

# THE RELATIONSHIP AMONG MACROECONOMIC INDICATORS AND FOREIGN DIRECT INVESTMENTS IN GREECE, CYPRUS, PORTUGAL AND IRELAND: A STRATEGIC OUTLOOK

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## Abstract

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The main purpose of undertaking this study is to examine the relationship between macroeconomic variables and foreign direct investments. The study includes a statistical analysis of the relationship between macroeconomic indicators on one hand, and foreign direct investment on the other (Roukanas, 2020), for the period 2010–2015, in Greece, Cyprus, Portugal, and Ireland. The aforementioned analysis focused on European Union (EU) member states that were hit by the global economic recession and received assistance from the Institutions. The criterion for their selection was the implementation of fiscal adjustment programmes with the aim of enabling their stabilisation and recovery. The data that will be used were drawn from the statistical databases of the EU, where official data are published and processed with the use of the Stata statistical software. Initially, various combinations of models were explored and the most appropriate ones were selected. These selected models show the dependent variables to be dynamically influenced by the independent variables and provide an opportunity for future research to enrich the model with additional interdependent variables showing variations in the findings.

**Keywords:** Foreign Direct Investment, FDI, Gross Domestic Product, GDP, Inflation, Unemployment, Stata

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## 1. INTRODUCTION

During the period 2008–2009, there suddenly appeared, all over the world, economic distress, which was the greatest in intensity since the end of the Second World War. The beginning of 2009 was

characterized by a downward trend in the gross domestic product (GDP) in the industrialized countries by 4.5% and by 8.4% of the average growth rate of the real GDP in the emerging economies. At the same time, according to Organisation for Economic Co-Operation and Development (OECD)

surveys, the unemployment rate increased and reached 9%, while in industrialized and developing countries this rate was in double digits (OECD, 1996, 2009). Also noteworthy is that the volume of world trade showed a decline of more than 40% in the last six months of 2008, which was greater than the decline in total output (Alfaro & Chen, 2010).

The severity of this predicament has led many economists to investigate the macroeconomic patterns and causes of the crisis. Rose and Spiegel (2009), for example, investigated the role of trade and economic linkages in explaining the difference in the extent of the crisis across countries. Eaton et al. (2009) and Chor and Manova (2009), among others, examined the possible causes of the massive trade collapse, a phenomenon that received particular attention during the recent crisis and tried to demonstrate, respectively, that the construction of supply and demand conditions played an important role.

In 2008, international sales fell by 4.6%, in sharp contrast to the 24% growth rate the previous year (United Nations Conference on Trade and Development [UNCTAD], 2009). Similarly, the growth rate of foreign affiliates' output decreased from 4.4% in 2008. Foreign affiliates' exports — which, compared to other indicators, were at a very good level — showed a strong growth rate of 15%, even amid the collapse of global trade. These observations indicate that multinational corporations (MNCs) are likely to exhibit a complex pattern of crisis responses (Alfaro & Chen, 2010).

Alfaro et al. (2010) pointed out the positive effect of foreign direct investments (FDI) on economic development, emphasizing the importance of local financial markets in this process. Furthermore, these results are confirmed by a series of studies that analysed countries from different parts of the world (Dornean et al., 2012).

Studying the course of the world economy is a means of understanding the main economic challenges that the world's largest economies will face in the context of economic globalisation. The macroeconomic indicators used are mainly "GDP, GDP per capita, GDP growth rate, inflation, unemployment rate, current account balance, the trade balance, the public debt as a percentage of GDP, and general government borrowing" (Roukanas, 2020, p. 71). Adjustment programmes bring about a balance that allows a country to recover. Moreover, FDI is an alternative that enables a country to improve its macroeconomic aggregates.

Therefore, the main purpose for undertaking this study is to examine the relationship between these two concepts during the period of the economic crisis and detect the optimum solution for countries suffering from severe economic recessions.

The study includes a statistical analysis of the relationship between GDP, the unemployment rate, and inflation on one hand, and FDI on the other, for the period 2010–2015, in Greece, Cyprus, Portugal, and Ireland. Data analysis is used to explore the relationship between FDI on one hand, and GDP, unemployment, and inflation, on the other. The main question of this study is the relationship of FDI with various fiscal and structural adjustment programmes, and more specifically, whether FDI is affected by the conditions created by these programmes. The time periods analysed are from 2010 to 2015, i.e., the period of time when

the adjustment programmes were implemented in European Union (EU) countries.

Also, it was found that the analyses and studies so far are fragmentary and cannot be generalized, nor applied exclusively and individually. An additional purpose of this work that makes it original is the effort to fill the aforementioned gap. Through a multifaceted approach, the use of tools and theories of economic science, and through impact analysis and empirical investigation, an attempt is made to determine the role and effects of FDI in dealing with economic recession and exiting suffocating programmes adjustment.

Finally, the paper investigates whether, according to the quantitative analysis model, safe conclusions can be drawn for future movements of FDI, but also which of the macroeconomic indicators of the model has a greater influence on FDI and in which direction.

The rest of the paper is structured as follows. Section 2 examines the pertinent literature concerning FDI, GDP, inflation, unemployment and structural adjustment programmes (SAP). Section 3 examines the methods utilized to undertake empirical research on the questions of the study. Section 4 discusses the empirical findings. Section 5 concludes with a discussion of the study's findings, limitations, and suggestions for further research.

## 2. LITERATURE REVIEW

There are numerous types of papers on the global economy, with many of them focusing on macroeconomic indicators. In this section, the concepts of macroeconomic indicators that will be used in this paper will be presented in order to make it easier to complete the research.

### 2.1. Foreign direct investment

Some international economic organizations have formulated a multitude of definitions for FDI. Thus, the International Monetary Fund (IMF, 1977) defines FDI as follows: "investment that is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor, the investor's purpose being to have an effective voice in the management of the enterprise" (p. 136).

Moreover, the OECD (1996) defines FDI by focusing on its main objective, which is to acquire a lasting interest from a resident ("direct investor") in an economy different from that in which the investor operates ("direct investment business"). The benefit presupposes the existence of a long-term relationship, which is two-way but also largely related to the management of the business. The direct investment includes both the initial transaction between the two entities, as well as all subsequent capital transactions between them and at the same time between the associated enterprises, both joint stock and non-stock corporations (Huang, 2002).

Economic theory shows that FDI has a beneficial effect on both the host country and the country making the investment (Hayes, 2024). The type of FDI has advantages as human capital development, exchange rate stability, and improved capital flow, and also has disadvantages such as the hindrance of domestic investment and expropriation (Calimanu, 2021). It is worth

mentioning that the strengthening of the tax complexity difference between the source country and the destination country is associated with an increase in FDI outflows from the country of origin to the country of destination (Esteller-Moré et al., 2021). While it may be true that outward FDI leads to job losses and inward FDI leads to job gains, it is a short-term assumption, which is not a reality given a long-term dynamic perspective (Stepanok, 2023).

Additionally, a downturn in foreign investments might be caused by high levels of inflation. High levels of inflation can lead to a depreciation of the local currency, risking reductions in the value of assets pegged to the local currency relative to foreign currencies (Takefman, 2022).

## 2.2. Gross domestic product

According to the OECD (2009), “GDP is the standard measure of the value of final goods and services produced by a country during a period” (p. 16). Although GDP is the single most important indicator for capturing and measuring these economic activities, it is not the key measure to fully capture the well-being of societies. Rather, it is a limited measure of people’s material standard of living.

Since countries calculate GDP in their own currencies, in order to compare these indicators across countries, these estimates should be converted into a common currency. This conversion is mostly done using current exchange rates, which may nonetheless “give a misleading comparison of the true volumes of final goods and services in GDP” (OECD, 2009, p. 16).

A better approach is to use purchasing power parity (PPP) rates. These rates are “currency converters that control for differences in the price levels of products between countries and so allow an international comparison of the volumes of GDP and of the size of economies” (OECD, 2009, p. 16).

Although all OECD countries now follow the 1993 System of National Accounts, in some countries, for example in specific sectors such as software production or own-account financial intermediation in services (indirect measures), differences remain, which can affect GDP comparisons (OECD, 2009).

Measuring the unobserved economy (often referred to as the informal or grey economy) may also have an impact on comparability, although generally for OECD economies this is not considered a significant fact (OECD, 2009).

Changes in the size of economies are usually measured by changes in the volume (often referred to as real volume) of GDP. The use of the term “real” reflects the fact that changes in GDP brought about by inflation are not taken into account. This provides a measure of changes in the volume of output of an economy (OECD, 2009).

The conversion of the nominal GDP values to real ones presupposes a set of detailed price indicators, indirectly or directly collected. When applied to the face value of trades, corresponding volume changes can be recorded. The detailed volume changes for goods and services are then added together to yield an overall change in GDP volume. In the past, most countries used fixed weights for this concentration and the base year changed every five to ten years (OECD, 2009).

It is important to recognize that growth rates are not invariant to the choice of this reference period and growth measures could prove to be non-data and valid for reference years that were far from the base year (OECD, 2009).

## 2.3. Inflation

Inflation is one of the most important macroeconomic variables. According to Pantelidis and Giannelis (2014), “inflation is the continuous tendency to increase the general level of prices in the economy” (p. 570). Inflation could be characterized as a quite risky variable, according to the way it changes, that is, regarding the extent of the change, the period of the change, and its duration. The phenomenon of inflation may have an adverse influence on the structure of production costs and the level of welfare; more specifically, its effects may include instability, reduced economic growth, reduction of competitiveness, increase in interest rates, unequal distribution of income, and unemployment. At the same time, it is known that inflation reduces the value of money, i.e., the purchasing power of money decreases (Pantelidis & Giannelis, 2014).

Inflation presents itself as a problem when it is not properly forecasted. Thus, inflation can be distinguished into expected and unexpected inflation, where expected is inflation that has been correctly predicted, while in the case of unexpected inflation, the opposite is the case. Also, two types of inflation are demand-pull inflation and cost-pull inflation. In the first case, inflation is the result of an increase in aggregate demand, while in the second case, it is the result of an increase in the cost of production. In periods where inflation increases very quickly and at sufficiently large values, the phenomenon of hyperinflation is observed, while in cases where there is simultaneous inflation and unemployment at the same level, we have the phenomenon of stagflation (Pantelidis & Giannelis, 2014).

## 2.4. Unemployment

Unemployment is a social and economic phenomenon, in which a part of the economically active population cannot provide their work. According to Pantelidis and Giannelis (2014), “unemployment is the situation in which part of the population finds itself without employment, which it seeks in the current salary” (p. 540). Unemployment is usually determined by sample means. Unemployment is a phenomenon that can hardly be avoided in the economic cycle of the market because it is related to market supply and demand and it is very difficult to balance these two factors perfectly. At the same time, the duration and frequency of unemployment are points of study because for an economy, the problem will not only be the level of unemployment but also how much of it persists and how often it appears despite the efforts made to deal with it.

Unemployment can be divided into three types: 1) frictional unemployment, which is due to the normal and expected movement of the labour force; 2) structural unemployment, which is due to the reduction of jobs because of the contraction in productive activity; and 3) cyclical unemployment,

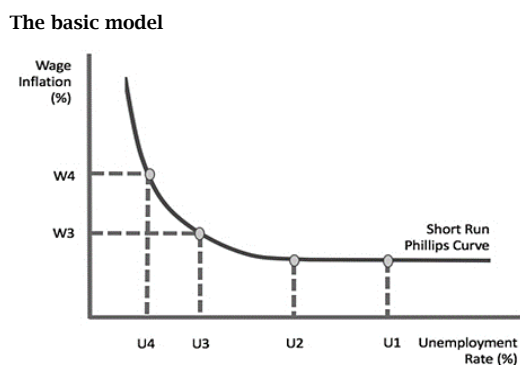
which is due to a recession or the slowdown in the growth rate (Pantelidis & Giannelis, 2014, pp. 545–547). All three types of unemployment can arise from the existence of various factors. Such factors are the changes in production technology and product development, phenomena that occur worldwide, changes in consumer standards, and also the lack of demand for the qualifications and specialities of workers, resulting in some professions falling out of demand (Pantelidis & Giannelis, 2014, pp. 546–550).

## 2.5. Relationship between inflation and unemployment

The relationship between inflation and unemployment can be illustrated with the use of a diagram. This correlation is shown as a Phillips curve. The Phillips curve is a graphical representation of the estimated relationship between inflation and unemployment (Pantelidis & Giannelis, 2014, p. 595). English economist William Phillips (1958, as cited in Shroff, 2019) through research and by using empirical data for England for the period 1861–1957, presented a correlation between the unemployment rate and change in wage growth.

In later periods, many economists, such as Milton Friedman, questioned Phillips' theory. Then, economists Samuelson and Solow (1960) through their research on macroeconomic data presented the inverse relationship between inflation and the unemployment rate. Despite significant improvements made by Samuelson and Solow, the curve reflecting the inverse relationship between inflation and unemployment is called the Phillips curve (Figure 1).

Figure 1. Phillips curve



Source: Shroff (2019).

## 2.6. Structural adjustment programmes

Structural adjustment policies and structural adjustment programmes (SAPs) refer to programmes

$$FDI_{it} = -146 + 1,497GDP_{it} - 4,171INF_{it} + 486UNEM_{it} \quad (1)$$

for  $i = 1, 2, 3, 4$  and  $t = 2010, 2011, \dots, 2015$

where,  $FDI_{it}$  is foreign direct investment,  $GDP_{it}$  is gross domestic product,  $INF_{it}$  is inflation, and  $UNEM_{it}$  is unemployment in country  $i$  at time  $t$ .

aimed at solving economic disturbances and structural weaknesses such as public debt, inflation, unemployment, the balance of payments deficits, etc. These are high-powered austerity policies and measures, implemented in many countries around the world since the early 1980s, and a condition for receiving international loans from the IMF or other official creditors (Beneria, 1999).

Since their inception, SAPs have been inspired by the neoliberal model, which emphasizes the market as the main allocator of economic resources, and the corresponding reduction in the role of the state in the economy. Although some details may differ from country to country, the main features of SAPs fall into four main policy areas. These specific main areas are the adjustment of the foreign exchange rate, drastic cuts in government spending, the stimulation of deep economic restructuring through market deregulation, including labour and capital markets, but also trade liberalization, and the flexibility of rules that regulate foreign investment (Beneria, 1999).

## 3. RESEARCH METHODOLOGY

In order to further investigate the quantitative relationship between FDI and GDP, different fixed effects models were examined. Fixed effects models are applied with the aim of eliminating estimator bias by considering changes within different time periods (years). This article captures the relationship between FDI on one hand and GDP, unemployment, and inflation on the other.

Table 1 shows the results of the quantitative analysis for the years from 2010 to 2015, for the countries of Greece, Cyprus, Portugal, and Ireland, which have been affected by the financial crisis and in which fiscal consolidation programmes have been implemented. In this study, several combinations of models were investigated and the most prevalent were selected as the most suitable for price interpretation and prediction.

The analysis was based on the following:

$$Y = \beta_0 + \beta_1 \times v + u$$

Two models that were considered most appropriate in relation to the entire course of the research were chosen.

In Model 1, FDI has been considered as a dependent variable and GDP as an independent one. In addition, to ensure the robustness of the estimates, inflation and unemployment have been included in the model as independent macroeconomic control variables. Estimating the sample to be examined in panel format for Ireland, Greece, Cyprus, and Portugal, and for the years 2010 to 2015, the following model is obtained:

In addition, the inverse Model 2 was examined, where GDP is considered as the dependent variable and FDI is included in the independent random variables. The fixed effects Model 2 has the form:

$$GDP_{it} = 115 + 0.0003FDI_{it} + 0,751INF_{it} - 0.632UNEM_{it} \quad (2)$$

for  $i = 1, 2, 3, 4$  and  $t = 2010, 2011, \dots, 2015$ ,

considering the same independent control variables as in Model 1.

Table 1 shows in detail the results of the estimations of Models 1 and 2:

**Table 1.** Fixed effects model estimates

Independent variables	Model 1	Model 2
	FDI	GDP
FDI	- (0.000)	0.0003*** (0.000)
GDP	1,497*** (421.2)	-
INF	-4,171** (1,874)	0.751 (0.854)
UNEM	485.9 (460.6)	-0.632*** (0.137)
Fixed term	-146,359*** (54,031)	114.6*** (5.650)
Number of observations	24	24
Number of countries	4	4
R2	0.5316	0.7448

Note: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . The standard errors of the estimates are shown in parentheses.

Source: Author's calculations.

#### 4. RESULTS AND DISCUSSION

From Table 1, we can see that for Model 1, where FDI is the dependent variable under review, the estimates of the coefficients of the independent variables are statistically significant with the exception of unemployment, which appears marginally insignificant. More specifically, the GDP of each country appears to significantly and positively affect FDI at the 1% significance level. A one-unit change in a country's GDP is estimated to increase FDI by 1.497 units when other explanatory variables remain constant. It is worth noting that the adaptation coefficient of the model is marginally above 53%, which is deemed satisfactory.

Moreover, when GDP is considered as a dependent variable and FDI is included in the set of independent explanatory variables, then the model shows a better fit, with the corresponding adjusted coefficient approaching 75%. The statistical significance of the estimators of Model 2 can be considered satisfactory, with FDI interpreting the development of a country at a significance level of 1%. More specifically, when FDI changes by 1,000 units, then the country's GDP is expected to increase by an average of 0.3 % points.

In addition, such a differentiation can be largely explained by exogenous factors, which are not included in the model but can be captured.

More specifically, it was mentioned that foreign direct investment has various forms, such as acquisitions and mergers, and there are also various categories that push an entity to internationalize.

It is reasonable that each one of the countries under review, as has already been discussed, had requested external financing, but the duration of the adjustment programmes was not the same in all of them, nor were the funds allocated in the same way.

In addition, despite any institutional, economic, and social differences found in the countries under review, there is a common feature, i.e., that all four had entered into adjustment programmes which

they have now exited and begun to regain access to international markets. Also, all four countries are not particularly large in size, nor were they among the strongest economies in the Union, and their macroeconomic figures were among the weakest compared to the strongest economies.

Due to the prolonged recession and high unemployment in some countries, a key priority of economic policy has been the sustainable recovery of the economy. From what was quoted, the conclusion reached is that the measures of the fiscal adjustment programmes caused a deep recession since they did not include measures to stimulate investment and demand.

FDI inflows increase invested capital, productivity, output, employment, and incomes in the host country. Export-oriented foreign direct investment can also promote exports and economic growth.

One of the most important components of investment is the internal situation and environment in which an economy operates. Investment is perhaps the most basic way a country can stay competitive and manage its public finances. In the periods before the financial crisis, global development was going through continuous upward trends. The blow from the effects of the financial crisis was irreparable and could not be foreseen. Equally important were the consequences both in the short term and in the long term, but also at the levels of the internal economy and the external environment.

Through the study of the course and the results of the four countries investigated in the context of this thesis, we found that the results are not the same for all countries that are under the regime of adjustment programmes. International fiscal adjustment programmes do not always have the same purpose and methods. This is also explained by the fact of the parties involved, in each case.

In the case of Ireland and Cyprus, it was found that after the use of the adjustment programmes, these countries managed to improve the conditions in their internal environment, resulting in them becoming attractive destination for investments, which also led to the improvement of their position. At the same time, in the case of Portugal, it was found that although the country was not among the most attractive destinations in terms of investment absorption, after the implementation of the programmes it managed to change the conditions so that investment inflows increased, resulting in the improvement of the economic situation of the country.

In the case of Greece, the financial crisis first started in Greece before it started in the rest of the European Union, bringing about a series of many malfunctions. The recession was getting deeper and deeper, our country's competitiveness was beginning to decline at a very rapid rate, while investor mistrust and insecurity were beginning to increase. Nevertheless, Greece was not able to take advantage of the favourable financing conditions to reduce the ratio of debt to GDP and make it sustainable. Deficits by the end of the decade were quite large, and corrective efforts were absent.

## 5. CONCLUSION

Regarding the results obtained from the statistical analysis, it is worth saying that FDI is greatly influenced by GDP, the level of unemployment, and inflation in the countries that are or have been under the regime of fiscal adjustment programmes. In order to draw safe conclusions in the context of this research, data was drawn from the official website of the EU. The processing of these data led to the conclusion that when FDI is the dependent variable, the estimates of the coefficients of most of the independent variables are decisive, whereas when GDP is the dependent variable there is a fairly good correlation between the independent variables, as the value of the corresponding adjusted coefficient is high. Practically, when one of the independent variables changes, there is a significant correlation with the change of the dependent one.

The indicators of the model were chosen as a result of the literature review and the preceding analysis. The conclusion is that they show an upward trend, which, however, cannot be fully supported, as unweighted factors, which are not included in the models, should always be taken into account. In this direction, we can argue that the independent variables of the model are catalytic as regards the subsequent course of FDI and should be taken into account by decision-makers.

The combinations of the model concerned exclusively the contexts of study and research of the specific article, and the subjective views of the author, combined with the existing literature, provided the basis for developing the model. As discussed above, the independent variables are determining and explanatory factors of FDI and GDP, so they can predict their course with a small degree of deviation. In the context of the present research, it was shown that FDI is very likely to show a downward trend as a result of the deterioration of independent variables (GDP, unemployment, inflation) caused by fiscal adjustment programmes, but subsequently, it is possible, under certain conditions, to start to increase again. There is a margin of flexibility in interpreting the results, as

the countries under review were in fiscal adjustment programmes, so one of the coefficients of the model, unemployment in particular, could be affected, as the governments of the crisis countries could use external financing to create more jobs but also invest in infrastructure to make their economies more attractive for foreign direct investment.

As has already been emphasized, one of the first and most basic objectives of the project was to investigate whether the strategy of foreign direct investment can be a lever for restarting the economy of a country that is in an adjustment programme, i.e., to come out of it more soon and with the least negative effects. Through the course of the investigation, it was shown that FDI they are — mainly for multinational companies — one of their first alternatives, in order to increase the efficiency and effectiveness of their activities. In this direction, it could be said that a multinational that invests in a country involved in an adjustment programme will be able to give it the advantage of changing some of its economic parameters.

The research has some limitations: the period (2010–2015), countries (Greece, Cyprus, Portugal, and Ireland), and the variables (FDI, GDP, inflation, and unemployment).

In conclusion, and based on what was analysed and studied in this paper, and in view of the ultimate purpose of its preparation, it is worth mentioning that future scholars would find it very useful to investigate the ways in which each country that was strengthened by the international fiscal adjustment programmes coped with the new situation and whether, in the long run, the results were positive or not. Another area for research could be the attractiveness of these countries to investors after the completion of their commitments, as the new situation can often involve risks, both for investments and for attracting investment funds from abroad credit institutions.

Finally, through the analysis presented regarding the FDI related to the adjustment programmes, a future researcher could explore the extensive correlation that may exist with other factors.

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