability and consistency considerations, following a screening process aimed at excluding observations with substantial data gaps or extreme outliers. The dataset is constructed using annual observations for the period 2000–2023.

At the level of the total panel dataset, descriptive statistics for each variable are reported in Table 2, providing an overview of the main characteristics observed across European countries over the analysed period. The results highlight substantial cross-country and temporal variation, particularly from the perspective of economic performance and foreign direct investment.

The highest annual GDP growth rate was recorded by Ireland in 2015 (24.61%), reflecting a period of strong economic expansion driven by favourable tax policies and a high capacity to attract foreign direct investment. In contrast, the lowest GDP growth rate was observed in Latvia in 2009 (−16.04%), corresponding to the severe contraction experienced during the global financial crisis. The crisis had a widespread negative impact on the majority of countries included in the sample, with Poland and Albania representing notable exceptions, as they avoided negative growth rates during that period.

Foreign direct investment also exhibits considerable volatility. The maximum value, corresponding to 452.22% of GDP, was registered by Malta in 2018, reflecting its role as a regional financial and economic hub within the European Union, supported by a competitive fiscal framework similar to that of Ireland. Conversely, the minimum FDI value was observed in Iceland in 2017 (−28.30% of GDP), a period in which the economy was still adjusting to the aftermath of the 2008 financial crisis, while also facing less favourable conditions for foreign investors.

Table 2. Descriptive Statistics Individual Samples

Variable	Mean	Max	Min	Std. Dev.	Obs
GDP_G	2.64	24.61	-16.04	3.92	648
FDI	9.75	452.22	-28.30	41.04	641
EDU_ATT	19.07	41.41	0.00	10.84	350
HEALTH_EXP	8.09	12.93	4.21	1.67	607
EMP	53.12	77.02	29.90	7.78	648
EC_OPEN	-1.02	41.69	-41.89	9.92	648

Source: Authors' calculations performed using Stata 13

The correlation matrix for the entire panel dataset is presented in Table 3 to examine variable relationships. The coefficients indicate relatively weak linear associations among the explanatory variables, suggesting that multicollinearity is unlikely to affect the regression estimates. As a result, the variables can be simultaneously included in the econometric models without raising major specification concerns.

Table 3. Correlation Matrix of Total Panel Data Variables

Variable	GDP_G	FDI	EDU_ATT	HEALTH_EXP	EC_OPEN	EMP	DUMMY
GDP_G	1						
FDI	0.2473	1					
EDU_ATT	0.1701	0.0219	1				
HEALTH_EXP	-0.2197	0.0451	0.0646	1			
EMP	0.1209	0.0625	0.3903	0.2112	1		
EC_OPEN	0.2002	0.2397	0.2827	0.1692	0.4926	1	
DUMMY	-0.5365	0.0053	0.1802	0.1349	0.0366	0.0084	1

Source: Authors' calculations performed using Stata 13

Focusing on the association between economic growth and the independent variables, GDP growth shows a positive correlation with foreign direct investment, educational attainment, economic openness, and the employment-to-population ratio. In contrast, health expenditure is negatively correlated with economic growth, which may reflect short-term budgetary pressures associated with higher public spending. The dummy variable capturing the 2009 financial downturn and the 2020 COVID-19 health crisis also displays a negative correlation with GDP growth, consistent with the contractionary effects of these global shocks.

Correlation matrices were also computed for each regional subsample. The results remain broadly consistent with those obtained for the total panel dataset, supporting the inclusion of the same group of variables in the regression for the region-specific estimations.

3. Empirical Evidence on the FDI–Growth Nexus

This section provides empirical evidence on the FDI–growth nexus across European regions by estimating four econometric models, all statistically valid, analysing the effect of foreign direct investment on economic expansion in different areas of the Europe region. Table 4 presents all the regression models, economic growth being the endogenous variable, using Panel Least Squares and Panel EGLS regression models, both with fixed effects (cross section weights) and random effects (cross random effects).

Table 4. Panel Least Squares and Panel EGLS Regression Models, with Fixed and Random Effects, Unbalanced Panels (2000-2022)

Variable/Equations	i.	ii.	iii.	iv.
FDI	0.0096 (1.8666)*	0.1344 (4.7054)***	0.1126 (1.9966)**	0.0017 (0.3321)
EDU_ATT	0.0651 (3.6712)***	0.0627 (3.2841)***	0.0666 (2.7720)***	0.2193 (4.6867)***
HEALTH_EXP	-0.4103 (-1.7627)*	-0.4256 (-3.0452)***	-0.3196 (-2.6072)**	0.4394 (0.8968)
EMP	0.2160 (3.0964)***	0.0402 (0.8464)	0.1372 (1.8371)*	0.3773 (4.2632)***
EC_OPEN	0.0192 (0.5036)	0.1053 (3.2104)***	-0.0477 (-0.8512)	-0.1501 (-1.8384)*
DUMMY	-7.4747 (-13.4442)***	-5.7126 (-6.3221)***	-7.1577 (-10.8305)***	-11.0731 (-11.5665)***
_cons	-6.3796 (-1.4896)	1.9261 (0.6887)	-3.1298 (-0.8648)	-22.5432 (-3.8908)***
Number of observations	332	125	96	111
F-statistic	11.19	22.65	24.32	16.32
Prob > F	0	0	0	0
R-squared	0.5450	0.5352	0.6211	0.7041
Adj R-squared	0.4963	0.5116	0.5956	0.6610

Source: Authors' calculations based on estimations performed in Stata 13. Statistical significance: *** p<0.01, ** p<0.05, and * p<0.10. The coefficients are reported with t-statistics in parentheses.

Table 4 reports the estimation results obtained using Panel Least Squares and Panel EGLS techniques under fixed-effects and random-effects specifications for unbalanced panels covering the period 2000–2022. The four model specifications correspond to the total European panel and the three regional subsamples.

The first specification, Model (i), estimates a fixed-effects Panel Least Squares regression for the full sample of 27 European countries. The goodness-of-fit indicators suggest that the model explains a substantial share of the variation in economic growth, with an R-squared of 0.545. Foreign direct investment displays a positive coefficient and is statistically significant at the 10% level, indicating that an increase in FDI inflows is associated with higher economic growth. Educational attainment exhibits a positive and highly significant effect, highlighting the important role of human capital in supporting growth dynamics. Health expenditure enters the model with a negative coefficient and marginal statistical significance, suggesting that higher public spending on health may be associated with short-term growth trade-offs. The employment rate has a strong and positive effect on economic growth, while economic openness does not appear to exert a statistically significant influence in this specification.

Model (ii) presents the results for Northern European countries using a random-effects Panel EGLS estimator. The model continues to demonstrate a relatively high explanatory capacity, with an R-squared of 0.535. In this regional context, foreign direct investment exerts a strong and statistically significant positive effect on economic growth, reflecting the advanced institutional framework and innovation-oriented investment environment of Northern Europe. Educational attainment continues to have a positive and significant influence, while economic openness also emerges as an important growth-enhancing factor. By contrast, the employment rate does not display statistical significance, suggesting that labour market conditions in these countries may already be close to saturation.

The third specification, Model (iii), focuses on Central and Eastern European countries and is estimated using a random-effects Panel EGLS approach. The model explains approximately 62% of the variation in economic growth, as indicated by the R-squared statistic. Foreign direct investment presents a positive and statistically robust influence, underscoring its role in supporting industrial development, employment creation, technological diffusion, and integration into European production networks. Educational attainment maintains a positive association with growth, confirming the relevance of human capital for investment absorption. The employment rate also contributes positively and significantly to economic growth, while economic openness does not appear to have a statistically meaningful effect in this regional subsample.

Model (iv) reports the fixed-effects Panel Least Squares results for Southern European countries. In this case, foreign direct investment does not exhibit statistical significance, indicating that FDI inflows alone are insufficient to stimulate economic growth in this region. Instead, educational attainment and the employment rate emerge as the primary drivers of growth, both displaying large and statistically significant coefficients. These findings suggest that, in less developed Southern European economies, domestic structural factors, particularly education and labour market participation, play a more decisive role in shaping growth outcomes than external capital inflows. This outcome may reflect the presence of institutional bottlenecks and structural constraints that limit the effective transmission of FDI spillovers in Southern European economies. Factors such as regulatory rigidities, administrative inefficiencies, and policy inconsistencies may reduce the ability to fully absorb foreign capital. At the same time, potential crowding-out effects, where FDI does not complement domestic investment or generate significant productivity spillovers, may further explain its statistically insignificant impact on growth in the region.

Across all model specifications, the dummy variable capturing the 2009 financial downturn and the 2020 COVID-19 health crisis is statistically significant and negatively signed, reflecting the adverse effects of major global shocks on economic growth throughout Europe.

We also examined whether the influence of foreign direct investment differs with countries' levels of human capital and health expenditure. Thus, in Table 5 we introduced interaction terms between FDI and educational attainment (FDI × EDU_ATT), as well as between FDI and health expenditure (FDI × HEALTH_EXP). These interaction effects allow us to assess whether the influence of FDI on the economic growth is conditioned by improvements in education or health. Based on the empirical results of regression model (v), the interaction terms are statistically significant and it seems that in the countries with a higher level of education, foreign direct investment exerts a stronger positive effect on economic growth. This suggests that human capital enhances the absorptive capacity required to transform foreign direct investment inflows into productivity gains and sustained growth. On the other hand, the results show that in countries where health expenditure is higher, foreign direct investment has a lower contribution on economic growth. This means that greater health expenditure does not appear to strengthen the positive impact of FDI on the economy.

Table 5. Interaction terms analysis using Panel Least Squares regression models, with fixed effects (2000 – 2022)

Variable/Equations	v.
FDI	0.0302 - (0.8957)
EDU_ATT	0.0392 - (2.1472)**
HEALTH_EXP	-0.1352 - (-0.5632)
FDI*EDU_ATT	0.0061 - (4.1711)***
FDI*HEALTH_EXP	-0.0155 - (-3.5335)***
EMP	0.2223 - (3.2570)***
EC_OPEN	0.0284 - (0.7630)
DUMMY	-7.5393 - (-13.9373)***
_cons	-8.6183 - (-2.0152)**
Number of obs	332
F-statistic	11.69
Prob > F	0
R-squared	0.5725
Adj R-squared	0.5235

Source: Authors' calculations based on estimations performed in Stata 13. Statistical significance: *** $p<0.01$, ** $p<0.05$, and * $p<0.10$. The coefficients are reported with t-statistics in parentheses.

Overall, the findings indicate that FDI maintains an important role in supporting the development of European economies, although its contribution to economic growth varies across regions. The results suggest that the growth-enhancing effects of FDI are more pronounced in countries characterized by higher levels of educational attainment. A better-educated labour force appears to facilitate the effective absorption of foreign capital, thereby increasing the potential of FDI to support economic performance. In this context, policy measures aimed at strengthening human capital and improving institutional frameworks may

further enhance the positive impact of foreign investment, supporting sustainable long-term growth and helping to narrow regional economic differences.

Looking ahead, the post-pandemic recovery and the shift toward green FDI may alter regional patterns of investment and growth. Northern and Central and Eastern European countries may see an increased contribution of foreign investment, especially where human capital is strong, while Southern Europe could gradually benefit from targeted sustainable investments. These trends suggest that evolving FDI composition and sectoral focus could reshape growth dynamics across Europe after 2024.

Conclusion

Within Europe, foreign direct investment is an important driver of the economic growth experienced by host nations, accelerating the industrialization, job opportunities, EU integration, economic recovery, exports, tourism, green technologies and sustainability, innovation. The advantages associated with foreign direct investment can only be claimed through a balanced economic environment sustained in the host country through a healthy economic growth. Thus, the investors are attracted by the access to an expanding domestic market facilitated by increased consumption and demand, good infrastructure and logistics supported by larger public budgets, skilled workforce as a result of investments in education and training, stability and predictability achieved through efficient governance, solid policies, opportunities for regional expansion with the help of local economic cluster dynamics. A comparative analysis of European regions highlights the significant influence of geographical location on economic development. Northern European countries have a high level of productivity, innovation and quality of life, supported by stable institutions, a high-performance infrastructure and an orientation towards sustainability. In contrast, Central and Eastern European countries, although they have made remarkable progress in recent decades, continue to exhibit economic disparities caused by the post-communist transition, dependence on foreign investment and internal regional differences. In Southern Europe, economic vulnerabilities are associated with a high dependence on the tourism sector, structural rigidities and a lower level of technological innovation.

According to the results, foreign direct investment has a favourable effect on economic growth in Northern Europe and Central and Eastern Europe, regions characterized by high levels of education, a skilled and adaptable workforce, and ongoing technological advancement, which collectively enhance their attractiveness to investors. In contrast, Southern European countries display less developed economies, where education and employment are the primary factors influencing growth, while foreign direct investment appears statistically insignificant. This effect may reflect institutional bottlenecks and crowding-out effects, highlighting the importance of domestic structural factors for growth. Using the Panel EGLS estimation method with fixed effects as well as random effects across the three regional databases, the findings confirm that FDI has a statistically significant and positive impact on economic growth only in Northern Europe and Central and Eastern Europe, whereas in Southern Europe its effect is not significant. The positive results for the first two regions align with prior empirical studies, including those of Minh & Trinh (2023), Dua & Verma (2024), Bieleń et al. (2024), Bilas (2020), and Sha (2023), which similarly highlight the importance of FDI in driving economic growth across diverse country groups.

Several significant implications are concluded in the current study. From a theoretical standpoint, the research expands the conventional FDI - growth framework by incorporating education and health as critical components of human capital, showing that the benefits of foreign investment are closely linked to the social and institutional context of the host country. Empirically, the analysis reveals that FDI stimulates growth in Northern Europe and Central and Eastern Europe, but has a negligible effect in Southern Europe, emphasizing the influence of regional disparities and differing stages of development. The evidence indicates that foreign direct investment contributes more effectively to growth in countries with higher education levels, confirming the importance of the FDI–education interaction. This underscores the need to invest in human capital to fully leverage the potential of FDI for long-term economic progress. From a policy perspective, the evidence suggests that simply bringing in foreign investment does not guarantee sustainable economic growth. Governments should focus on strengthening education systems and institutional quality to enhance the absorptive capacity of their economies. By fostering these social development factors, European regions can reduce economic disparities, boost competitiveness, and create conditions for balanced and inclusive growth supported by foreign investment.

The study underlines the impact of regional variations on the connection between investments and growth in Europe, highlighting education and health as essential components of human capital. The findings suggest that policies promoting equitable access to education can foster regional convergence and balanced development. Policymakers can use these insights to design interventions aimed at promoting inclusive growth, improving access to education, and enhancing the attractiveness of less developed regions to foreign investors. However, the analysis remains limited by its reliance on regional-level data and by the use of education and health as proxies for human capital. Future research should extend the framework by examining how the green transition and digitalization influence FDI patterns and contribute to reducing economic disparities across European regions.

Credit Authorship Contribution Statement

Mocanu, A-R.: Data curation, Validation, Investigation, Methodology, Writing - original draft. Giannozzi, A.: Conceptualization, Formal analysis, Writing – review & editing, Supervision.

Acknowledgments/Funding

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Data Availability Statement

The data that support the findings of this study were obtained from the World Bank Open Data database and are openly available at https://databank.worldbank.org. The datasets were downloaded by the authors and further processed and analysed using Microsoft Excel and Stata.

Ethical Approval Statement

Ethical approval was not required for this study, as it is based exclusively on secondary data obtained from publicly available institutional sources (World Bank Open Data). The data are fully anonymised and do not involve human participants, personal data, or animal subjects.

References

Abdallah, A. B. (2024). The relationship between trade openness, foreign direct investment inflows, and economic growth in Middle East and North of Africa region: Autoregressive distributed lag model vs. vector error correction model. *Journal of the Knowledge Economy*, *15*(1), 1118–1141. https://doi.org/10.1007/s13132-023-01099-x

Alam, W., Ikram, F., Kumar, P., Haseeb, M., & Ali, N. (2024). Asymmetric effects of foreign direct investment on economic growth: Fresh evidence from India using NARDL simulation. *Millennial Asia, 15*(3), 409-428. https://doi.org/10.1177/09763996221122205

Arbia, A., & Sobhi, K. (2024). Foreign direct investment, information and communication technology, and economic growth: The case of North African countries. *Scientific African*, *24*, e02234, 1–11. https://doi.org/10.1016/j.sciaf.2024.e02234

Baltagi, B. H. (2021). Econometric Analysis of Panel Data (Latest Edition). Springer Charm. https://doi.org/10.1007/978-3-030-53953-5

Bieleń, M., Ikani, K. S., & Włodarczyk, J. (2024). Diversity within commonality: A comparative study of the impact of foreign direct investment and trade openness on economic growth. *Journal of International Studies*, *17*(1), 174–187. https://doi.org/10.14254/2071-8330.2024/17-1/10

Bilas, V. (2020). FDI and economic growth in EU13 countries: Cointegration and causality tests. *Journal of Competitiveness, 12*(3), 47–63. https://doi.org/10.7441/joc.2020.03.03

Dua, P., & Verma, N. (2024). FDI–growth nexus in emerging economies: Role of financial sector development. *Foreign Trade Review, 1–22.* https://doi.org/10.1177/00157325241227326

Haini, H., Lim, G., & Loon, P. W. (2024). Does FDI source matter for growth? Evidence from Asian FDI inflows in ASEAN countries. *Journal of the Knowledge Economy*, *15*(4), 17726–17750. https://doi.org/10.1007/s13132-024-01851-x

Hakim, D. R., & Budi, S. (2024). Governance and economic growth: The mediating role of FDI inflows. *Institutions and Economies, 16*(3), 1–25. https://doi.org/10.22452/IJIE.vol16no3.1

Kumari, R., Shabbir, M., Saleem, S., Khan, G. Y., Abbasi, B. A., & Lopez, L. B. (2023). An empirical analysis among foreign direct investment, trade openness and economic growth: Evidence from the Indian economy. *South Asian Journal of Business Studies, 12*(1), 127–149. https://doi.org/10.1108/SAJBS-06-2020-0199

Lam Ho, T., Nguyen, B., & Ho, T. (2024). Is there a trade-off between economic growth, foreign direct investment, international trade and environmental degradation? A comparison between Asian developed and developing countries. *Foreign Trade Review*, 1–26. https://doi.org/10.1177/00157325231214319

Le, H. T. P., Pham, H., Do, N. T. T., & Khoa, D. (2024). Foreign direct investment, total factor productivity, and economic growth: Evidence in middle income countries. *Humanities and Social Sciences Communications*, *11*, 1388, 1–11. https://doi.org/10.1057/s41599-024-03462-y

Malik, A., & Sah, A. N. (2024). Does FDI impact the economic growth of BRICS economies? Evidence from Bayesian VAR. *Journal of Risk and Financial Management*, *17*(1), 10, 1–19. https://doi.org/10.3390/jrfm17010010

Mawutor, J. K. M., Sogah, E., Christian, F. G., Aboagye, D., Preko, A., Mensah, B. D., & Boateng, O. N. (2023). Foreign direct investment, remittances, real exchange rate, imports, and economic growth in Ghana: An ARDL approach. *Cogent Economics & Finance, 11*(1), 2185343. https://doi.org/10.1080/23322039.2023.2185343

Minh, V. T. H., & Trinh, P. T. T. (2023). The impact of FDI on economic growth in developing countries: The role of FDI inflow and trade openness. *The Economics and Finance Letters*, *10*(3), 216–229. https://doi.org/10.18488/29.v10i3.3519

Mustafa, G. (2023). The dynamic relationship between financial development, economic growth, foreign direct investment and trade openness: Evidence from South Asian countries. *Millennial Asia*, *14*(3), 406–433. https://doi.org/10.1177/09763996221138465

Phung, T., Rasoulinezhad, E., & Thu, H. (2023). How are FDI and green recovery related in Southeast Asian economies? *Economic Change and Restructuring, 56*, 3735–3755. https://doi.org/10.1007/s10644-023-09561-z

Rajab, B., & Zouheir, A. (2023). Complementarity relationship between foreign direct investment, human capital threshold and economic growth: State of the 15 least developed African countries. *Journal of the Knowledge Economy, 15*(2), 7216–7236. https://doi.org/10.1007/s13132-023-01314-9

Sha, Z. (2023). The effect of globalisation, foreign direct investment, and natural resource rent on economic recovery: Evidence from G7 economies. *Resources Policy*, *82*(103474), 1–8. https://doi.org/10.1016/j.resourpol.2023.103474