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EXPLORING FACTORS THAT INFLUENCE ON GDP GROWTH RATE OF EUROPEAN UNION COUNTRIES

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ABSTRACT

The main purpose of this study is to investigate the impact of seven variables (FDI, remittances, gross savings, inflation, unemployment, business entry density and times required to start a business) on GDP growth of 28 countries member of European Union by using annual data over the two year period 2011-2012. From the regression analyses, the coefficients of FDI, gross savings, inflation, business entry density and times required to start a business resulted positive and statistically significant in determine the GDP growth rate of the EU countries. The results of the study also demonstrate that the increase of remittances and the reduction of unemployment rate have not direct impact on GDP growth rate during the period of the study.

Keywords: FDI, Remittances, Inflation, GDP growth of EU members.

INTRODUCTION

Albania along with other Western Balkans countries was identified as a potential candidate for EU membership during the Thessaloniki European Council summit in June 2003. In 2009, Albania submitted its formal application for EU membership. In its Opinion on Albania's application (in 2010), the Commission assessed that before accession negotiations could be formally opened, Albania still had to achieve a necessary degree of compliance with the membership criteria (European Commission, 2015). The European Union actually has 28 countries from the year 2013; Austria, Belgium, Bulgaria (from 2007), Croatia (from 2013), Czech Republic (from 2004), Cyprus (from 2004), Denmark, Estonia (from 2004), Finland, France, Germany, Greece, Hungary (from 2004), Ireland, Italy, Latvia (from 2004), Lithuania (from 2004), Luxembourg, Malta (from 2004), Netherlands, Poland (from 2004), Portugal, Romania (from 2007), Slovak Republic (from 2004), Slovenia (from 2004), Spain, Sweden, United Kingdom (OECD, FDI in Figures, 2014).

The economic crisis of Europe since 2008 has raised concerns about the health of the European countries. Despite of many years of research about the factors that effects the economic growth of these countries, still a solution is not found because the problematic of each country are not yet fully understood. We should mention that trade has been hit by the global recession, but the EU remains the world's largest player accounting for 16.4% of global imports in 2011. The EU was also the biggest exporter accounting for 15.4% of all exports-compared with 13.4% for China and around two-thirds of EU countries' total trade is done with other EU countries (European Commission, 2015). In the first quarter of 2013, the number of jobs was at its lowest levels in the EU since the onset of the crisis and the number of unemployed people hit a historic high of 26.6 million (or 11% of the active population) in April 2013 (Crisis Monitoring Report, 2014, p.13).

The depreciation of the euro's nominal effective exchange rate should strengthen the competitiveness of EU and euro area exporters. But, net exports are expected to contribute little to GDP growth over the forecast horizon, as domestic demand growth should lead to an offsetting rise in imports. Bank lending to the private sector remains weak in the euro area, but it is gradually improving (European Commission, European Economic Forecast, 2015).

*Background of the study***:** The economic growth of the countries of European Union is not satisfactory especially after the financial crises. Various factors are liable for this insufficient GDP growth rate: the rate of exports, inflation rate, increasing of unemployment rate in same countries, the reduction of FDI etc. In Greece the unemployment rate for 2011 was 17.17 percent and in 2012 was 24 percent and in Spain the unemployment rate for 2011 was 21.6 percent and in 2012 was 25 percent. Also Greece had the lowest GDP growth rate in 2012 (minus 6.4 percent) followed by Portugal (minus 3.2 percent) (World Development Indicators, 2013 and 2014).

Objectives of the study: The main objective of the study is to investigate the impact of macroeconomics variables on GDP growth of European Union countries during the period 2011-2012. To achieve the objective, correlation coefficient and regression analysis are used.
The rest of this paper is organized as follows: the next section is literature review on the issue discussed; the third section describes the data, variable definition and regression model; the fourth section is hypothesis development of this study; the fifth section summarizes descriptive statistics and regression results. The last section presents the conclusion of the study.

LITERATURE REVIEW

GDP is one of the most comprehensive and closely watched economic statistics (BEA, 2014). It is one of the measures of national income and output for a given country's economy at a given period of time. The definition of GDP is based on the total market value of all final goods and services produced within the country in a given period of time an normally one year (Kira, 2013).

The Gross domestic product (GDP) of any country is affected by different macroeconomic variables. Some general macroeconomic variables are inflation, foreign direct investments, remittances, exchange rate, unemployment rate, interest rate etc. Different studies have found different conclusions. Tolo (2011) used a panel of 23 emerging markets over the period 1965-2008 to study the determinants of per capita GDP growth in the Philippines. Panel regressions suggests that factors such deficit, inflation, trade openness, the current account balance and the frequency of crisis episodes are significant determinants of economic growth.

Mehmood (2012) study investigates the affect of thirteen selected factors (independent variables) on Gross Domestic Product (GDP) in Pakistan and Bangladesh. GDP is used as the dependent variable and the independent variables used are: gross national expenditure, final consumption expenditure, goods exports & imports, services exports and imports, external debt stocks, gross saving, FDI inflows, FDI outflows, gross domestic income, net income from abroad and worker's remittances and compensation of employees paid. The study found that in Pakistan gross national expenditures, goods exports, gross saving and final consumption expenditure have

a positive effect on the GDP. Also, the study suggests that gross national expenditures, external debts stock total, goods imports and exports have positive effect on the GDP of Bangladesh. Agalega and Antwi (2013) study was focused on the effects that changes in the inflation and interest rates have on the GDP in Ghana over a period of thirty one years from 1980 to 2010. The paper employed multiple linear regressions and found that inflation and interest rate could explain only 44 percent of the movement of GDP. They found a positive relationship between inflation and GDP and a negative one between interest rate and GDP. Antwi et al. (2013) study suggests that real GDP per capita is a function of physical capital, labor force, foreign direct investment, foreign aid, inflation and government expenditure. Their research proved that long-run economic growth in Ghana is explained by physical capital, foreign direct investment, foreign aid, inflation and government expenditure and that is not affected by short-terms changes in labor force.

Kbria et al. (2014) study in Pakistan investigates the impact of macroeconomic variables (interest rate, exchange rate, inflation and FDI) on GDP growth by using annual data during the period 1980-2013. From the regression analysis they suggest that inflation, interest rate, exchange rate and FDI have significant impact on GDP growth of their country. Literature Review should be given in this section. All the subheadings in this section should be in font size 12 Bold, Times New Roman, single spaced. The first letter of each word in subheading should be capital.

METHODOLOGY

In this section, we describe our sample, variables and the model used in determining the impact of the independent variables on firm's capital structure. The sample used is of 28 countries (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia Republic, Slovenia, Spain, Sweden, United Kingdom) covering the period 2011-2012. All the data are collected from World Development Indicators, annual reports for 2013 and 2014, published from the World Bank.

The independent variables used in the analysis are:
FDI= Foreign direct investment of the country
REM= Remittances of the country
G.SAVE= Gross saves of the country as percentage of GDP
CPI= Consumer price index of the country
UNEM=Unemployment rate of the country
B.ENTRY= Business entry density per 1000 people of ages 15-64
TIME= Times required to start a business
And the dependent variable is:
GDP= GDP growth rate of the country

We use a simple multiple regression analysis to test *YGdp* as the dependent variable against the above mentioned independent variables. The model used in our study is as follows:

$$YGdp=\alpha0+\alpha1*FDI+\alpha2*Rem+\alpha3*G.Save+\alpha4*CPI+\alpha5*Unem+\alpha6*B.Entry+\alpha7*Time+\varepsilon$$

Where *YGdp* indicates countries' growth rate and ε is the error term. Using data as described earlier we will estimate all coefficients (alphas) of the equation.

Hypotheses

In order to identify the effect of the selected determinants on the firm's capital structure decision and the effect of industry the study used seven hypotheses which are presented below:
H 1: FDI is positively related to GDP growth rate of the EU countries.
H 2: Remittances are positively related to GDP growth rate of the EU countries.
H 3: Gross savings are positively related to GDP growth rate of the EU countries.
H 4: Inflation rate is negatively related to GDP growth rate of the EU countries.
H 5: Unemployment rate is negatively related to GDP growth rate of the EU countries.
H 6: Business entry density is positively related to GDP growth rate of the EU countries.
H 7: Times required to start a business is positively related to GDP growth rate of the EU countries.

Decriptive Statistics

The following table shows the correlation coefficients between independent variables and GDP growth rate for the entire sample. This analysis is carried out to identify whether the relationship between the variables is positive or negative. The linear correlation coefficient (r), measures the strength and direction of a linear relationship between the variables. If "r" is greater than 0.8, it indicates a strong relationship between the variables. If "r" is less than 0.5, it indicates a weak relationship between the variables.

Table 1: Correlation coefficients, using the observations 1:1 - 28:2, 5% critical value (two-tailed) = 0.2632 for n = 56

GDP	FDI	REM	G.SAVE	CPI	UNEM	B.ENTRY	TIME	
1.000	-0.011	-0.050	0.5060	0.3271	-0.289	0.0702	0.1796	GDP
	1.0000	0.0879	-0.053	-0.106	-0.072	-0.094	-0.078	FDI
		1.0000	0.0382	-0.093	-0.062	-0.194	-0.152	REM
			1.0000	0.1126	-0.313	-0.287	-0.159	G.SAVE
				1.0000	0.0333	0.0527	-0.002	CPI
					1.0000	-0.127	0.0419	UNEM

Table 1 shows the correlation between the explanatory variables specifically with respect to GDP. As we can notice GDP is positively correlated with G.SAVE (50.60 percent), CPI (32.71 percent), B.ENTRY (7.02 percent) and TIME (17.96 percent). Also it is demonstrated that GDP is negatively correlated with FDI (1.1 percent), REM (5 percent) and UNEM (28.9 percent).

Table 2: Summary statistics, using the observations 1:1 - 28:2

Variable	Mean	Median	Minimum	Maximum	Std. Dev.	C.V.
GDP	0.9196	0.8000	-7.1000	8.3000	2.7754	3.0179
FDI	1.27991 e+010	4.23800 e+009	-1.91700 e+009	1.02000 e+011	1.84291 e+010	1.4399

REM	5.16989 e+009	1.64900 e+009	3.30000 e+007	1.01230 e+011	1.38894 e+010	2.6866
G.SAVE	19.2536	20.1000	5.4000	26.2000	5.2508	0.2727
CPI	3.0518	2.9000	0.9000	5.8000	0.9643	0.3160
UNEM	10.3821	9.1500	4.0000	25.0000	4.7268	0.4553
B.ENTRY	5.56911	4.2400	0.5000	24.7300	5.1767	0.9295
TIME	14.0357	12.5000	4.0000	40.0000	8.9584	0.6383

Table 2 reports summary statistics for the variables used in our study. They are explained in a more detailed way below:

Economic growth is measured by the change in the volume of output or by the change in the real incomes of country residents. This study uses GDP growth rate, which is measured through the average annual percentage growth of the volume of gross domestic product. Forecasts of economy growth rates come from World Bank (2013 and 2014). Economic growth is used as the dependent variable in order to determine the factors that influence on it are. Table 2 shows that the average of GDP growth rate for the sample as a whole is approximately 0.9196 percent.

Foreign direct investments (FDI) is measured through net inflows of the EU countries. Despite signs of recovery in 2011, FDI inflows as a percentage of GDP fell 15 percent in 2012, showing that the region had not fully recovered from the financial crisis (World Bank, 2014). The mean value of FDI is 12.799,1 million $ for the sample with a minimum value equal to minus 1.917 million $ (Belgium in 2012) and a maximum value equal to 102.000 million $ (Belgium in 2011).

Remittances (REM) measures the inflows of personal remittances of the EU countries. Personal remittances received as a percentage of GDP continued a slow but steady path of growth, up 1.5 percent in 2012 (World Bank, 2014). The mean value of REM in the EU countries was 5.169,89 million $. The country which has received less personal transfers is Malta with 33 million $ in 2012 and the country which has received more personal transfers is Belgium with 101.230 million $ in 2012.

Gross savings (G.SAVE) is calculated as percentage of gross saving to GDP of the country. The mean value of this indicator is 19.2536 percent. Greece has the lowest value of gross savings equal to 5.4 percent of GDP in 2011 and Sweden has the highest value of gross savings equal to 26.2 percent in 2011 and 26.4 percent in 2012.

Consumer price index (CPI) is a measure of inflation and considers changes in the price level of a basket of goods and services purchased by the consumers of one country. The mean value of CPI in EU countries was 3.0518 percent. Sweden has the lowest value of CPI equal to 0.9 percent in 2012 and Hungary has the highest value of CPI equal to 5.7 percent in 2012.
Unemployment (UNEM) rate is the percentage of the unemployed persons considered economically active but who are without work, including people who have lost their jobs or who have voluntarily left work and that are seeking work. Some unemployment is unavoidable

because it is caused by the operations of labor markets. It is not very easy to measure the unemployment rate of one country and some of the reasons are: economic sectors are sectionals like agriculture; people change frequently their jobs in order to find a better one; women often work part-time and are registered as unemployed; woman leave their jobs in order to take care of their children etc. But sometimes changes in unemployment rate may also reflect changes in reporting practices (World Bank, 2014). Also it depend on the development and welfare of one country and how long people can effort being unemployed until they find the appropriate job. The mean value of unemployment in EU countries was 10.3821 percent. Austria has the lowest value of UNEM equal to 4 percent in 2012 and Spain has the highest value of UNEM equal to 25 percent in 2012.

Business entry density (B.ENTRY) is measured with the rate of the new businesses added to an economy. Data on business entry density are from the World Bank's 2013, 2014 Entrepreneurship Database (World Bank, 2013 and 2014). This indicator is measured per 1000 people of ages 15-65. Austria has the lowest value of business entry equal to 0.56 in 2011 and 0.5 in 2012. At the other side Cyprus has the highest value equal to 24.73 in 2011 and 22.51 in 2012.

TIME required to start a business are derived from the Doing Business database (World Bank, 2013 and 2014). The report of the World Bank identifies same limitations of this indicator: 1-the data refer to businesses in the economy's largest city; 2-the data often focus on a specific business form, generally a limited liability company of a specified size; 3-transactions described in a standardized business case refer to a specific set of issues and may not represent all the issues a business encounters; 4-the time measures involve an element of judgment by the expert respondents; 5-the methodology assumes that a business has full information on what is required. The average number of days to start a business in EU is approximately 14 days. The minimum number of days to start a business in EU is 4 days (Austria and Netherlands in 2012) and the maximum is 40 days (Malta).

Multicollinearity Analysis of the Variables

It is possible that the selected variables may be correlated, so the chosen variables may actually measure the effects of several different variables. To address this problem the study tests for the multicollinearity. The Variance Inflation Factor (VIF) is commonly used to test the multicollinearity problems. It shows the degree to which each independent variable is explained by other independent variable. As a rule of thumb, a VIF greater than 10 indicates the presence of a harmful collinearity (Gujarati, 2004).

Table 3: Multicollinearity analysis of the variables selected

Variable	VIF
FDI	1.050
REM	1.085
G.SAVE	1.354
CPI	1.042
UNEM	1.215
B.ENTRY	1.247
TIME	1.064

Table 3 shows the Variance Inflation Factor (VIF) of all the variables of this study. The results show that VIF for all the variables are less than 10 and the problem of multicollinearity is not present into the regression model.

RESULTS

Employing panel data (cross pooled sectional data) analysis (Gujarati, 2004) and using Gretl (2012) statistical package we obtain the following results:

Table 4: Regression results

	Coefficient	Std. Error	t-ratio	p-value	
CONST	-9.42464	1.38931	-6.7837	<0.00001	***
FDI	1.60666e-011	9.14217e-012	1.7574	0.08522	*
REM	1.15311e-011	1.86985e-011	0.6167	0.54036	
G.SAVE	0.336437	0.042416	7.9318	<0.00001	***
CPI	0.669918	0.226926	2.9521	0.00487	***
UNEM	-0.046251	0.050277	-0.9199	0.36221	
B.ENTRY	0.126403	0.038912	3.2484	0.00212	***
TIME	0.099695	0.019292	5.1677	<0.00001	***

Table 4, presents the regression results of Gross Domestic Product growth rate of the selected countries between 2011 and 2012.

Table 5: Statistics based on the weighted data

Statistics	Value
R-squared	0.7132
Adjusted R-squared	0.67136
F (7, 48)	17.0512
P-value (F)	4.34e-11

Table 5, shows same of the statics of the regression model. The coefficient of determination-R^2 is a measure of the proportion of the variance of the dependent variables that is explained by the independents or predictor variables. R-square equal to 0.7132 indicates that about 71.32 percent of the variability of GDP growth rate is explained by the chosen variables. The remaining 28.68 (100 percent minus 71.32 percent) variance in the GDP growth rate is attributed to other variables. The F-statistic of 17.0512 and P-value (F) less than 0.005 suggests that the model fits the data significantly.

Regression coefficients represent the mean change in the response variable for one unit of change in the predictor variable while holding other predictors in the model constant. The regressions coefficients of the variables FDI, G.SAVE, CPI, B.ENTRY and TIME appear significant in determine GDP growth rate of the European Union countries.

CONCLUSIONS

Multiple regression analysis is applied to identify which factors influence on the GDP growth rate of the European Union countries. Some key determinants of GDP growth are investigated in

a panel of 28 states over the period 2011-2012. The independent factors which are taken in consideration are: FDI inflows, remittances received, and the percentage of gross savings to GDP, CPI, unemployment rate, business entry and time needed to start a business. The study suggests that each factor except the unemployment rate influence positively on the economic growth of EU countries. Also all the coefficients of the selected variables resulted statistically significant except the coefficients of remittances and of unemployment rate.

So the relation between GDP of the EU countries and FDI, gross save, CPI, business entry and number of days to start a business is positive and statistically significant. Remittances and unemployment rate are not significant determinants of GDP growth rate of the EU countries. The sight of the coefficients of these variables is as predicted but they have a weak relation with the economic growth of the sample. According to the regression results hypotheses H1, H3, H4 H6 and H7 are accepted and the hypotheses H2 and H5 are rejected. Some of the limitations of this study are:

- The period of the study is limited into only two years.
- It would be interesting to include a dummy variable for the countries which aspire to become members of EU countries in order to verify if the independent variables influence in the same way on their economic growth. On the road to EU membership candidate countries are Albania, Iceland, Montenegro, Serbia, The Former Yugoslav Republic of Macedonia and Turkey.
- Further research should examine other factors which may influence on economic growth.
- This study has used as a sample 28 countries. Because the problematic of each country are not the same, it would bring other results if we divide the 28 countries into groups according to their economical development or period of becoming membership of EU for example before the year 2000 (15 countries) and after the year 2000 (13 countries).

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