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DETERMINANTS OF FOREIGN DIRECT INVESTMENT: INSIGHTS FROM SELECTED EU COUNTRIES*

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Abstract. Foreign Direct Investment (FDI) is a key driver of economic growth, innovation, and sustainable development. Understanding its macroeconomic determinants is essential for policymakers aiming to foster favourable investment environments. However, existing literature lacks consensus on which macroeconomic factors significantly influence FDI. This study addresses this gap by exploring the determinants of FDI across selected EU countries. The study aims to analyze the impact of key macroeconomic variables, such as GDP growth, unemployment rate, public debt, trade openness, corporate income tax rate, and inflation, on FDI, and to identify the most significant drivers of investment flows in the EU context. Panel regression analysis was conducted using data from 17 EU countries from 2014–2023. Data were sourced from Eurostat, OECD, the World Bank, and the International Monetary Fund. The random effects model was selected based on the Hausman test, ensuring robust results. GDP growth and unemployment rate positively influenced FDI, while public debt, trade openness, and corporate income tax rates negatively impacted it. Inflation was not statistically significant. These findings underscore the importance of economic growth and fiscal prudence in attracting investments. This study contributes to the literature by identifying critical macroeconomic factors affecting FDI in the EU, providing actionable insights for policymakers to optimize investment climates. The research also offers a foundation for further empirical investigations into FDI determinants.

Keywords: determinants of FDI; public debt; trade openness; corporate income tax; panel regression

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1. Introduction

Investment is a key driver of economic growth, business expansion and job creation. In macroeconomics, investment refers to spending on capital goods—such as machinery, buildings, infrastructure, and technology—that increase the economy's productive capacity. The level of investment in the economy can significantly affect its overall economic performance, affecting both short-term fluctuations and long-term growth trends. Understanding the macroeconomic determinants of investment is essential for policymakers, businesses and economists seeking to promote sustainable economic development. Broad economic factors influence the

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decision-making processes of companies, governments, and other economic entities regarding allocating resources to investment projects. These determinants help explain why investment levels fluctuate over time and why some economies experience strong investment growth while others face stagnation.

Investment decisions are influenced by a complex interplay of factors at the macroeconomic level. Understanding these determinants is critical for policymakers, businesses and investors alike, as they shape the overall investment environment in the economy. Economic stability, sound fiscal and monetary policies, favourable business conditions and technological innovation are vital to support healthy levels of investment that drive economic growth. Macroeconomic determinants of investment refer to general economic factors that influence the level and direction of investment in the economy. These determinants are key to understanding how businesses and governments allocate resources to capital formation, whether for new projects, expansion or infrastructure. One of the main objectives of economic policy is to increase capital accumulation in terms of investment, which is necessary to maintain a sustainable rate of growth in developing and developed countries. (Kalaš et al., 2024) Due to the influence of determinants, the level of investments in the economy tends to fluctuate more than other components of aggregate demand. This is because the underlying determinants also tend to change. (Emako, 2022) Uncovering the true determinants of investment has recently become increasingly important worldwide. (Alalmi, 2024) In general, this topic has been of interest to politicians and economists for a long time, as it is an essential source of financing. Before the process of globalization, it is necessary to attract investments. (Rathnayake et al., 2023) It can increase capital inflows and production, improve infrastructure, create jobs and contribute to higher economic growth.

Investments are important for any economy because they ensure its development and innovation. Understanding investment determinants is key to developing strategies that support economic growth and channel capital toward sustainability and innovative practices. There is no consensus in the literature about the macroeconomic factors influencing investment. Several researchers (e.g., Kalaš et al., 2024; Hysa et al., 2022; Marinescu et al., 2019) focused on analyzing macroeconomic indicators that largely determine investments. Several studies, e.g., Emako (2022), Sajilan et al. (2019), Tayebiniya, Khorasgani (2018), and Aljbory (2016), revealed a strong link between investment and economic growth.

2. Literature review

In essence, investment is a fundamental tool in financial planning that allows individuals and institutions to grow their wealth over time by strategically putting their money to work. Keynesian economics emphasizes that investment is a function of demand, meaning that when consumer spending and demand for products increase, firms are incentivized to invest more to meet this demand. The determinants of investment influence how much businesses and individuals choose to invest in various assets, projects, or financial markets. These determinants are central to understanding investment dynamics, as they explain why investment levels fluctuate and what drives changes in economic activity. Several authors dealt with the topic of investment determinants. According to Endriukaitienė et al. (2022), the determinants of investments can be divided into two groups. One group includes internal factors, e.g., the size of the enterprise, the place of business, and the intensity of research and experiments, while the analysis of these factors helps to answer the question of what encourages the enterprise. (Economou et al., 2017) Another group consists of external factors, i.e., advantages of the country, e.g. market size or labour cost. (Belgibayeva & Plekhanov, 2019) The analysis of external factors answers the question of what attracts investments to the country. Shafigas et al. (2021) state that investments are significant for developing countries' economies because they support economic growth. Investments are an essential part of economic growth and globalization of finance, as they attract foreign capital and advanced technology and improve management skills. (Alfaro, 2017) In their study, Kalaš et al. (2024) tried to cover the most used macroeconomic determinants affecting investments in general. Studies on investment determinants (Sharma & Kautish, 2020) have pointed out that the level of investment depends on the level of development of countries. In many countries, investment plays a vital role in economic growth because it attracts investors who develop the economy and improve the quality of human resources. (Simionescu & Naros, 2019) In summary,

determinants ranging from economic conditions to investor sentiment help to explain why investment levels vary over time and across different regions and sectors.

Empirical analyses carried out over the years indicate that the most critical determinants of investments are macroeconomic variables such as market size (measured by GDP growth or GDP per capita), inflation, employment level, and interest rates (Kalaš, 2024; Alalmai, 2024; Carvelli; 2023; Okafor et al., 2017) although recent studies also consider other explanatory factors, such as wages, exchange rate, government spending or debt. (Kalaš et al., 2024; Emako, 2022; Endriukaitienė et al., 2022; Lisowski et al., 2021)

Previous research (Emako, 2022; Sajilan et al., 2019; Tayebiniya & Khorasgani, 2018; Aljbory, 2016) concluded that economic activity represents one of the most analyzed determinants of investment and is often measured by gross domestic product. GDP is a measure of the size of the economy and an important indicator reflecting the country's macroeconomic operations. (Wang et al., 2023; Sineviciene, 2015) A higher GDP value is usually associated with higher economic stability and progress and, therefore, can create a favourable environment for investment. (Belgibayeva & Plekhanov, 2019) GDP per capita indicates economic development, and its high value can attract investors. Suyuan and Khurshid (2015) and Ahmad and Zhao (2018) found a positive causality between investment and GDP growth. Romano and Scandurra (2016) and Carvelli (2023) investigated the positive relationship between GDP per capita and investment. On the other hand, Akinlo and Oyeleke (2018) showed a negative impact of GDP per capita on investment in Nigeria, which was like the empirical findings of the study by Ayeni (2020) and Dang et al. (2020), who confirmed that GDP negatively affects investment.

Inflation is another typical macroeconomic indicator affecting investments (Azhgaliyeva et al., 2023), depending on their dynamics. (Todorovic et al., 2016) However, the effects of inflation are contradictory. An increase in inflation can lead to economic uncertainty and make it difficult for investors to make investment decisions. (Ababio et al., 2022) The negative but significant impact of inflation on investments was also confirmed by Akinlo, Oyeleke (2018) and Martins et al. (2020). Ayeni (2020) also stated that inflation significantly and negatively affects investment, but only in the short term. This finding is related to Dang et al. (2020), whose study also confirmed that inflation is not a significant determinant of investment in the long run. Similarly, Omitogun (2018) found different inflationary responses to investment. Rathnayake et al. (2023) report a negative impact of inflation on investment (Alalmai, 2024), while Alshamsi et al. (2015) and Sajilan et al. (2019) demonstrated a significant positive relationship between inflation and investment.

To provide information on human capital, the authors (Martins et al., 2020; Adinda, 2018) used the total labor force as input. Several recent studies have found a positive relationship between human capital and investment (Martins et al., 2020; Rumanko et al., 2021; Jurickova et al., 2020), as firms are more willing to invest in countries where workers have higher levels of education and training. (Pose & Cols, 2017) High unemployment can cause instability in the economy and discourage investors. (Okafor et al., 2017) Regarding the empirical relationship between investment and unemployment, Hoon et al. (2023) and AtilawWoldetensaye et al. (2022) demonstrated their negative relationship. On the contrary, Strat et al. (2015) found no causality between investment and unemployment.

The link between interest rates and investment has proven to be important when it comes to the financial structure of an investment. (Kalaš et al., 2024) On the one hand, if interest rates are low, borrowing costs decrease, i.e., loans become more available and favourable, so investors are advised to invest. (Inessa et al., 2019) On the contrary, high interest rates increase the cost of loans. (Giebel & Kraft, 2018) The negative impact of interest rates on investments was demonstrated by the analysis of Marinescu et al. (2019), while the authors of Kharb et al. (2024) concluded that the relationship between interest rate and investment is negative in the long run but positive in the short run. Krugman and Wells (2015) and Akinlo and Oyeleke (2018) confirmed their negative but significant relationship. The results of the research team Lisowski et al. (2021) are inconclusive as they conclude that there are significant Pearson correlations between investment and interest

rates. However, these relationships are not confirmed by random correlation, i.e., that financial constraints caused by capital costs positively affect investment. (Sharma et al., 2019)

Government debt is one of the variables that has a negative impact on investment. (Marinescu et al., 2019) In general, it was found that countries with high debt and especially risk for the sustainability of public debt negatively affect the development of investments. (Mirovic et al., 2023). In her research, Sineviciene (2015) came to a similar conclusion as Akinlo and Oyeleke (2018). They used error correction model analysis to examine the effects of government debt as a proxy for investment, with a negative but insignificant impact in the long run. Debt obtained a negative coefficient, not too large although statistically significant, in the analysis carried out by the researchers Marinescu et al. (2018) and Lehmann et al. (2022); therefore, debt does not have a significant impact on investment.

Endriukaitienė et al. (2022) concluded that wages are a statistically insignificant variable in relation to investments. On the other hand, Hoang and Bui (2015) and Mansi et al. (2020) argue the opposite, as higher wages can increase consumer demand. Thus, if wages rise, workers have more disposable income, which leads to higher consumption. (Nguyen, 2024; Emako, 2022) This increased demand for goods and services can encourage businesses to invest more, e.g., to modernize technologies. And so, if higher wages lead to increased demand, companies can respond by investing more to meet it. (Bachmann & Zorn, 2020; Xuan, 2020).

Economou et al. (2017) showed a negative but insignificant relationship between corporate tax and investment. Based on the empirical results of the research of Kalaš et al. (2024), we claim that taxes significantly affect investments in both the short and long term, and according to the authors, tax policy plays an important role in shaping investment decisions. The significant relationship between corporate tax and investment was also confirmed in the studies of Minh Ha et al. (2024) and Đurovic Todorovic et al. (2024), while it was a negative relationship.

Based on the research we studied, we created an overview of the databases (Table 1) from which data were most often taken for analysis. The authors drew primarily from the database of the World Bank, the United Nations Conference on Trade and Development (UNCTAD) and Eurostat.

Table 1. The databases overview

Database	Author
World Bank	Alalmai (2024), Patel et al. (2024), Emako et al. (2022), Endriukaitienė et al. (2022), Martins et al. (2020), Economou et al. (2017)
UNCTAD	Alalmai (2024), Emako et al. (2022), Endriukaitienė et al. (2022), Economou et al. (2017)
Eurostat	Kalaš et al. (2024), Endriukaitienė et al. (2022), Lisowski et al. (2021), Marinescu et al. (2019)
IMF	Hysa et al. (2022), Economou et al. (2017)
OECD	Kalaš et al. (2024)

Source: Authors' elaboration

The following table (Table 2) shows an overview of the research devoted to the determinants of investments. We were particularly interested in those in which the authors analyzed the impact of macroeconomic indicators on investments while applying various statistical methods. Macroeconomic indicators are essential for studying the determinants of investments because they provide a comprehensive view of the economic environment that directly influences investment decisions. Indicators such as GDP, inflation, and unemployment reflect the overall health of the economy and its growth potential, which are critical factors for investors. For instance, higher GDP levels indicate increased economic activity and demand, while low interest rates reduce financing costs and stimulate capital expenditure. Additionally, indicators like trade openness and tax rates affect the profitability and feasibility of investments. By evaluating these factors, investors can identify opportunities, assess risks, and understand the impact of fiscal and monetary policies on the investment climate.

Table 2. Overview of research on the determinants of investment

Author	Macroeconomics indicator	Research method
Alalmai (2024)	GDP, GDP per capita, inflation, imports, exports, level of corruption, government spending.	Descriptive statistics Multiple linear regression
Kalaš et al. (2024)	Real GDP per capita, government spending, unemployment, inflation, tax revenue, interest rate.	Error correction model
Patel et al. (2024)	GDP, import, export, inflation, infrastructure.	Error correction model ARDL bounds testing approach
Emako et al. (2022)	Population, GDP per capita, labour force, availability of natural resources, import, export exchange rate, inflation, minimum wage.	Driscoll and Kraay standard errors
Endriukaitienė et al. (2022)	Population, average monthly salary, tax burden.	Multiple linear regression
Hysa et al. (2022)	Unemployment, interest rates, economic growth, inflation.	Descriptive statistics Multiple regression analysis
Lisowski et al. (2021)	Production, consumption, interest rate.	Canonical analysis Linear and causality correlation Autocorrelation and cointegration tests
Martins et al. (2020)	GDP, Inflation, Credit, Labor, Trade, Government Stability.	Cross-sectional time-series FGLS Panel ARDL
Marinescu et al. (2019)	Income, output gap, public debt, interest rate, loans, GDP, population, active population.	Descriptive statistics Correlation analysis OLS panel
Economou et al. (2017)	GDP per capita, imports and exports as a percentage of GDP, labour costs, corporate income tax, and inflation.	Descriptive statistics Fixed effects panel model Arellano–Bover/Blundell–Bond Dynamic Panel

Source: Authors' elaboration

3. Methodology and data

This paper formulates *hypothesis H1: Selected macroeconomic indicators significantly impact investments*. This impact will be analyzed through panel regression that investigates the relationship between selected macroeconomic indicators (such as GDP, inflation, unemployment, openness of the economy, etc.) and investments in the studied countries and time periods.

Data on investments are collected at the micro-level and macro-level of selected EU countries. The research will be processed based on the latest statistics from Eurostat and other internationally recognized sources available at the time of analysis (OECD, World Bank, IMF). Wherever possible, international sources will be used to ensure comparability between countries. First, suitable variables were selected, and secondary data were collected. Then, a research sample was sorted and created, forming our research's basis. Comparison methods are used to compare the obtained results, and based on the synthesis method, we will formulate conclusions on the investigated issue. We monitor a time horizon of 10 years between 2014 and 2023. Based on the availability of data, the examined sample includes selected EU countries, which are: Austria (AT), Belgium (BE), Czech Republic (CZ), Denmark (DE), Finland (FI), France (FR), Germany (DE), Greece (GR), Italy (IT), Latvia (LV), Lithuania (LT), Poland (PL), Portugal (PT), Slovakia (SK), Slovenia (SI), Spain (ES) and Sweden (SE).

It is assumed that investors' decision-making process is influenced by a wide range of factors that are considered determinants of investments. However, there is no consensus among economists about which ones are key. Based on the professional articles we studied, we tried to propose and define the determinants that most influence investments and these will be examined in this work. The following table (Table 3) captures the macroeconomic determinants we selected, their units, and the sources from which the data will be drawn.

Table 3. Selected determinants

Determinants	Abbreviation	Unit	Source
Foreign Direct Investment	INV	Net inflow, percentage of GDP	IMF
Gross domestic product	GDP	Annual percentage growth rate of GDP	World Bank
Inflation	HICP	Harmonized index of consumer prices in percentage	OECD
Public Debt	PD	Percentage of GDP	Eurostat
Trade Openness	TO	Percentage of GDP	IMF
Unemployment Rate	UR	Percentage of the labour force	OECD
Corporate Income Tax Rate	CITR	Tax rate in percentage	OECD
Interest rate	IR	Long-term real in percentage	Eurostat
Gross fixed capital formation	GFCF	Percentage of GDP	Eurostat
Unit labour cost performance	ULC	Percentage change (t/t-1)	Eurostat
Political stability	PS	Political Stability and Absence of Violence/Terrorism Index (ranging from -2.5 to 2.5)	World Bank

Source: Authors' elaboration

We aim to verify the dependence between the explained variable (investments) and the explanatory variables (individual determinants).

The study's methodology focuses on analyzing the determinants of investment, with a key step being the selection of relevant macroeconomic indicators that influence investment decisions. The first step in the analysis was data preparation, which included performing a correlation test and Variance Inflation Factor test. These steps ensured that false regression pitfalls were avoided and that the subsequent regression analysis would be accurate. Descriptive statistics and a correlation matrix were first conducted to provide a thorough summary of the data's primary trends and the relationships between the variables. We also created a series of regression models to estimate the impact of selected indicators on investments. The determinants of investment in EU countries were then analyzed using panel regression. This statistical approach, which combines cross-sectional data (data collected from multiple subjects at a single point in time) and time-series data (data collected from a single subject at multiple time points), allows the analysis of the dependence between explanatory and dependent variables. Panel regression thus accounts for heterogeneity between countries and, over time, provides more robust and precise results.

The general formula for our model is:

$$INV = \beta_0 + \beta_1 GDP + \beta_2 HICP + \beta_3 PD + \beta_4 TO + \beta_5 UR + \beta_6 CITR + u_{it} \quad (1)$$

Where u_{it} is the error term for each country i and time period t .

To verify the significance and validity of the model, various statistical tests will be used. The Hausman test will help decide between the fixed effects and random effects models, determining which model is more suitable in this case. Additionally, tests such as Breusch-Pagan and Pesaran CD will be used to detect heteroskedasticity and spatial dependence, while the Breusch-Godfrey/Wooldridge test will be used to check for potential serial correlation.

Another step in the analysis will be the use of the Generalized Method of Moments (GMM) model, which is appropriate for analyzing panel data, especially in cases where endogeneity or incorrect model specifications exist. The GMM method provides robust estimates even when some variables are endogenous, i.e., correlated with the model's error term. This model is particularly useful if there is suspicion of simultaneity between

investments and macroeconomic factors, which could lead to inaccurate estimates when using traditional regression methods. The GMM model will serve as a complement to panel regression and provide more precise results in analyzing the determinants of investment. These tests and models will ensure the reliability and accuracy of the analysis results and contribute to a more robust and detailed interpretation of the macroeconomic factors' impact on investment.

The analytical part of the work mainly uses panel regression since we have the data in full panel form. The significance level of all tests is 5%. We will use the econometric software R. (R Core Team, 2018) for processing.

4. Results

The first part of the analysis consists of descriptive statistics (Table 4) of the determinants of investment. The dependent variable is INV and the explanatory variables are GDP, HICP, PD, TO, UR, CITR, IR, GCF, ULC and PS. The average investment is 2.3094, with a value ranging from -7.7 to 12.1, which is approximately a wide range in investment values. Skewness 0.6190 values - a slightly negative value, meaning that they are slightly shifted. Investments in the analyzed countries show high volatility, with the average value of investments being positive. Still, the range shows significant differences between countries, which can be influenced by various factors such as economic conditions and political stability in individual countries. Trade openness varies considerably between countries. A slight right-sided asymmetry indicates that most countries have trade openness around the average, but there are also countries with very high values (Belgium, Slovakia, Czech Republic). Public debt shows that there are large differences in the level of indebtedness in the analyzed countries. Countries have different levels of public debt, with some countries having relatively low debt while others have much higher values. A slight right-sided asymmetry indicates that most countries have a reasonable level of debt, but there are also countries with significant public debt (Greece, Italy, Portugal).

Table 4. Descriptive statistics

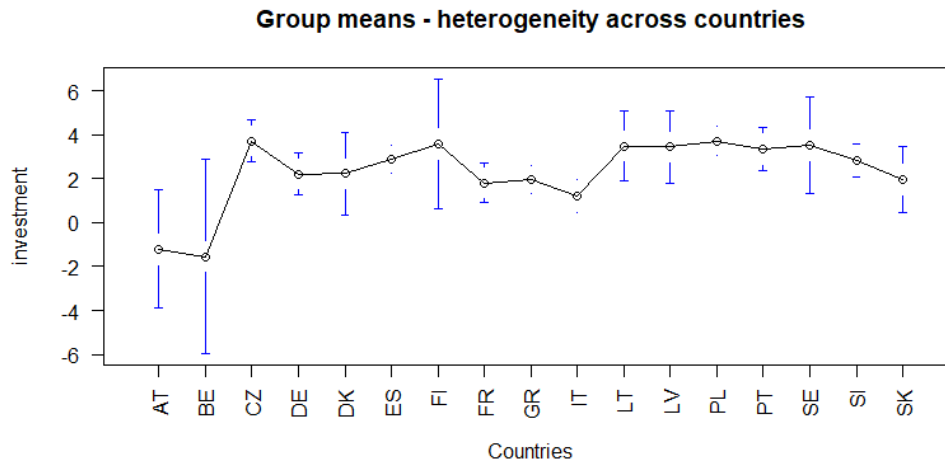
Variables	Mean	SD	Median	Min	Max	Range	Skew	Kurtosis	SE
INV	2,3094	2,8899	2,5	-7,7	12,1	19,8	-0,6190	2,5547	0,2216
GDP	1,9293	3,1297	2,2	-11,1673	8,3799	19,5472	-1,3614	3,5659	0,2400
HICP	2,6088	3,5700	1,4	-1,4	18,9	20,3	2,0098	4,2596	0,2738
PD	79,3159	41,1105	69,1	29,3	207	177,7	0,9418	0,2200	3,1530
TO	109,5288	38,6308	101,95	55,3	203,9	148,6	0,5012	-0,9111	2,9628
UR	8,1618	4,5723	7,1	2	26,6	24,6	1,7717	3,6551	0,3507
CITR	22,5716	5,3490	22	15	44,4333	29,4333	0,9022	1,1201	0,4103
IR	1,5377	1,6221	0,9704	-0,51	9,67	10,18	1,8258	4,8928	0,1244
GFCF	3,5912	0,9946	3,6	1,6	6,5	4,9	0,2870	-0,5706	0,0763
ULC	0,5982	2,1509	0,3	-4,1	9,4	13,5	0,6249	1,2250	0,1650
PS	0,6591	0,3051	0,7088	-0,23556	1,2822	1,5178	-0,5542	-0,2368	0,0234

Source: Authors' calculations

Figure 1 shows the differences in investment activity across countries. This chart compares investment trends and performance in selected EU countries, allowing us to identify how investment varies across countries. It shows the variability of investment, highlighting countries that show significantly higher or lower levels of investment compared to others, and also shows which countries experience stable investment growth, which experience large fluctuations and which countries tend to show similar investment behaviour. Overall, the chart provides an insight into the heterogeneity, i.e. the diversity of investment activity. In terms of fluctuations, the most significant changes occur in Belgium (19.8), Finland (11.8) and Austria (11), where sharp increases and decreases are observed in some years, indicating high volatility and sudden changes in their development. On

the contrary, countries such as Spain (2.2), Poland (3) and Greece (3.1) show a more stable development with smaller fluctuations, showing a more moderate growth or decline without sudden reversals.

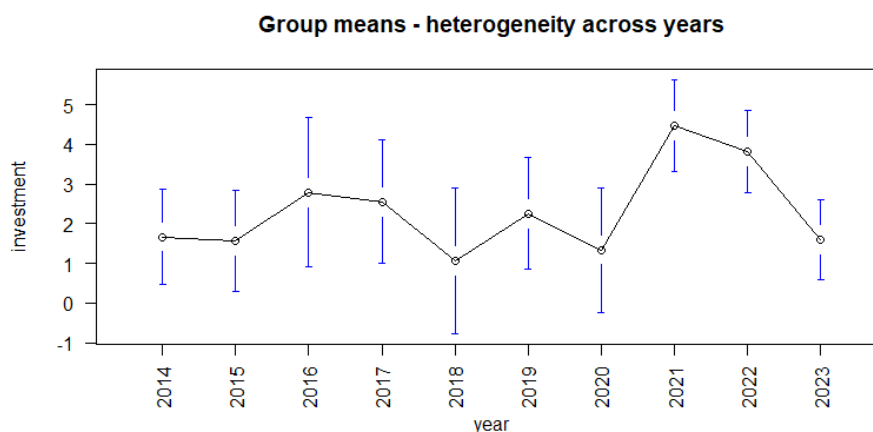
Figure 1. Heterogeneity across countries



Source: Authors' elaboration

Figure 2 captures the heterogeneity of investments over the years. The results of the variance analysis show that the largest fluctuations in investments occurred in 2016, 2017 and 2020. The year 2016 shows the largest range of fluctuations (19.4), which indicates that investments fluctuated within a wide range between the maximum and minimum values in this year. This significant range may result from unpredictable economic events or external factors that cause volatility in the market. The years 2017 and 2020 also show significant fluctuations (14.1 and 13.1), which may be related to global economic events and situations influencing investment decisions. On the other hand, the years 2023, 2022, and 2021 show minor fluctuations (7.3 to 8.2), indicating a more stable market and less investment volatility, which may indicate better economic stability and lower volatility in these years.

Figure 2. Heterogeneity across years. Source: Authors' elaboration



Correlation coefficients, which are key to identifying linear relationships between variables, are captured in Table 5. If their values are lower than 0.8, they indicate a moderate to weak correlation between these variables. Thus, the variables are relatively independent. If the correlations are positive, values between 0.2 and 0.4 signal

a weak correlation, while values between 0.4 and 0.7 represent a moderately strong relationship. Correlations in this range may indicate that the variables move in the same direction but not in a completely synchronized and strong relationship. A negative correlation between -0.2 and -0.4 indicates a weak inverse relationship, where a change in one variable causes a slight change in the other in the opposite direction. Larger negative correlations in the range of -0.4 to -0.7 show a moderately strong relationship, indicating that the variables often move in opposite directions but not entirely predictable. These correlation values are important in analyzing relationships between variables because they indicate that other factors may be present in addition to the correlation itself, influencing the relationships between variables.

Table 5. Correlation Matrix

	INV	GDP	HICP	PD	TO	UR	CITR	IR	GFCF	ULC	PS
INV	1,0000										
GDP	0,2592	1,0000									
HICP	0,1538	0,1564	1,0000								
PD	-0,1995	-0,1821	-0,1854	1,0000							
TO	-0,0254	0,2083	0,3072	-0,4629	1,0000						
UR	-0,0226	-0,0919	-0,3561	0,6455	-0,4257	1,0000					
CITR	-0,2620	-0,1269	-0,1988	0,5846	-0,3582	0,3911	1,0000				
IR	0,0036	0,0081	0,2510	0,3653	-0,1266	0,4134	0,1085	1,0000			
GCF	0,1953	0,0450	0,1657	-0,4790	0,2056	-0,1949	-0,3266	0,0425	1,0000		
ULC	0,1033	-0,0811	0,3428	-0,4113	0,4038	-0,3281	-0,3875	-0,1241	0,1231	1,0000	
PS	0,1415	0,0960	0,0033	-0,5791	0,2890	-0,5663	-0,3737	-0,3739	0,1433	0,1601	1,0000

Source: Authors' calculations

The results of the VIF test (Table 6) show that most of the variables in the models have VIF values below 5, which means that multicollinearity between the variables is not performed. Most variables have VIF values below 2, meaning there is no significant correlation between them, and their coefficients should be stable and accurate. The variables PD and UR have VIF values higher but still below 5, which means that multicollinearity is moderate and will not have a significant impact on the stability of the model. The average VIF value is 1.8707, which is relatively low and supports the stability of the regression model. These results show that the model will not suffer from problems associated with multicollinearity, and its coefficient is likely reliable for further analysis.

Table 6. VIF test

Variables	VIF	1/VIF
GDP	1,1697	0,8549
HICP	1,7434	0,5736
PD	3,4421	0,2905
TO	1,4967	0,6681
UR	2,6343	0,3796
CITR	1,6485	0,6066
IR	1,6597	0,6025
GFCF	1,4831	0,6743
ULC	1,5919	0,6282
PS	1,8372	0,5443
Mean VIF	1,8707	

Source: Authors' calculations

Before testing the model, the Im, Pesaran and Shin (IPS) unit root test was also performed for individual variables in the panel data, and the results showed that most of the variables are stationary. The exception was interest rates, which failed the stationarity test and showed the presence of a unit root (p-value=0.999). This result indicates that interest rates are not stationary, and their behaviour over time may change, which may affect the stability of the model. Due to this instability, the interest rate was excluded from the variables considered to ensure the reliability and consistency of the resulting model, which focuses on stationary variables.

The results of a series of regression models aimed at estimating the impact of various independent variables on investments are presented in Table 7. The GDP coefficient is consistently positive across all models, indicating a positive and significant impact of GDP on investments. In other words, an increase in GDP leads to higher levels of investment, potentially linked to greater economic activity and a favourable business environment in economies with growing GDP. Inflation, represented by HICP, is also positive across all models, with its impact becoming significant only after adding additional variables (from model 4 onwards). This positive relationship may suggest that moderate inflation growth can stimulate investment activity in the context of low interest rates. The public debt is predominantly negative, implying that an increase in public debt leads to a reduction in investment inflows. This result suggests that high public debt levels create market uncertainty or divert resources that could be used for productive investments. However, the impact of government debt was not significant in all models. The trade openness, representing the percentage share of the sum of exports and imports in a country's GDP, was significant across all models (from model 4 to model 9). The data showed a negative relationship between trade openness and investment inflows, possibly reflecting more substantial exposure to external shocks or competition in global markets. An increase in the corporate income tax rate (CITR) reduces investment inflows, indicating an inverse and significant relationship across all analyzed models (from model 6 to model 9). Higher taxes likely reduce the net returns on investments, discouraging investors. A positive but insignificant effect was identified among other analyzed variables, such as political stability, gross fixed capital formation (GFCF), unit labour costs (ULC), and political stability. This suggests that while these factors may contribute to a better business environment, their statistical significance was not established within this model.

Table 7. Baseline regression results

	GDP	HICP	PD	TO	UR	CITR	PS	GFCF	ULC	β
1	0,2394*** (0,0688)									1,8476* ** (0,2524)
2	0,2226** (0,0694)	0,0940 (0,0608)								1,6348* ** (0,2867)
3	0,2020** (0,0697)	0,0754 (0,0612)	-0,0100. (0,0053)							2,5171* ** (0,5496)
4	0,2232** (0,0689)	0,1154. (0,0619)	- 0,0165* * (0,0058)	- 0,0170* * (0,0063)						4,7563* ** (0,9926)
5	0,2101** (0,0686)	0,1532* (0,0640)	- 0,0246* ** (0,0070*))	-0,0154* (0,0063)	0,1289* (0,0631)					4,0938* ** (1,0354)
6	0,2105** (0,0674)	0,1388* (0,0632)	-0,0160* (0,0076)	- 0,0170* * (0,0063)	0,1247* 0,0622)	-0,1214* (0,0475)				6,3944* ** (1,3589)
7	0,2069** (0,0672)	0,1648* (0,0652)	-0,0130 (0,0079)	- 0,0171* * 0,0063	0,1629* 0,0667	-0,1156* (0,0474)	1,3708 (0,8892)			4,7592* * (1,7194)
8	0,2128** (0,0673)	0,1552* (0,0656)	-0,0086 (0,0087)	- 0,0167* * (0,0475)	0,1503* (0,0674)	-0,1120* (0,0475)	1,4890. (0,8938)	0,2838 (0,2409)		3,3340 (2,100)
9	0,2329** (0,0700)	0,1365* (0,0680)	-0,0061 (0,0090)	- 0,0186* * 0,0064	0,1473* (0,0675)	-0,1027* (0,0483)	1,5916. (0,8988)	0,3290 (0,2446)	0,1239 (0,1182)	2,8327 (2,1535)

Source: Authors' calculations

The results of the panel regression of the individual models (Pooling, Fixed Effect, Random Effect, Generalized Method of Moments) are shown in Table 8.

In **Pooling** model, the constant regression term (Intercept) is statistically significant at the 1% level and represents the basic value of the dependent variable when all other variables are equal to zero. The coefficient for GDP is statistically significant at the 5% level, and its increase by 1 unit is associated with an increase in the dependent variable by 0.2105. The coefficients for inflation (HICP) and UR also turned out to be statistically significant at the 10% level, with a positive relationship with the dependent variable. The coefficient for PD and CITR are statistically significant at the 10% level, and in both cases there is a negative relationship with the dependent variable. Trade openness (TO) is statistically significant at the 5% level, with a standard error and a negative relationship with the dependent variable demonstrated. All variables GDP, HICP, PD, TO, UR and CITR show a significant relationship with the dependent variable, with GDP and TO showing the strongest significance.

The results of the **Fixed Effects (FE)** regression model indicate that GDP and HICP have a positive relationship with the dependent variable, but they are not statistically significant. The coefficient of PD is statistically significant at the 5% level, while it is negatively related to the dependent variable. Trade openness and Corporate income tax are statistically significant variables at the 10% level and negatively related to the dependent variable. The unemployment rate showed a positive relationship, which is also statistically significant at the 10% level.

The results from the **Random Effects (RE)** regression model indicate that the intercept is highly significant at the 1% level. This highlights a strong baseline value for the dependent variable when all other variables are zero. The coefficient for GDP is statistically significant at the 5% level, demonstrating a positive and substantial effect on the dependent variable and underscoring the importance of economic growth. In contrast, the coefficient for HICP (Harmonized Index of Consumer Prices) is positive but not statistically significant, suggesting it does not have a meaningful impact on the dependent variable. The coefficients for PD and TO are significant at the 10% level, showing a negative relationship with the dependent variable. Meanwhile, the UR variable exhibits a positive relationship at the 10% significance level. Finally, the CITR variable demonstrates a negative relationship with the dependent variable, also significant at the 10% level. In conclusion, the significant factors in the model include GDP, PD, TO, and CITR. Among these, GDP has the strongest positive impact, while PD shows a notable negative effect. Marginal significance is observed for UR and TO, indicating their weaker but present influence. HICP, however, lacks statistical significance, suggesting a minimal role in explaining variations in the dependent variable. These results emphasize the critical influence of GDP and PD as robust determinants in the model.

Table 8. Summary of Panel regression

	POOLING	FE	RE	GMM
Intercept	6,3934*** (1,3587)		5,8787*** (1,1849)	
lag(INV,1)				0,0828 (0,0982)
GDP	0,2105** (0,0674)	0,1382 (0,1343)	0,1616** (0,0596)	0,2052 (0,1297)
HICP	0,1388* (0,0632)	0,0211 (0,1379)	0,1132 (0,0878)	0,0201 (0,1335)
PD	-0,0160* (0,0076)	-0,0233** (0,0079)	-0,0188* (0,0077)	-0,0228** (0,0075)
TO	-0,0170** (0,0063)	-0,0158* (0,0062)	-0,0143. (0,0074)	-0,0137. (0,0071)
UR	0,1247* (0,0621)	0,1670* (0,0649)	0,1293. (0,0753)	0,1757* (0,0779)
CITR	-0,1213* (0,0475)	-0,1041* (0,0470)	-0,0973* (0,0434)	-0,0917. (0,0482)
Signif. codes: 0,001 '***' 0,01 '**' 0,05 '*' 0,1 '.' 1				

Source: Authors' calculations

The results from the **GMM** model indicate that the investment lag has a positive effect, but it is not statistically significant, indicating that past investment does not significantly affect the dependent variable. Similarly, GDP and HICP show a positive relationship with the dependent variable, although neither is statistically significant. However, the unemployment rate (UR) variable shows a positive and statistically significant relationship at the 5% level, indicating that higher unemployment is associated with increased investment inflows. On the other hand, the PD variable shows a negative and statistically significant relationship, suggesting that an increase in PD leads to a decrease in investment. Trade openness and Corporate Income Tax Rate show marginally significant negative relationships with the dependent variable, indicating weak evidence of their influence. In short, PD and UR are the most significant variables in this model, while the other factors show weaker or no significant effects.

The results of the tests (Table 9) conducted on the econometric model provide a comprehensive assessment of its assumptions and reliability. The F-test for individual effects reveals a p-value of 0.0068, indicating that individual-specific differences, such as those between countries or firms, significantly influence the dependent variable and should be included in the model, typically through fixed or random effects. Similarly, the F-test for time effects, with a p-value of 0.0457, suggests that temporal changes also play a crucial role, emphasizing the importance of accounting for time-related factors in the analysis. The Breusch-Godfrey/Wooldridge test for serial correlation yields a p-value of 0.8093, showing no evidence of significant autocorrelation in the residuals. This is a positive outcome since time series models assume that errors are independent.

Additionally, the Pesaran CD test for cross-sectional dependence provides a p-value of 0.8367, indicating no significant cross-sectional dependence, meaning the units in the sample behave independently, further enhancing the model's reliability. On the other hand, the Breusch-Pagan test for heteroskedasticity, with a p-value of 0.0115, reveals the presence of significant heteroskedasticity, meaning the variance of residuals is not constant across observations. This violates the assumption of homoscedasticity, and we applied robust standard errors to correct this problem. Finally, the Hausman test, with a p-value of 0.1847, suggests that the random effects model is more suitable than the fixed effects model, as there is no evidence of inconsistency in the random effects approach.

Table 9. Summary of Diagnostics

Assumption	Test	P-value	Interpretation
Individual effects	F-test	0,0068	Individual effects are statistically significant.
Time effects	F-test	0,0457	Time effects are statistically significant.
Serial Correlation	Breusch-Godfrey/ Wooldridge test	0,8093	No statistically significant evidence of serial correlation in the idiosyncratic errors.
Cross-sectional dependence	Pesaran CD test	0,8367	No statistically significant cross-sectional dependence.
Heteroskedasticity	studentized Breusch-Pagan test	0,0115	Statistically significant heteroskedasticity.
Model suitability	Hausman	0,1847	The random effects model is suitable for use, as there is no evidence of inconsistency compared to the fixed effects model.

Source: Authors' calculations

5. Discussion

Investment is a cornerstone of economic growth, fostering sustainable development, infrastructure improvement, and innovation. Its fluctuations, driven by internal and external economic factors, make it a dynamic study area. This research examines macroeconomic determinants of foreign direct investment (FDI) across 17 EU countries from 2014 to 2023, using panel regression informed by the Hausman test. GDP growth and the unemployment rate positively and significantly impact FDI, consistent with Alalmai (2024) and Ahmad

& Zhao (2018), highlighting economic growth's critical role. In contrast, public debt and corporate income tax rates negatively influenced FDI, aligning with findings by Marinescu et al. (2019) and Economou (2017). Surprisingly, trade openness showed a significant negative relationship with FDI, suggesting challenges like competition and regulatory barriers. Inflation, however, was not statistically significant, echoing results from Ayeni (2020) and Dang et al. (2020). These findings underscore the importance of economic growth and fiscal prudence in shaping investment environments while highlighting complexities in trade openness and tax policies. This study contributes to understanding FDI determinants and offers insights for policymakers to foster sustainable investment.

6. Conclusion

The results of this study have significant implications for policymakers seeking to foster investment in the EU. First, the positive role of GDP growth highlights the importance of strategies that stimulate economic expansion. Policies that enhance productivity, support innovation, and improve infrastructure can create a favourable environment for investment. Similarly, addressing unemployment through targeted interventions can have the dual benefit of improving labour market conditions and encouraging investment.

On the other hand, the negative effects of public debt and corporate income tax rates underscore the need for prudent fiscal management. Reducing public debt through effective budgetary policies and maintaining competitive tax rates can alleviate barriers to investment. Policymakers must also address the challenges associated with trade openness by fostering a balanced approach that supports both trade and domestic investment. This could involve reducing regulatory barriers, enhancing the competitiveness of domestic industries, and promoting value-added production.

However, this research is not without limitations. The focus on macroeconomic indicators excludes potential microeconomic or sector-specific factors that may influence investment. Additionally, the sample is limited to 17 EU countries due to data availability, which may limit the generalizability of the findings. Future research could address these limitations by incorporating more variables or examining investment patterns within specific sectors. This would provide a more nuanced understanding of the factors driving investment and help tailor policies to the needs of different industries and regions.

In conclusion, investment remains a cornerstone of economic development, and understanding its determinants is essential for effective policymaking. By identifying the key macroeconomic factors influencing investment, this study offers valuable guidance for governments and businesses seeking to promote sustainable growth and innovation. As the global economy evolves, ongoing research and data analysis will be crucial in adapting strategies to new challenges and opportunities.

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