Econometrics project
Determinants of FDI

Dineev Ilshat

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Introduction

In the contemporary global economy, Foreign Direct Investment (FDI) plays a crucial role in shaping the economic landscapes of both emerging and developed nations. This research project explores the various factors that influence FDI, employing panel data sourced from the World Bank Databank to provide a robust analytical framework. The findings of this research will contribute to a deeper understanding of FDI trends and provide valuable insights for policymakers aiming to enhance their countries' attractiveness to international investors.

Literature review

Let's start with reviewing existing literature to define the theoretical background for choosing variables we will consider.

From the IMF Working Paper [1], we can understand that main factors that determine FDI are: Size of the host market (+), Agglomeration effects (+), Business/Investment Climate (+), Openness (+). We can't put most of these factors in the model, so we will apply proxies.

Also from this study we can see that there are some more important factors, such as Economic distance, Factor cost, Fiscal incentives. But there is a problem with regressors, because it is hard to find some consistent proxies for them. So in order to work with endogeneity, talking more precisely, omitted variables, I will add some more control variables that can influence FDI.

Talking about another survey [2] we can see that inflation negatively affects FDI.

From the Federal Reserve Bank of New York [3] we can see that high volatility of the exchange rate reduces FDI.

Also it can be possible to use variables as ease of doing business, but these variables are very strange, so I will not use variables like this

Variables

In my survey I will use the next dependent variable: Foreign direct investment, net inflows (% of GDP).

As the independent variable I will use next variable, some of them are considered of proxies:

1. Country Name

2. Country Code
3. Year
4. Control of Corruption: Estimate (proxy of Business/Investment Climate)
5. Current account balance (% of GDP) (proxy of Economy Openness)
6. GDP growth (annual %)
7. GDP per capita (current US$) (proxy of Market Size)
8. Government Effectiveness: Estimate (proxy of Business/Investment Climate)
9. Individuals using the Internet (% of population) (Agglomeration effect)
10. Inflation, GDP deflator (annual %)
11. Official exchange rate (LCU per US$, period average)
12. Political Stability and Absence of Violence/Terrorism: Estimate (proxy of Business/Investment Climate)
13. Rule of Law: Estimate (proxy of Business/Investment Climate)
14. Unemployment, total (% of total labor force) (modeled ILO estimate)

Hypothesis

In my survey I will suggest next hypotheses:

1. After crisis years FDI will increase
2. “Control of Corruption: Estimate” has positive effect on FDI inflows
3. "Current account balance (% of GDP)" has positive effect on FDI inflows
4. "Labor force with advanced education (% of total working-age population with advanced education)" has positive effect on FDI inflows
5. "Individuals using the Internet (% of population)" has positive effect on FDI inflows
6. "Government Effectiveness: Estimate" has positive effect on FDI inflows
7. "Political Stability and Absence of Violence/Terrorism: Estimate" has positive effect on FDI inflows
8. "GDP per capita (current US$)" has positive effect on FDI inflows”
9. "GDP growth (annual %)" has positive effect on FDI inflows”
10. "Rule of Law: Estimate" has positive effect on FDI inflows”
11. "Inflation, GDP deflator (annual %)” has negative effect on FDI inflows
12. "Unemployment, total (% of total labor force) (modeled ILO estimate)" has negative effect on FDI inflows

Dataset description

In my project I will use data from the World Bank. After exploring the collected dataset, I have chosen years and countries with the smallest numbers of missing values. After that I again made filtration of countries, but in a theoretical sense, to make the representative sample of countries with high, medium and low FDI.

So, my dataset represents next information:

- Time period: 2005 - 2021 (16 years)
- Countries: Germany, United Kingdom, Ireland, Netherlands,

Poland, Belgium, Denmark, Russia, Italy, France, Czech Republic, Spain (13 countries)

Also I needed to remove the Official exchange rate (LCU per US$, period average) variable, because it has 70% of missing values, so they can't be imputed or interpolated.

Multicollinearity

Before we start, we need to remove practically strictly correlated variables for next reasons:

1. Because of them we get singular matrices

2. They ruin assumptions in models for panel data.

It's very important to mention that I don't remove all highly correlated variables, only those that are close to strict correlation.

Let's perform VIF tests and get next results:

	feature	VIF
0	const	61.02
1	Control of Corruption: Estimate	23.12
2	Current account balance (% of GDP)	1.52
3	GDP growth (annual %)	1.17
4	GDP per capita (current US$)	3.11
5	Government Effectiveness: Estimate	17.80
6	Individuals using the Internet (% of population)	1.95
7	Inflation, GDP deflator (annual %)	2.39
8	Political Stability and Absence of Violence/Te...	3.29
9	Rule of Law: Estimate	32.72
10	Unemployment, total (% of total labor force) (...	1.44

As we can see from this table, we have 3 variables with high VIF:

1. Government Effectiveness: Estimate
2. Rule of Law: Estimate
3. Control of Corruption: Estimate

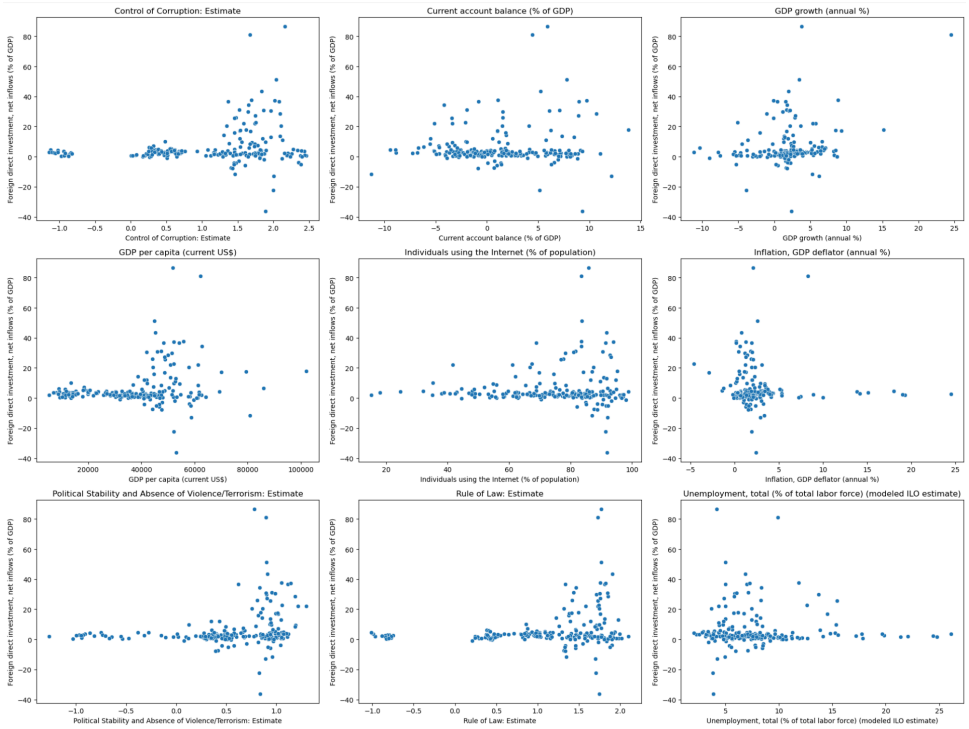
Let's try to delete one of them and look at the result:

	feature	VIF
0	const	54.71
1	Current account balance (% of GDP)	1.31
2	GDP growth (annual %)	1.17
3	GDP per capita (current US$)	2.62
4	Government Effectiveness: Estimate	3.99
5	Individuals using the Internet (% of population)	1.90
6	Inflation, GDP deflator (annual %)	2.39
7	Political Stability and Absence of Violence/Te...	2.70
8	Unemployment, total (% of total labor force) (...	1.34

As we can see, now we have normal VIF for variables. Actually, without deleting this variable, there would be a singular covariance matrix without full rank.

Data visualization

From most plots we can see that there are mostly linear relationships between dependent and independent variables. However, for some variables we can't define the type of dependence.



Choose of functional forms

As we can see from visualization, most variables have a linear relationship. Now let's discuss the theoretical aspect.

In my model I left practically all variables in the linear form, because I don't see any theoretical reason to change them. For example, many economic theories consider the linear relationship between investments and economic factors (Sollow economic growth model, International trade and investment theory). That's why I will leave Foreign direct investment, net inflows (% of GDP) without any transformation

The only variable that I will transform is GDP growth (annual %). I will apply cubic transformation to it, as from empirical experience we know that fast growth of the economy attracts investors very much, and the more the growth, the more investments the country will attract.

Before choosing model

Before we will start building models, I want to make some preventive rules for modeling.

First of all, we assume heteroscedasticity, autocorrelation and endogeneity because of the missing variables and missing specification (functional forms). All these problems will be discussed later, but I will now apply robust errors and GLS instead of OLS, to get correct standard errors and more effective estimators, to provide correct tests while choosing models.

Hypothesis on model

When we work with panel data, we can use 3 models:

1. Pull regression
2. Fixed effect model
3. Random effect model

Also there can be a fixed model when we fix only one or all variables(two sided). My hypothesis is that in this survey the best model will be a two-sided fixed effect model, because factors such as the financial crisis and reputation of a country have a huge impact on FDI. Also I think that the random effect model won't be the best because in our case individual features of countries are correlated with explanatory variables.

Tests on the best models.

So, our starting model is next:

$$Foreign\ direct\ investment,\ net\ inflows\ (\%\ of\ GDP) = \beta 0 + \beta 1 \times Current\ account\ balance\ (\%\ of\ GDP) + \beta 2 \times GDP\ growth\ (annual\ \%)^3 + \beta 3 \times GDP\ per\ capita\ (current\ US\$) + \beta 4 \times Individuals\ using\ the\ Internet\ (\%\ of\ population) + \beta 5 \times Inflation,\ GDP\ deflator\ (annual\ \%) + \beta 6 \times Political\ Stability\ and\ Absence\ of\ Violence/Terrorism:\ Estimate + \beta 7 \times Rule\ of\ Law:\ Estimate + \beta 8 \times Unemployment,\ total\ (\%\ of\ total\ labor\ force) + Country\ Effects + Year\ Effects + \epsilon$$

Pool regression

Now let's compare it with Pool Regression - the same model but without Country and Year Effects.

From F-test for Restricted and Unrestricted model we have:

F-statistic: 4.546185506159124, p-value: 4.3683978656616773e-10

So, we obviously reject H0, and conclude that the FE model has better explanatory power.

FE model on year

Let's provide an F-test on two sided FE models and FE models with only year fixed. We have next results:

F: 7.28 Pr(>F): 0.00 -> we reject H0 -> including Countries effects gives better explanatory power

FE model on Country

Now include only the effect of Country. We have next results from F-test:

F: 2.57 Pr(>F): 0.00 -> we reject H0 -> including Year effects gives better explanatory power

Random Effect model

Now let's compare our two-way FE model with the RE model. The null hypothesis of the Hausman test posits that the estimators in the random effects model are consistent and unbiased, assuming no correlation between the regressors and the unobserved effects. If we reject H0, then the FE model is more effective. In the result of test we get next result:

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Hausman statistic: 32.250862593823776
Degrees of freedom: 9
p-value: 0.00018018990080348463
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We reject H0 at 5% significance level -> RE model is not consistent -> that means that FE model is more effective

So, for our survey we choose a two sided FE model as the best, based on the tests provided above. Now let's discuss the problems of this model.

Heteroscedasticity

We won't provide any test for heteroscedasticity, we assume that we have it in our model by default. This feature makes estimators of standard deviation inconsistent, so we can't provide tests. To solve this problem we introduced robust standard before

Autocorrelation

We also assume that we have this problem, it makes our OLS estimators less efficient and SE of estimators not consistent. So to increase efficiency we applied GLS instead of OLS to our model, and used robust errors to avoid inconsistent SE.

Endogeneity

Endogeneity makes our estimators inconsistent. There can be several reasons for endogeneity. First of all, there are omitted variables. Of course we don't know the real model, so we can't remove this factor at all. But we can decrease by introducing control variables, which will decrease variance and decrease omitted variable bias.

Another reason for endogeneity is specification error. To solve this problem, I introduced functional forms of my variables based on their visual and theoretical analysis.

Also to solve the endogeneity problem I used dummy variables for the fixed effects model.

One more way to overcome endogeneity is to use instrumental variables. For example for GDP per capita IV can be Natural Resources Rent and Energy Production.

Final model

All in all, we get next FE two-way model with GLS and Robust Errors:

GLS Regression Results

Dep. Variable:	Q("Foreign direct investment, net inflows (% of GDP)")	R-squared:	0.557
Model:	GLS	Adj. R-squared:	0.465
Method:	Least Squares	F-statistic:	39.39
Date:	Fri, 17 May 2024	Prob (F-statistic):	5.30e-64
Time:	18:51:15	Log-Likelihood:	-726.20
No. Observations:	204	AIC:	1524.
Df Residuals:	168	BIC:	1644.
Df Model:	35		
Covariance Type:	HC1		

	coef	std err	z	P>|z|	[0.025	0.975]
Intercept	22.6175	11.404	1.983	0.047	0.266	44.969
C(Country_Code)[T.CZE]	-13.4469	5.395	-2.492	0.013	-24.021	-2.872
C(Country_Code)[T.DEU]	-9.4993	4.308	-2.205	0.027	-17.942	-1.056
C(Country_Code)[T.DNK]	-4.0552	4.952	-0.819	0.413	-13.761	5.651
C(Country_Code)[T.ESP]	-9.2818	4.768	-1.947	0.052	-18.627	0.063
C(Country_Code)[T.FRA]	-5.3672	3.557	-1.509	0.131	-12.339	1.605
C(Country_Code)[T.GBR]	-4.1857	3.991	-1.049	0.294	-12.008	3.637
C(Country_Code)[T.IRL]	25.9851	6.217	4.180	0.000	13.801	38.169
C(Country_Code)[T.ITA]	-9.6499	6.615	-1.459	0.145	-22.616	3.316
C(Country_Code)[T.NLD]	10.3494	7.837	1.321	0.187	-5.011	25.709
C(Country_Code)[T.POL]	-18.3784	6.484	-2.834	0.005	-31.087	-5.670
C(Country_Code)[T.RUS]	-43.1597	14.973	-2.883	0.004	-72.506	-13.814
C(Year)[T.2006]	-0.3480	2.560	-0.136	0.892	-5.366	4.670
C(Year)[T.2007]	5.1616	4.715	1.095	0.274	-4.080	14.403
C(Year)[T.2008]	-0.8469	4.052	-0.209	0.834	-8.789	7.095
C(Year)[T.2009]	-7.4261	3.667	-2.025	0.043	-14.613	-0.239
C(Year)[T.2010]	-8.3676	4.269	-1.960	0.050	-16.735	5.61e-05
C(Year)[T.2011]	-5.5042	4.971	-1.107	0.268	-15.248	4.239
C(Year)[T.2012]	-10.6141	4.591	-2.312	0.021	-19.612	-1.616
C(Year)[T.2013]	-10.2004	5.126	-1.990	0.047	-20.247	-0.153
C(Year)[T.2014]	-11.6277	5.337	-2.179	0.029	-22.088	-1.167
C(Year)[T.2015]	-14.8128	6.491	-2.282	0.022	-27.535	-2.090
C(Year)[T.2016]	-13.1658	6.576	-2.002	0.045	-26.054	-0.278
C(Year)[T.2017]	-18.1458	6.681	-2.716	0.007	-31.240	-5.052
C(Year)[T.2018]	-23.6880	9.866	-2.401	0.016	-43.026	-4.351
C(Year)[T.2019]	-22.9407	7.322	-3.133	0.002	-37.291	-8.591
C(Year)[T.2020]	-22.6270	9.133	-2.477	0.013	-40.528	-4.726
C(Year)[T.2021]	-22.2429	9.026	-2.464	0.014	-39.934	-4.552
Q("Current account balance (% of GDP)")	0.7099	0.318	2.230	0.026	0.086	1.334
I(Q("GDP growth (annual %)") ** 3)	0.0041	0.000	11.199	0.000	0.003	0.005
Q("GDP per capita (current US$)")	-0.0005	0.000	-4.133	0.000	-0.001	-0.000
Q("Individuals using the Internet (% of population)")	0.4824	0.190	2.533	0.011	0.109	0.856
Q("Inflation, GDP deflator (annual %)")	-0.1379	0.200	-0.691	0.490	-0.529	0.254
Q("Political Stability and Absence of Violence/Terrorism: Estimate")	-4.5398	4.519	-1.005	0.315	-13.396	4.316
Q("Rule of Law: Estimate")	-9.0910	6.004	-1.514	0.130	-20.859	2.677
Q("Unemployment, total (% of total labor force) (modeled ILO estimate)")	-0.4499	0.229	-1.968	0.049	-0.898	-0.002

Omnibus:	55.039	Durbin-Watson:	1.359
Prob(Omnibus):	0.000	Jarque-Bera (JB):	1069.511
Skew:	0.330	Prob(JB):	5.74e-233
Kurtosis:	14.198	Cond. No.	2.09e+06

Interpretation

We will interpret only variables that are significant at 5% level. Remember that the baseline for our dummy variables are Belgium for Country and 2005 Year for Years.

Intercept (22.6175, p = 0.047): This suggests that for Belgium in the year 2005, the baseline level of foreign direct investment (FDI) inflows as a percentage of GDP is estimated at 22.6175%, when all other variables are held at zero.

Country_Code[T.CZE] (-13.4469, p = 0.013): If a country is the Czech Republic, compared to Belgium, FDI inflows as a percentage of GDP decrease by 13.4469 percentage points, holding all other factors constant. The Czech Republic, despite its robust industrial base, particularly in manufacturing, may attract less FDI as a percentage of GDP compared to Belgium due to its smaller market size and less diverse economy. Belgium's strategic location and role as a key EU hub, coupled with advantageous tax and corporate incentives, make it more attractive for FDI. Moreover, the Czech Republic's focus on specific sectors like automotive manufacturing might not be as appealing for the broader scope of investments that find Belgium's diverse economy attractive.

Country_Code[T.DEU] (-9.4993, p = 0.027): If a country is Germany, compared to Belgium, FDI inflows as a percentage of GDP decrease by 9.4993 percentage points, holding all other factors constant. Germany, being Europe's largest economy, receives significant FDI in absolute terms, but this represents a smaller proportion of its large GDP compared to Belgium. High operational costs and a saturated market with rigorous regulatory standards might deter the proportionate FDI inflows seen in smaller, more flexible economies like Belgium. Germany's focus on domestic capabilities and investment also lessens its reliance on foreign direct investment compared to more centrally positioned and multilingual hubs like Belgium.

Country_Code[T.IRL] (25.9851, p = 0.000): When comparing Ireland to Belgium, if all other variables are held constant, FDI inflows as a percentage of GDP in Ireland are higher by approximately 25.9851 percentage points. They have such a high positive coefficient because Ireland has low taxes for foreign companies, especially for IT one: they have big offices of Google and Facebook. Also many airline companies are registered in Ireland, it is

English-speaking country and they government interested in attraction of FDI, that's why they have such big share of them

Country_Code[T.POL] (-18.3784, p = 0.005): When comparing Poland to Belgium, if all other variables are held constant, FDI inflows as a percentage of GDP in Poland are lower by approximately 18.3784 percentage points. Poland's lower FDI inflows relative to its GDP compared to Belgium might be influenced by its transition economy status and perceived higher risks and lower economic openness at the time. Such factors could detract from Poland's ability to attract investment in proportion to its GDP.

Country_Code[T.RUS] (-43.1597, p = 0.004): When comparing Russia to Belgium, if all other variables are held constant, FDI inflows as a percentage of GDP in Russia are lower by approximately 43.1597 percentage points. The substantial reduction in Russia's FDI inflows as a percentage of GDP could be due to geopolitical risks, economic sanctions, and lower transparency in business practices. These factors make Russia less attractive for investors relative to the size of its economy.

Year[T.2009] (-7.4261, p = 0.043): For the year 2009, compared to the baseline year of 2005, FDI inflows as a percentage of GDP decreased by 7.4261 percentage points, holding all other factors constant.

Year[T.2010] (-8.3676, p = 0.050): For the year 2010, compared to the baseline year of 2005, FDI inflows as a percentage of GDP decreased by 8.3676 percentage points, holding all other factors constant.

Years 2009 to 2010: The impact of the global financial crisis in 2008 and its aftershocks led to a sharp reduction in FDI inflows across many economies. As businesses and investors pulled back due to increased economic uncertainty and risk, countries experienced a significant downturn in investment relative to their GDPs.

Year[T.2012] (-10.6141, p = 0.021): For the year 2012, compared to the baseline year of 2005, FDI inflows as a percentage of GDP decreased by 10.6141 percentage points, holding all other factors constant.

Year[T.2013] (-10.2004, p = 0.047): For the year 2013, compared to the baseline year of 2005, FDI inflows as a percentage of GDP decreased by 10.2004 percentage points, holding all other factors constant.

Year[T.2014] (-11.6277, p = 0.029): For the year 2014, compared to the baseline year of 2005, FDI inflows as a percentage of GDP decreased by 11.6277 percentage points, holding all other factors constant.

Year[T.2015] (-14.8128, p = 0.022): For the year 2015, compared to the baseline year of 2005, FDI inflows as a percentage of GDP decreased by 14.8128 percentage points, holding all other factors constant.

Year[T.2016] (-13.1658, p = 0.045): For the year 2016, compared to the baseline year of 2005, FDI inflows as a percentage of GDP decreased by 13.1658 percentage points, holding all other factors constant.

Year[T.2017] (-18.1458, p = 0.007): For the year 2017, compared to the baseline year of 2005, FDI inflows as a percentage of GDP decreased by 18.1458 percentage points, holding all other factors constant.

Year[T.2018] (-23.6880, p = 0.016): For the year 2018, compared to the baseline year of 2005, FDI inflows as a percentage of GDP decreased by 23.6880 percentage points, holding all other factors constant.

Years 2012 to 2018: This period covers the European debt crisis and subsequent economic stagnation in many parts of the world, particularly affecting the Eurozone. These events likely deterred foreign investment due to concerns over economic stability and profitability, contributing to a steady decline in FDI as a percentage of GDP.

Year[T.2019] (-22.9407, p = 0.002) to Year[T.2021] (-22.2429, p = 0.014): For each year from 2019 to 2021 compared to the base year of 2005, FDI inflows as a percentage of GDP are lower by 22.9407 to 22.2429 percentage points, respectively, assuming all other variables are held constant. The negative coefficients for these years suggest that external shocks like the COVID-19 pandemic significantly reduced the economic activities that

typically attract FDI, resulting in lower FDI relative to the GDP. These years saw global economic downturns that impacted the proportion of new investments in the economy.

Current account balance (% of GDP) (0.7099, p = 0.026): For every one percentage point increase in the current account balance as a percentage of GDP, FDI inflows as a percentage of GDP increase by approximately 0.7099 percentage points, when other factors are controlled. A positive current account balance, indicating more exports than imports or less reliance on external financing, typically enhances a country's attractiveness to foreign investors. A surplus suggests an economically stable environment, boosting confidence in the country's ability to generate returns on investments relative to its economic size.

GDP growth (annual %)^3 (0.0041, p = 0.000): For every one-unit increase in the cube of the annual GDP growth rate, FDI inflows as a percentage of GDP increase by approximately 0.0041 percentage points, assuming other variables are constant. Exponential growth in GDP indicates not only a growing economy but also expanding market opportunities. Such dynamic growth can disproportionately attract FDI, as investors seek to capitalize on rapid economic expansion relative to the overall GDP.

GDP per capita (current US$) (-0.0005, p = 0.000): For every one dollar increase in GDP per capita, FDI inflows as a percentage of GDP decrease by approximately 0.0005 percentage points, with all other variables held constant. Higher GDP per capita might imply a higher cost of doing business and potentially saturated markets, which could deter FDI when considered relative to the overall economic output. This might suggest that while the economy is wealthier, it is less dependent on or attractive for new foreign investments relative to its GDP.

Individuals using the Internet (% of population) (0.4824, p = 0.011): For every one percentage point increase in the proportion of individuals using the Internet, FDI inflows as a percentage of GDP increase by approximately 0.4824 percentage points, assuming other factors are controlled. High internet penetration is indicative of a technologically advanced and connected economy, which attracts investments in sectors like services, IT, and telecommunications. Increased connectivity enhances business processes and market access, making such economies more attractive for FDI relative to their GDP.

Unemployment, total (% of total labor force) (modeled ILO estimate) (-0.4499, p = 0.049): For every one percentage point increase in the unemployment rate, FDI inflows as a percentage of GDP decrease by approximately 0.4499 percentage points, when other variables are held constant. Higher unemployment rates may reflect underutilization of labor resources and economic inefficiencies, which can negatively impact the perception of an economy's ability to sustain new investments relative to its GDP.

Reasons for non significance of variables

C(Year)[T.2011] (p = 0.268). The year 2011 did not show a significant deviation in FDI inflows as a percentage of GDP compared to the baseline year of 2005, possibly reflecting a recovery phase post-global financial crisis where FDI patterns began to stabilize. The statistical insignificance may also indicate that any changes during 2011 were not distinct enough across the countries in the sample, or were overshadowed by larger economic trends not specific to that year.

Q("Inflation, GDP deflator (annual %)") (p = 0.490). Inflation rates, as measured by the GDP deflator, may not have a straightforward or uniform impact on FDI inflows. Investors might consider inflation within the context of other macroeconomic indicators, thus diluting its isolated effect. The high p-value suggests that inflation, by itself, does not significantly affect the proportion of GDP represented by FDI, possibly because moderate inflation rates within the observed range are viewed as a normal economic condition by investors.

Q("Political Stability and Absence of Violence/Terrorism: Estimate") (p = 0.315). This measure may not have shown significant effects due to the complexity of how political stability influences investment decisions, which often depends on investor perception and specific sectors vulnerable to instability. The model's inability to establish significance might also be due to variations in the political context not being drastic enough within the countries and period studied, or because other economic factors were more influential during the times covered.

Q("Rule of Law: Estimate") (p = 0.130). The rule of law is fundamentally important for creating a secure investment environment; however, its effect might not be immediately

observable in FDI percentages due to the long-term nature of legal reforms and their assimilation into the business climate. The lack of significance could suggest that variations in this variable across the sample were not sufficiently contrasted, or that FDI is influenced by a broader set of institutional factors where the rule of law is just one component.

C(Country_Code)[T.DNK] (p = 0.413). Denmark's economic environment and investment climate may be quite similar to Belgium's, which could explain the lack of significant difference in FDI inflows as a percentage of GDP between the two countries. The high p-value suggests that either Denmark does not differ enough from Belgium in attracting FDI, or the model may need adjustments for other influencing factors not captured in the current dataset.

C(Country_Code)[T.ESP] (p = 0.052). Spain's economic crises and recovery phases might not distinctly impact FDI inflows in a way that significantly differs from Belgium, likely due to similar investor perceptions and economic policies. The p-value close to the threshold indicates a potential edge of significance, suggesting that minor variations in data collection or model specification could alter this result.

C(Country_Code)[T.FRA] (p = 0.131). France's economic structure and policies might be closely aligned with Belgium’s, leading to no significant differences in their percentages of FDI inflows. Economically, France and Belgium are both core EU countries with robust economies, which might dilute noticeable differences in FDI patterns, reflected in the model's inability to find significant differences.

C(Country_Code)[T.GBR] (p = 0.294). The UK's economic and political stability, similar to Belgium's, likely results in comparable FDI inflow patterns as a percentage of GDP, minimizing noticeable differences. Statistically, the insignificance could be due to the model not capturing other variables that uniquely affect the UK, such as Brexit-related changes not reflected in the period studied.

C(Country_Code)[T.ITA] (p = 0.145). Italy’s economic challenges, including higher public debt and political instability, may not have been distinct enough in their impact on FDI inflows compared to Belgium to reach statistical significance. The lack of significance might

also indicate the need for a more nuanced analysis that accounts for sector-specific investments or regional economic conditions within Italy.

C(Country_Code)[T.NLD] (p = 0.187). The Netherlands shares many economic traits with Belgium, including strong EU integration and similar regulatory environments, which may explain why FDI inflows as a percentage of GDP are not significantly different. The p-value suggests that existing differences in economic size or sectoral focus between the countries are not captured adequately by the model.

Checking Hypothesis

After crisis years, FDI will increase: The data does not support this hypothesis, as evidenced by significant negative coefficients for years following economic downturns (e.g., 2009 onward), indicating a decrease in FDI as a percentage of GDP.

“Control of Corruption: Estimate” has a positive effect on FDI inflows: I excluded this variable from model because of strict multicollinearity

"Current account balance (% of GDP)" has a positive effect on FDI inflows: Supported by the model results, with a positive coefficient (0.7099, p = 0.026), indicating that a higher current account balance is associated with increased FDI inflows as a percentage of GDP.

"Individuals using the Internet (% of population)" has a positive effect on FDI inflows: Supported by the model, where the coefficient (0.4824, p = 0.011) indicates that higher internet usage positively correlates with higher FDI inflows as a percentage of GDP.

"Government Effectiveness: Estimate" has a positive effect on FDI inflows: I excluded this variable from model because of strict multicollinearity

"Political Stability and Absence of Violence/Terrorism: Estimate" has a positive effect on FDI inflows: Not supported by the model, where the variable is not significant (p = 0.315), suggesting no clear correlation between political stability and FDI inflows.

"GDP per capita (current US$)" has a positive effect on FDI inflows: Contradicted by the model results, which show a significant negative effect (-0.0005, p = 0.000), indicating that higher GDP per capita is associated with lower FDI inflows as a percentage of GDP.

"GDP growth (annual %)" has a positive effect on FDI inflows: Supported by the model, with a highly significant positive coefficient for GDP growth cubed (0.0041, p = 0.000), suggesting strong positive effects from GDP growth on FDI inflows.

"Rule of Law: Estimate" has a positive effect on FDI inflows: Not supported by the model, as the variable's coefficient is not significant (p = 0.130), showing no clear influence on FDI inflows.

"Inflation, GDP deflator (annual %)" has a negative effect on FDI inflows: Not supported by the model, where the variable's coefficient is not significant (p = 0.490), indicating that inflation as measured by the GDP deflator does not significantly impact FDI inflows.

"Unemployment, total (% of total labor force) (modeled ILO estimate)" has a negative effect on FDI inflows: Barely supported by the model with a significant negative coefficient (-0.4499, p = 0.049), suggesting that higher unemployment rates are associated with lower FDI inflows as a percentage of GDP.

Reasons for unexplained variances

My model has R-squared = 0.557, what is quite good, but there is still some part of unexplained variance. Let's name reasons for that:

1. Omitted variables. As we can't know the real model, there will be variance caused by this problem. To solve this problem, I included control variables to our model. Also it is possible to introduce instrumental variables
2. Using proxy variables. It is impossible to get such variables as size of economy or country development. That's why I used proxy variables which also increase variance.

3. Non-measurable factors. Such factors as history of a country, its authority and etc. can't be used in the model, however they also affect FDI and their absence increases unexplained variance.
4. Model specification. Incorrect functional forms also impact variance.

Conclusion

In conclusion I can say I provided a very interesting and complex survey on the theme of determinants of FDI. I collected panel data by myself, provided tests and found the best model. After that I assessed the model, interpreted results and gave theoretical background for them. Also I explained problems of the models and suggested ways to improve

Literature

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