

## The impact of foreign direct investment on economic growth: the Portuguese experience

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**Abstract.** *This study examines the link between economic growth and foreign direct investment for Portugal. Using a panel data approach, the results show that there is convergence among Portugal and her trading partners. Our results also demonstrate that foreign direct investment and bilateral trade promote economic growth. The growth is negatively correlated with inflation and the initial level of GDP per capita. As in previous studies taxes plays a minor role on determining the growth.*

**Keywords:** Portugal; economic growth; foreign direct investment; panel data.

**JEL Codes:** C23, F21, O4.

**REL Codes:** 8E, 10F.

## 1. Introduction

The Portuguese economy is characterized as a small open economy. In terms of geographic location, Portugal is located in Southern Europe, and in the Western part of Iberian Peninsula. The surface of the country, including the archipelago of the Azores (2,247 square kilometers) and Madeira (794 square kilometers), is 92,345 square kilometers.

In recent years, Portugal has diverged from the countries of northern Europe. In fact the regional differences between northern countries and southern Europe seem to be in evidence again.

The issue of convergence versus economic divergence has been a great debate in the literature over the past decades. In 1990s the endogenous growth models emerged. In fact, technological progress, innovation could not be analyzed outside the economic system, as demonstrated by exogenous growth models. The models of monopolistic competition (endogenous) showed that international trade, foreign direct investment and technological factors promoted the economic growth.

The main motivation of this paper is to assess whether Portugal is converging to or diverging from the main trade partner.

The paper presents two important contributions. First, we tested the impact of some explanatory variables such as foreign direct investment and openness trade on Portuguese economic growth. Second we evaluate the convergence versus divergence of Portugal with trade partner.

## 2. Literature review

According to exogenous or neoclassical economic growth theories, capital has an important effect on economic growth. Based on these theories, FDI can increase the growth only in short run, but the economic growth in the long run is influenced by the labor and technology growth. Regarding to some deficiencies in these models especially on the assumption of constant rate of technological progress and diminishing marginal return of capital and after 1980s, endogenous growth theories assume technology as endogenous factor. In this framework, it seems that FDI has higher efficiency than domestic investment. Specifically, these theories with emphasizing on some factors driving growth such as human capital, externalities and spillovers provide some grounds for FDI affecting on the growth (Grossman, Helpman, 1991, Loungani, Razin, 2001). Also, according to endogenous growth theories, FDI absorbed through transferring technology brings out productivity spillovers and consequently increases the growth.

Endogenous growth theories including AK and R&D (Research and Development) models give emphasis on constant rate of return of capital and R&D, respectively. Also based on AK and R&D models, the long run economic growth is explained by capital accumulation and research and development, respectively. Furthermore, in overlapping generational model, the degree of technology spillover is determined by FDI inflows and technology gap conditional on the country's infrastructure level.

Riva-Batiz and Romer (1991) show that countries via getting involved in the world economy have more long run economic growth than the other countries. In the framework of their model, accumulating knowledge and improving technological progress by firms in both domestic and foreign markets promote the growth.

Foreign direct investment is a method to finance domestic investment especially for the countries that don't have enough capital, promotes advanced technology and management and consequently stimulates the growth. Borensztein et al. (1995) have shown that the economic growth increases not only by accumulating capital but also through high efficiency of this form of investment. Also, Rana and Dowling (1988) have pointed out that foreign capital inflows and export are two important determinants that explain economic performance. They believe that FDI facilitates technology transfer and consequently increases capital efficiency and the growth. Also, according to Wang and Blomström (1992) the effect of FDI on the growth depends positively on the substitution of domestic and foreign technologies and educational level in home country.

According to De Mello (1997), FDI accompanies more benefits than other investments since this kind of investment has a positive effect on productivity growth through technology transmission and managerial specialization as well as domestic investment.

Hermes and Lensink (2003) introduce some channels in which FDI has positive effects. First, FDI stimulates competition and consequently the growth. Second, FDI through channel of learning labor force may affect on the growth. Third, technology imitation by domestic firms raises the growth. Forth, FDI via upgrading managerial and technological processes increases the economic growth. In general, the spillover of FDI on domestic labor efficiency increase in competition, upgrading the products' qualities and development of markets are other factors that are important in affecting FDI on the growth.

Blomström et al. (2001) emphasize that FDI may raise the growth of host country provided that this country has an acceptable education system.

In sum, there is no universal agreement about the positive association between FDI inflow and economic growth. Specifically, research that focuses

on data from only less developed countries has tended to find a clear positive relationship while studies that have focused on data from only developed countries have found no growth benefit for the recipient country (Gürsoy, Kalyoncu, 2012).

The other major determinant factor of the growth is trade openness. This factor has been used extensively in the literature. Openness affects on the growth through several channels such as exploitation of comparative advantage, technology transfer and diffusion of knowledge, increasing economies of scale and exposure to competition. Also, a large part of the literature has found that economies with higher trade openness have higher economic growth (Petraikos et al., 2007).

Inflation as the other determinant factor leads to uncertainty about the future investment projects and consequently decreases the level of investment and the growth. Also, inflation may reduce the international competitiveness of the country by making its exports relatively expensive. Furthermore, low inflation as a stability index reduces systematic risk and promotes investment, trade and economic growth. High rates of inflation create macroeconomic instability which reduce economic efficiency and then limit the growth.

The other determinant factor is the initial GDP per capita. This relationship is related to income convergence hypothesis. This hypothesis implies that on average countries with relatively low levels of GDP per capita have been growing faster than countries with relatively high levels.

Finally, it seems that tax has a negative impact on the growth. This factor by reducing the stimulus of economic activities may limit the growth. Also, the higher tax can discourage the investment rate, labor force rate, productivity and consequently reduce the growth. Of course, in endogenous growth model, there is scope for well designed government expenditure and tax systems to play an important role in determining long run economic growth, through its effect on the rate of investment of human and physical capital. By well designed systems, the literature implies an emphasis on non distortionary forms of taxation and on productive expenditures (Coutinho, 2012).

### 3. Methodology approach and model

Starting from the growth literature, we determine which economic variables should be included in the model and in what form. Before presenting the results of our estimations, we discuss the dependent and explanatory variables, describe the data model and address the hypothesis.

This study uses a panel data. In the static panel, we estimated by means of pooled OLS, fixed effects (FE) and random effects (RE). The F statistics test

the null hypothesis of the same specific effects for all individuals. If we accept the null hypothesis, we can use the OLS estimator. The Hausman test can show us which model is better: random effects (RE) or fixed effects (FE).

### 3.1. Econometric model: explanatory variables and data description

The dependent variable is the real GDP per capita of Portugal<sup>(1)</sup> for the period 1995 and 2008. The data are taken from World Development Indicators and the World Bank. First of all the descriptive statistics for panel data is presented in the following table.

Table 1 presents summary statistics for each variable. LogTRADE, LogINF and LogTAXES appear to have only little differences for means and standard deviations. However, this is not the case for the LogGrowth, LogGDP and LogFDI.

Table 1

**The impact of FDI on economic growth: Summary statistics**

Variables	Mean	Std. Dev.	Min	Max
LogGrowth	-0.01	0.17	-2.32	0.02
LogGDP	2.24	0.06	2.12	2.32
LogFDI	3.84	1.00	-0.22	5.96
LogTRADE	1.70	0.27	1.12	1.87
LogINF	1.02	0.21	0.65	1.48
LogTAXES	2.87	2.87	2.63	3.36

Following the literature review, we consider that economic growth in Portugal is a function of income, foreign direct investment, trade openness, inflation and Portuguese taxes.

$$Growth = f(GDP, FDI, TRADE, INF, TAXES) \quad (1)$$

Where

*Growth* is the real GDP per capita; *GDP* is the initial level of GDP per capita; *FDI* is inward foreign direct investment; *TRADE* is bilateral trade; *INF* is inflation, and taxes.

A series of hypothesis were formulated, considering how the selected variables will influence the growth in Portugal.

*Hypothesis 1: There is a negative correlation between initial level of GDP per capita and economic growth.*

The income measure selected in this paper is the Gross Domestic Product per capita of origin countries, which is expressed in constant 2,000 US\$ and is collected from World Bank.

According to the assumptions of growth models, the hypothesis 1 reflects economic convergence. Barro (1991) and Dreher (2006) showed that economic growth has been negatively correlated by initial level of GDP per capita.

*Hypothesis 2: There is a positive (dominant paradigm) correlation between FDI and growth.*

FDI - is Portuguese inward foreign direct investment. The data are collected from UNCTAD, FDI database. The studies of Kai and Hamori (2009), Damijan and Rojec (2007), Campos and Kinoshita (2002), Badinger and Tondl (2002), Mileva (2008), and Onaran (2007) show that foreign direct investment influences the economic growth.

However De Mello (1999) and Ayanwale (2007) support a negative impact of FDI on growth.

*Hypothesis 3: International trade flows is an important vehicle in economic growth.*

In this research, volume of trade is hypothesized to promote economic growth (Grossman, Helpman, 1991, Rebelo 1991). Trade openness was estimated as:

$$TRADE_{i,t} = \frac{X_{i,t} + M_{i,t}}{GDP_{Portuguese,t} + GDP_{K,t}} \quad (2)$$

Where

$X_{i,t}$  represents the annual exports of Portugal to the trade partner at time t and  $M_{i,t}$ , represents the annual imports of Portugal from trade partner at time t.  $GDP_{K,t}$  is the GDP per capita from each trade partner (constant 2,000 US\$) at time t. The data for trade are collected from Portuguese National Institute of Statistics. We expect a positive sign for this proxy.

*Hypothesis 4: The growth is negatively correlated with inflation.*

INF- that is Portuguese inflation, i.e, measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as a year. The studies of Gillman and Kejak (2005),

and Fountas et al. (2006) found the negative effect on growth. The data are collected by World Bank.

*Hypothesis 5: The higher level of taxes discourages the growth.*

TAXES- which is Portuguese taxes, total tax rate measures the amount of taxes and mandatory contributions payable by businesses after accounting for allowable deductions and exemptions as a share of commercial profits. Taxes withheld (such as personal income tax) or collected and remitted to tax authorities (such as value added taxes, sales taxes or goods and service taxes) are excluded. The data are collected by World Bank. The studies of Padovano and Galli (2002), Koch et al. (2005) show that the reduction in growth is explained by the distortion tax.

Therefore, the econometric model on estimation economic growth takes the following representation:

$$Growth_{it} = \beta_0 + \beta_1 \times X_{it} + \delta t + \eta_i + \varepsilon_{it} \quad (3)$$

Where

$Growth_{it}$  is Portuguese real GDP per capita, and X is a set of explanatory variables. All variables are in the logarithm form;  $\eta_i$  is the unobserved time-invariant specific effects;  $\delta t$  captures a common deterministic trend;  $\varepsilon_{it}$  is a random disturbance assumed to be normal, and identically distributed with  $E(\varepsilon_{it})=0$ ;  $Var(\varepsilon_{it})=\sigma^2 > 0$ .

Two types of models were developed to estimation the economic growth for Portugal, namely a fixed effects versus random effects and logistic regression.

### 3.2. Results and Discussions

The results of fixed effects and random effects are report in Table 2. With fixed effects the explanatory power of the Portuguese economic growth regression is very high (R-squared=0.78).

According to the results displayed in fixed effects all explanatory variables are statistically significant at 1% ( $LogGDP$ ,  $LogTRADE$ ,  $LogINF$ , and  $LogTAXES$ ) and 10% level ( $LogFDI$ ).

Table 2

**The impact of FDI on economic growth: Fixed and Random Effects**

Dependent variable : economic growth (LogGrowth)			
Independent variables	Fixed effects	Random effects	Expected signs
LogGDP	-0.15 (-17.42)***	-0.14 (-24.72)***	(-)
LogFDI	0.009 (1.91)*	0.002 (1.21)	(+; -)
LogTRADE	0.17 (16.91)***	0.16 (30.86)***	(+)
LogINF	-0.01 (-3.19)***	-0.02 (-5.80)***	(-)
LogTAXES	-0.04 (-4.06)***	-0.03 (-4.72)***	(-)
C	0.06 (1.84)*	0.06 (3.04)***	
N	220	220	
Adj. R <sup>2</sup>	0.78	0.77	
Hausman test of H0: RE VS FE Asymptotic test statistics Chi-square (5)= 1.16 P-value= 0.95 F(5,17) = 2035.17 P-value=0.00			

T-statistics (heteroskedasticity corrected) are in round brackets.

**Note:** \*\*\*/\*\*/\* – statistically significant, respectively at the 1%, 5%, and 10% levels.

The initial per capita GDP (*LogGDP*) presents statistical significance with a negative sign. Our results confirm the empirical studies of as in Barro (1991), Kai and Homori (2009), Dreher (2006) and Dreher and Gaston (2008).

The variable *LogFDI* (foreign direct investment) is statistically significant with a correct sign. This result shows that foreign direct investment promotes growth. The studies of Li and Liu (2005), and Mullen and Williams (2005) found this result.

The trade variable coefficient (*LogTRADE*) has a positive sign, as we expected, and corresponds to the results of Grossman and Helpman (1991) and Rebelo (1991). An increase of 1% of bilateral trade would generate an increase of 0.17% of economic growth to Portugal.

We expect that inflation (*LogINF*) would have a negative impact on economic growth. Our result is according to previous studies (Gillman, Kejak, 2005, Fountas et al., 2006). The result indicates that inflation affects the economic growth perspectives.

The variable taxes (*LogTAXES*) finds a negative sign, as we expected, and corresponds to the results of Padovano and Galli (2002), and Koch et al. (2005). So we can infer that the reduction of growth is caused by the distortion taxes.

The Table 3 presents the estimation using Logistic regression. The general performance of model is satisfactory. The explanatory variables (*LogGDP*, *LogTRADE* and *LogINF*) are significant at 1% level.



Table 3

**The impact of FDI on economic growth: Logistic regression**

Dependent variable : economic growth (LogGrowth)		
Independent variables	Fixed effects	Expected signs
LogGDP	-8.09 (-4.98)***	(-)
LogFDI	-0.18 (-0.73)	(+; -)
LogTRADE	11.13 (7.75)***	(+)
LogINF	-2.87(-4.95)***	(-)
LogTAXES	0.18 (0.11)	(-)
N	220	
Log pseudolikelihood	-111.8	
Wald chi2(5)	374	
Prob > chi2	0.00	
Pseudo R2	0.39	

**Note:** \*\*\*/\*\*/\* – statistically significant, respectively at the 1%, 5%, and 10% levels.

The initial GDP per capita (*LogGDP*) with negative sign confirms the empirical studies as in Barro (1991), Kai and Homori (2009), Dreher (2006), Dreher and Gaston (2008).

The coefficient of foreign direct investment (*LogFDI*) is not significant. This result is in line of Carkovic and Levine (2005), and Alfaro et al. (2007). These authors argue that the relationship between FDI and growth depends on economic climate.

The variable *LogTRADE* (openness trade) is statistically significant with a correct sign. This result demonstrates that bilateral trade promotes economic growth. The studies of Grossman and Helpman (1991) and Rebelo (1991) also found the same result. One of the main determinants of economic growth is the positive impact in the Portuguese economy.

The coefficient of inflation (*LogINF*) finds a negative sign. Gillman and Kejak (2005) found a negative impact for Hungary and Poland.

The results show that there are relationships between economic growth and foreign direct investment, and trade. The relationships between initial GDP per capita and inflation are according to previous studies.

#### 4. Conclusions

In this paper we have examined the effect of foreign direct investment on economic growth for Portugal. The empirical analysis with fixed effects estimator shows that FDI influences on the economic growth. It seems that FDI through stimulating competition, learning labor force, upgrading managerial and technological processes, developing of markets has a positive effect on the growth.

The initial GDP per capita used to evaluate the convergence economic shows that the result is according to exogenous economic models.

Our results also demonstrate that the openness trade is according to the dominant paradigm, i.e, there is a positive relationship between openness trade and growth.

Based on the literature, tax affects on economic growth negatively, i.e. a higher level of taxes discourage the economic growth. Our findings support this hypothesis.

The control variable used to analyze the macroeconomics stability (inflation) found the expected sign. This result is also found by Gillman and Kejak (2005), and Fountas et al. (2006).

The study has however some limitations. In the future, we need to include other control variables as in exchange rate, credit bank indicators, and budget deficit.

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## Note

- <sup>(1)</sup> The countries selected are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherland, Spain, United Kingdom, United States, Sweden Brazil, Canada, and Japan.

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## Appendix



**Figure A1.** Panel line plot: inward foreign direct investment by Portugal