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The impact of Global Financial Crisis of 2007-2008 on productivity and growth in the group of "Austerity" EU countries, with an emphasis on the role of Institutions

ΡΙΣΙΑΝΟΥ ΜΑΡΙΑ-ΑΓΓΕΛΙΚΗ

Διπλωματική εργασία υποβληθείσα προς μερική εκπλήρωση

των απαραιτήτων προϋποθέσεων

για την απόκτηση του

Μεταπτυχιακού Διπλώματος Ειδίκευσης

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ABSTRACT

The present thesis aims to examine how and to what extent the Global Financial Crisis of 2007-2008 affected the productivity and growth of European countries under "Memorandum" Policy, as well as the impact of the quality of institutions in these countries. We firstly analyze the concept of productivity and the factors that determine it, referring to the role of the Institutions in productivity and the role of the Global Financial Crisis in the Economy of European countries. The concept of Institutions is then analyzed in more detail by a review of institutional theories, while a review of theories related to the economic development and growth of countries is also presented. In addition, the factors determining and suppressing economic development and growth are mentioned respectively. Finally, in this thesis, a VAR analysis of time series is performed to investigate the existence or not of Granger causality among GDP per hour worked (productivity) and Worldwide Governance Indicators (Institutions). The data were extracted from the OECD and World Bank databases respectively over the period 2002 - 2018.

Keywords: Financial crisis, Institutions, productivity, economic growth, VAR, Granger causality

ΠΕΡΙΛΗΨΗ

Η παρούσα διπλωματική εργασία στοχεύει στην εξέταση του πώς και σε τί βαθμό η Παγκόσμια Χρηματοοικονομική Κρίση του 2007 – 2008 επηρέασε την παραγωγικότητα και τη μεγέθυνση των Ευρωπαϊκών χωρών που ακολούθησαν «Μνημονιακή» Πολιτική, καθώς και το ρόλο που έχει παίξει η ποιότητα των θεσμών στις χώρες αυτές. Αρχικά αναλύονται η έννοια της παραγωγικότητας και των παραγόντων που την προσδιορίζουν, αναφέροντας τον ρόλο των Θεσμών στην παραγωγικότητα αλλά και το ρόλο της Παγκόσμιας Χρηματοοικονομικής Κρίσης στην Οικονομία των Ευρωπαϊκών χωρών. Στη συνέχεια, αναλύεται διεξοδικότερα η έννοια των Θεσμών κάνοντας μια ανασκόπηση στις Θεσμικές Θεωρίες , ενώ παράλληλα γίνεται μια ανασκόπηση στις θεωρίες που σχετίζονται με την οικονομική ανάπτυξη και τη μεγέθυνση των χωρών. Αναφέρονται επιπλέον και οι προσδιοριστικοί παράγοντες που ωθούν και καταστέλλουν αντίστοιχα την οικονομική ανάπτυξη και μεγέθυνση. Τέλος, στην παρούσα διπλωματική εργασία γίνεται ανάλυση Αυτοπαλίνδρομων (VAR) χρονολογικών σειρών για την εξέταση της αιτιότητας κατά Granger μεταξύ του ΑΕΠ ανά ώρα εργασίας (παραγωγικότητα) και των Παγκόσμιων Δεικτών Διακυβέρνησης (Θεσμοί). Τα δεδομένα αντλήθηκαν από τις βάσεις δεδομένων του ΟΟΣΑ και της Παγκόσμιας Τράπεζας αντίστοιχα, για την περίοδο 2002 – 2018.

Λέξεις κλειδιά: Οικονομική κρίση, Θεσμοί, παραγωγικότητα, μεγέθυνση, VAR, Granger causality

Chapter 1: INTRODUCTION

The purpose of this thesis is to show the impact and the consequences of the Global Economic Crisis of 2007-2008 on productivity and growth in European countries. It will also examine the role that the quality of Institutions plays in the process of productivity, since this issue is of particular economic importance.

The financial crisis of 2007 – 2008 affected mainly the banking system and therefore the general economy, especially the countries of southern Europe, which were forced to follow a "Memorandum" policy in accordance with the recommendations of the European Central Bank (ECB) and the International Monetary Fund (IMF), because of the negative effects this crisis has had on their economies. Examples of countries that have pursued "Memorandum" policy programs in order to cope with this difficult economic crisis are: Cyprus, Greece, Ireland, Italy, Portugal and Spain. In general, almost all European countries were affected by the effects of this crisis, some to a lesser extent and others to a greater extent, depending on how robust their economy was at that time.

A part of the thesis deals with the examination of Institutions. Initially, an overview of what Institutional Theory is, what theories are related to economic development and growth, and what are the factors that promote and suppress economic development and growth respectively. The purpose of this thesis is also to show how Institutions influence a country' s development and growth. An econometric analysis will follow and the results of this analysis will be compared with the results of other corresponding empirical studies. The period selected for our data analysis is from 2002 to 2018.

The above topics will be presented in the following chapters at various levels of analysis. More specifically, the Chapter 2 of this thesis is an introduction to the concept of productivity and the factors on which it depends. So in this chapter will be presented studies from the international literature describing the determinants of productivity as well as the role of Institutions. In particular, at the level of analysis we divide Europe into countries with high productivity and countries with low productivity. This analysis will be done in conjunction with the situation of economies before and after the Global Economic Crisis of 2007-2008 so that we can examine in the next chapters how much the productivity and growth were affected by this crisis.

In the third chapter, the analysis focuses on the productivity and growth of the European countries that followed the "Memorandum" Policy, as well as the role played by the quality of institutions in these countries. In Chapter 3, we will analyze how the transmission of the global economic crisis in Europe had as a result six European countries in the Eurozone to join in austerity programs ("Memorandums") so that their economy and as well as the economy of other European countries will not collapse, as the economy of the European Union (EU) operates as a single market but consists of 28 member states. Therefore, it is quite natural that there is interdependence in the economies of the EU countries. So to

see the first signs of the crisis we will compare in the next Chapter the GDP of the countries that followed the "Memorandum" policy with the GDP of the Eurozone countries, the EU, the OECD, of Latin America & Caribbean and East Asia & Pacific in total and we will list their descriptive statistics. The data have been extracted from the World Bank's database from 1970 to 2018.

In Chapter 4 we will analyze our data and list their descriptive statistics. To be more specific, we will analyze the GDP per capita and GDP per hour worked. GDP per hour worked has been extracted from the OECD database over the period 1970 – 2018. In addition, we will compare productivity among EU and world economy and also list empirical results from relevant literature.

Chapter 5 analyzes the concept of Institutions and present a brief overview of Institutional Theories that relate to economic development and growth. Then, the factors that affect development and growth are investigated. Econometrically, we analyze Institutions' Worldwide Indicators to see if they affect the development and growth of a country. The results of this survey will be compared with those of other empirical studies. The survey' s period is from 2002 to 2018 and the data have been extracted from the World Bank's database.

Finally, Chapter 6 presents the conclusions of this thesis which is an attempt to answer the initial question, namely how and to what extent the financial crisis of 2007 – 2008 affected the productivity and growth of countries that followed strict austerity policies and the role that the quality of Institutions had in their development.

Chapter 2: ECONOMIC CRISIS AND PRODUCTIVITY

2.1 Introduction

The second chapter of the present thesis begins with the definition of the productivity's term and the description of the factors that determine productivity. Then, we will explain the reasons that we divide European countries on high and low productivity and we will also explain the role that the Institutions of a country has on its productivity levels. Finally, we will mention how the Global Financial Crisis of 2007 – 2008 particularly affected Europe's productivity.

2.2 Productivity: definition and determinants

The term productivity refers to the quantity of goods and services that an employee can produce per hour of work. The role of productivity in defining the standard of living in a country is highly important, because an increase in productivity implies a better standard of living or in other words a country can achieve a high standard of living, only if this country produces goods and services in great quantities (G. N. Mankiw, 2011). In particular, the GDP of a country's economy measures two things: the total income earned from its production in the economy and the total cost of goods and services produced in the economy. For example, Western-Europeans have a better life than Africans because first ones are more productive. Another example is that Japanese nowadays achieve a better standard of living than Argentinians, because Japanese have succeeded a faster increase of their productivity. According to Gregory N. Mankiw in his book "Principles of Macroeconomics" (2015) the standard of living of a country's citizens depends on country's ability to produce goods and services. However, his point of view arise the question why some economies are much better at producing goods and services than others. The answer in this question is that every country differs at the following four determinants: physical capital, human capital, natural resources and technology as discussed below.

Physical capital: Physical capital or capital is the stock of equipment and the buildings used by workers to produce goods and services. Capital differs from the two primary factors of production, natural sources and human capital, in that it is a production means which it has also been produced. It is therefore classified as a derivative factor or a technical factor of production. The evolution of science nowadays makes this factor totally necessary in production as more and more complex products are being manufactured, such as machinery, computers, cars, buildings etc. Thus, any production process in which the participation rate of the "capital" factor is the highest is said to be capital intensive.

Human capital: Human capital or labor is a primary factor in production, is distinguished in the physical and mental and encompasses all human endeavors, both mental and physical, and all the human capacities that consciously used for the production of material and intangible goods. Human

capital, is also the economic term for the knowledge and qualifications that employees gain through education and experience. Thus, any production process in which the participation rate of the "labor" factor is the highest in the production process, then we say that the production process is labor intensive.

Natural sources: Natural sources are the means of nature, such as land, rivers and mineral reserves, and is a primary factor of production. Natural resources can be divided into two categories: renewable and non-renewable. For example, some well-known renewable energy sources are solar, wind and water energy, while examples of non-renewable energy sources are oil, coal and natural gas. Nevertheless, although natural resources are extremely important, they are not necessary for an economy to be highly productive. Japan, for example, is one of the richest countries, though it has scarce resources. On the contrary, international trade is what makes Japan successful, as Japan imports many of the natural resources it needs, such as oil, and exports its industrial goods to economies that are rich in natural resources. In general, natural resources are important but not necessary for the productivity and growth of an economy. However, they are needed worldwide.

Technology: The last but not the least determinant is Technology. Technology is the total of the scientific knowledge, the results of applied research and the systematic experiences used to production. Knowledge and the ability to use technology are called know-how and are of particular importance when referring to the use of modern advanced technology. Specifically, because of know-how is mainly produced by economically advanced countries, it is considered that its possession creates a comparative advantage and therefore takes the lead of those countries that produce it, use it and then dispose it in other countries. In addition, technology is embedded in technical capital (means of production) and know-how in the training and qualification of workers, which is why many believe that they are not a separate factor.

In terms of measurement, the productivity of a country's total economy is measured dividing Gross Domestic Product (GDP), by the total factors of production (land, labor, capital) that were used to produce it (GDP). So, in order to be able to calculate productivity, it is necessary to measure both the inputs and the outputs of a system. There are various indicators used to correlate inputs and outputs, the foremost of which is: the Total Factor Productivity Index (TFP). According to Classical Theory, productivity is defined as the residual of output that is not explained by the direct distribution of input resources. The residual is commonly referred to as total factor productivity (Solow, 1956) In economics, Total Factor Productivity or TFP, also called multi-factor productivity (MFP), is a variable which accounts for effects in total output not caused by traditionally measured inputs, such as labor (which is the most widely used) and capital. If all inputs are accounted for, then TFP can be

taken as a measure of an economy's long-term technological change or technological dynamism. TFP is also a crucial measure of efficiency and thus an important indicator for policymakers.

The components that define TFP are the following five:

Innovation: Creating new technologies leads to the development of high value added activities and improves the performance of the existing economic activities. However, history has shown that only a small number of countries has created new technologies, while many other countries have adopted the new technologies through adaptation, trade and foreign direct investment in research & development (R&D) (Coe et al., 1997; De Mello, 1999).

Education: Education and productivity are positively related for both developed and developing countries. Advancing knowledge and skills with strong basic foundation and sufficient specialization, is necessary for adopting, attaining and spreading new and better technologies, production processes and outputs. Some studies also, show that the number of schooling years or the completion rate of secondary and tertiary education is important in explaining the improvement of TFP (Benhabib et al., 2005; Erosa et al., 2010).

Market efficiency: The effective allocation of human and physical capital enhances the overall productivity. The nature and quality of regulations are often related to efficiency. For example, rigid regulations, such as high taxation, reduce flexibility in resource allocation in markets and decrease productivity. Some studies show that strict market regulations or the lack of reforms for promoting private corporate governance and competition, caused industries that use or produce IT to have meager productivity levels in several European countries and deterred firms from catching up to the international technology frontier (Nicoletti et al., 2003; Arnold et al., 2008).

Physical infrastructure: Transport, telecommunications, stable electricity supply, access to improved water and sanitation and other tangible infrastructure provide timely and cost effective access to markets and good physical environments for overall economic activities.

Institutional infrastructure: High quality institutions provide friendly environments and policies that lead to economic development. Governance and economic institutions are significant components of institutions and their quality is generally associated with productivity. Particularly, the studies of Barro (1991) and Chanda et al. (2008) that the quality of governance (worldwide indicators) is positively related to TFP and economic growth. In addition, Acemoglou et al. (2004) show that the quality of institutions contributes to economic growth more than geography and culture does. However, Dar et al. (2002) show that bad institutional quality, for example implementation of high taxation policies at businesses, negatively affects a country's economical growth.

The institutional infrastructure and in specific governance and institutions will be further analyzed in Chapter 5 of this present thesis, as it has major importance at the overall competiveness, productivity and growth of the economy.

2.3 The Global Economic Crisis and productivity in the EU

The Financial crisis 2007 – 2008, also known as the Global Financial Crisis is considered by many economists to have been the worst financial crisis since the Great Depression of the 1930s and is also the proof that history is repeating itself. The two most important crises of 1929 (stock market crash) and 2008, which have shaken the global economy, were the result of the over production crisis. Thus, as the economy follows a cyclical course and with the rapid growth of Gross Domestic Product (GDP) observed from 2002 – 2007, a slowdown of GDP according to the theory of economic cycles is expected.

The financial crisis began with a crisis in the subprime mortgage market in the United States, and developed into a full-blown international banking crisis with the collapse of the investment bank Lehman Brothers in September 15, 2008. Excessive risk-taking by banks such as Lehman Brothers helped to magnify the financial impact globally. The problem of the financial crisis began to take on a global dimension. The economic crisis spread very rapidly in Europe, and in particular in the European Union, because of its structure, which has as its main characteristic the interaction of economies between its states-members. Consequently, the interdependence of the European Economies among them made the risk of a massive collapse of their economies more intense ("domino effect").

Specifically, the European debt crisis, which also is referred as the Eurozone crisis or European sovereign debt crisis is a multi-year debt crisis that has been taking place in the European Union since the end of 2009. For instance, certain countries which are members of the Eurozone such as Cyprus, Greece, Ireland, Italy, Portugal and Spain were unable to repay or refinance their government debt or to bail out over-indebted banks under their national supervision without the assistance of third parties like other Eurozone countries, the European Central Bank (ECB), or the International Monetary Fund (IMF).

However, the causes of the debt crisis varied in each country. More particularly, in several countries, we observe that the private debts arising from a property bubble were transferred to sovereign debt as a result of banking system bailouts and government responses. This action has negative effects on these economies. The structure of the eurozone also as a currency union (i.e., one currency- the euro) without fiscal union (e.g., different tax and public pension rules) contributed to the crisis and limited the ability of European leaders to respond properly. In addition, because of the significant amount of

sovereign debt that the European banks own, the solvency of banking systems or sovereigns is negatively reinforcing.

From 2010 and thereafter, leading European nations implemented a series of financial support measures for the countries which have financial problems such as the European Financial Stability Facility (EFSF) and European Stability Mechanism (ESM). The European Central Bank (ECB) also contributed to solve the crisis by lowering interest rates and providing cheap loans of more than one trillion euro in order to maintain money flows between European banks. Thus, in July 2014 Ireland and Portugal completed their bailout programs and they returned to economic growth and they permitted the improvement of the structural deficits enables and both Greece and Cyprus managed to partly regain market access in this period of time (P. Petrakis, 2010).

The crisis, as it was natural, had significant adverse effects on productivity levels of the European countries. First of all, this economic crisis refers particularly to the banking sector, which as a result created liquidity problems. Liquidity problems with their order, create lack of both credibility and competitiveness of a country's economy. Consequently, all the problems that just mentioned above, contribute to adversely affect labor, which is one of the main productivity factor. More precisely, during the crisis' period is observed high unemployment rates and low incomes.

2.4 Europe: High and Low productivity

The Cobb-Douglass production function below is widely used to represent the technological relationship between the amounts of two or more inputs (particularly physical capital and labor) and the amount of output that can be produced by those inputs:

$$Y = A*L^{b}*K^{a}$$

where Y: total production (the real value of all goods produced during a year)

A: total factor productivity

L: labor input (the total number of person or hours worked during a year)

K: physical capital input (a measure of all machinery, equipment, and buildings)

a: capital elasticity (output)

b: labor elasticity (output)

a, b are also constants determined by available technology.

According to the Cobb-Douglass production function that is mentioned above, we can have either high or low productivity in a country. Particularly, the level of an economy's productivity growth is determined by the amount of per capita income (GDP per capita) and the well-being of its citizens. However, Simon Kuznets (Nobel Prize winner in economics, 1971) does not identify GDP with prosperity, saying that "GDP is useful as an estimate of the contribution of economic activity to the citizens' current and future well-being.". Nevertheless, productivity growth in an economy is a key factor in the medium-to-long-term growth of Gross Domestic Product (GDP). In fact, it is largely determined by the investment's growth rate, through which modern technological methods and innovative products are introduced, as well as the upgrading of human capital (constant education and training).

In general, the economy according to terms of real business cycles (RBC) economics tends to return to the level of output determined by supply-side factors, namely the capital stock, the technological level as well as the size and capabilities of the workforce. In more detail, the size of the capital stock depends on both the savings and the ability to attract financing, while the technological level depends on the country's ability to innovate (national production and innovation system, R&D) and to introduce new technologies based on the level of its infrastructure. Human resources competencies and skills depend on both the education and training system. In addition, the efficient and effective functioning of the productive business sector depends on the quality of institutions and the rules of organization of economic and social life and the quality of governance. In other words, a country's productivity is highly correlated with the productivity of a country's industrial sectors.

To be more specific, it is observed that countries in the northern part of Europe have higher levels of productivity than those in southern Europe because they have developed the industrial sector more, which is translated in gap of competitiveness. In the Eurozone, the gap between Northern countries (including Austria, Belgium, Finland, Germany, Luxembourg and the Netherlands) and Southern ones (Greece, Ireland, Italy, Portugal and Spain) has increased since the creation of the Economic and Monetary Union, being a persistent problem (Holinski et. al., 2012; Spahn, 2013; Lazar et al., 2013). According to the study of Holinski et al. (2012) the deficits in 2008, especially of Bulgaria, Cyprus and Portugal and as well as of Latvia, Lithuania and Romania, reached worrying levels. On the other side, countries such as Denmark, Germany, Luxembourg and Netherlands , in 2000 and 2008 registered current account surplus, while in 2013 were exporting more goods and services than were importing. Consequently, the competitiveness gap can be explained by the fact that some countries, mostly the Northern Euro-area countries, were able to translate higher competiveness into increasing trade surpluses and higher net factor income from abroad, while other countries such as Greece, Portugal and Spain had borrowing from abroad to maintain their negative balance and pay the interest.

on their debt. Furthermore, in terms of labor productivity, Austria, Belgium, Ireland, Italy, France, Netherlands, Spain, Sweden and United Kingdom were above EU 28, while Luxembourg is by far the most productive country of the European Union over the period 2000 – 2013.

2.5 The role of Institutions on productivity

Apart from the four determinants mentioned above, productivity may also depended on other factors such as the quality of the Institutions of each country. More precisely, the Institutions' quality directly affects the business' environment, which therefore consequently affects a country's total productivity levels. International surveys also show that the factors that affect the productivity of labor, i.e. the functioning of each employee, are identical to those that affect the productivity of businesses and therefore the economy as a whole.

The quality of a country's business environment is determined by a number of factors, such as the product market regulation, the justice system, the access to finance and the labor market regulation.

Product Market Regulation

The Product Market Regulation (PMR) is a set of rules laid down by the government, which governs the way markets of goods and services operate. These rules determine, for example, how easily new businesses or individuals can enter a market or the degree of competition therein. However, in order to be considered the PMR effective, government should facilitate businesses' new entry and reinforce competition. Low entry barriers, such as low taxation and simplification of bureaucracy, help to reduce production costs by allowing more efficient businesses to enter the market and intensifying competition and new investment. In a more competitive environment, in particular, businesses are strongly motivated to reduce both production costs and product prices. Consequently, lower costs and lower prices increase the productivity of the economy and benefit consumers.

Justice System

The effective implementation of the legal frameworks has a major impact on the quality of the business' environment, as businesses are unwilling to enter new markets if there are concerns that potential differences may not be resolved fairly and promptly by the country's justice system.

Access to finance

The access to finance of new businesses from the banking system in competitive terms, supports the investment plans of the new businesses while at the same time supports country's competiveness, productivity and employment.

Labor Market Regulation

The Labor Market Regulation (LMR) is a set of state-regulated rules which governing the relationship between businesses and employees. These rules set out the option by which companies can dismiss, hire part-time or full-time employees or ask employees to work overtime. Flexibility in the labor market also enables businesses to make new investments that have a positive impact on employment and wages. However, flexibility in the labor market should be accompanied by a strong social security system and employment protection legislation (EPL).

Other determinants that have a significant role at a country's both political and financial stability and therefore productivity are the following six indicators: Voice and Accountability, Political Stability and absence of Violence or/and Terrorism, the effectiveness of the Government (public services and policies), the quality of regulation, Rule of Law and the control of corruption. These determinants will be further analyzed at the Chapter 5.

Chapter 3: EU Countries with "Austerity Deal"

3.1 Introduction

The countries most affected by the financial crisis of 2007 – 2008 were Cyprus, Greece, Ireland, Italy, Portugal and Spain. Although the Treaty of Maastricht prohibited Eurozone states from financing the debts of other European states, legal safeguards were found to help countries facing such a problem. In particular, various rescue funds have been set up for these countries so that they can meet their financial obligations first and then gain their lost credibility and competitiveness in the markets as soon as possible.

3.2 The case of Cyprus

The financial crisis of 2007 – 2008 is considered to be the biggest in the history of Cyprus and mainly due to the fact that there was a large exposure of Cypriot banks to Greek bonds that was cut in spring 2012.

The problems in the Cypriot economy had already made their appearance since September 2011 where the Cypriot economy was degraded by all the major rating agencies. Although the country had a low population rate and its economy was limited, the country was experiencing particular growth in the banking sector. However, due to the interdependence between the two countries, Cyprus and Greece, Cypriot banks' exposure to Greek bonds reached 22bn euro, an amount larger than Cyprus's domestic product, they brought the island to the economic recession period.

One incident that confirms the difficult financial situation in Cyprus was the fact that Cyprus had to apply for a loan from Russia in order to meet its 2.5 billion euro financing needs. According to information published in the Cypriot press, the deal is for a 5-year loan at 4.5% interest rate, but in the end it was unable to meet Cyprus' loan needs by the first quarter of 2013. As the economy of Cyprus deteriorated increasingly and after the degradation of the Cypriot economy by Moody's, on March 13, and Fitch, on June 25, Cyprus was forced to seek financial support from the European Support Mechanism (ESM). The ESM's response was immediate as the Troika delegation arrived in Cyprus on 25 June to negotiate the terms of the loan. Negotiations continued for the next 3-4 months as Troika and Cypriot government did not agree with the terms of the loan. Finally, on November 30, 2012, Cyprus agreed to the terms of the Troika's rescue program. The agreement included, among other things, salaries and benefits cuts, taxation of luxury goods, fuel, gambling, etc. The only thing that had not yet been clarified was the amount about bank refinancing. For deposits up to EUR 100,000 the haircut was 6.7%, while for those exceeding EUR 100,000 it was 9.9%. The agreement was rejected by the Cypriot parliament on March 19 with 36 votes against, 19 abstentions and one absence. Six days later, on March 25, European Union Ministers of Finance and the IMF decide on a 40% haircut

on Cypriot bank deposits above EUR 100,000, while Cyprus and Laiki banks merge (S. Iordanidou et al., 2014).

In addition, we should emphasize that during the period from March 16 to 28, which was the peak of the crisis, the Cypriot government decided to impose Capital Control. Banks remained closed at that period of time and it was allowed only a specific cash withdrawal limit. To begin with, the daily cash withdrawal limit was 500 euros, but due to lack of liquidity on Friday, March 22, the daily withdrawal limit was reduced to 260 euros for all banks. Two days later, on Sunday 24 March, and ahead of the Eurogroup meeting, it was announced that the daily withdrawal limit would be further reduced to 100 euros. The implementation of Capital Control has caused liquidity difficulties for the citizens of Cyprus both in domestic and foreign transactions. Capital Control lasted two years in Cyprus.

A year later, Cyprus emits a positive image after applying the haircut, and the first report is positive. However, the overall picture of the Cypriot economy experienced a recession that was sharply lower than the predicted one (the forecast for contraction was 8.7% and moved at 5.4%). It has been very positive for Cyprus that the public administration and the state mechanism have successfully met the requirements set for the implementation of the "Austerity Deal". However, unemployment continues to rise from 11.8% in 2012, to 15.9% in 2013 and 16.1% in 2014. After the recession that the Cypriot economy experienced for the first time since 2011, it returned to positive growth rates of 1.6% in 2015. This shows that the economy is recovering and the exit from the recession is very near. Unemployment declined compared to 2014 and formed at 15.4% of the labor force. Total employment increased by 0.9% compared to the previous year which was -2.3%. Restrictions on the circulation of capital have gradually ceased to exist since April 2015. Then it is necessary to mention that GDP debt is constantly increasing. To be more specific, in 2012 GDP was 79.3%, in 2013 it increased significantly to 102.5%, in 2014 to 108.2% and in 2015 to 108.9%.

Additionally, 2016 was a very positive year for Cyprus as it managed to successfully exit the macroeconomic adjustment program at the end of March. This means that the ultimate goal of restoring confidence in the Cypriot economy and regaining access to capital markets has been achieved. The facts above have significantly improved its credit rating by up to 5 points, with Fitch's latest rating to maintain Cyprus's BB - to BB + credit rating with positive outlook. Forecasts show the Cypriot economy to grow at a rate of 2.5% over the period 2018 – 2020. GDP public debt is likely to be below 90% at the end of 2018 compared to about 100% at the end of 2015. Unemployment will continue to decline in the country and will fall below 12% by 2018 against 13, 3% in 2016 (G. A. Hardouvelis, 2014).

The following graph of Figure 3.1 shows the evolution of Cyprus' GDP per capita from 1975 to 2018. In particular, we observe that the country's Gross Domestic Product since 1975 has steady upward movement. In 2008 we see GDP reaching its peak at $ 32,727.14. At the same period, burst the global

financial crisis and it starts to affect the European countries. From 2008 to 2012 we observe that GDP start to decline. In 2014, GDP reduces to $ 27,182.50 , and then starts rising again to 2018 at $ 30,926.45.

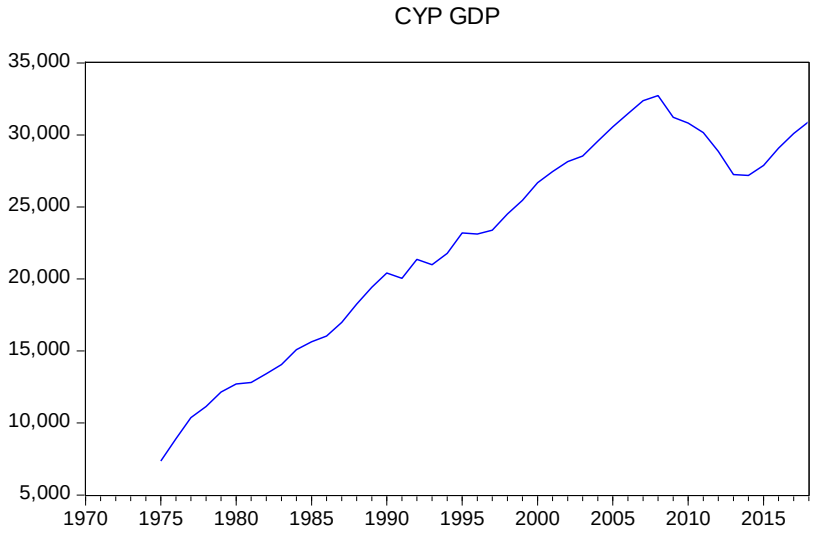

Figure 3.1: Gross Domestic Product per capita of Cyprus during 1975 - 2018

3.3 The case of Greece

Greece joined the Economic and Monetary Union (EMU) in 2001, abolishing its national currency, the drachma, and adopting the single currency used in the European Union, the euro. The integration of the country into the circle of European economies would be beneficial as it would follow the other developed European countries both socially and economically.

To be more specific, in the period 1994 – 1999 Greece managed to satisfy its macroeconomic and budgetary data in order to qualify the criteria of the Maastricht Treaty. So its achievements were:

I. Managed to reduce dramatically its fiscal deficit from 13.6% of GDP in 1993 to just 3.1% in 1999. Also, since 1994 a primary surplus has been created which has increased from 2.7% of GDP in 1994 to 4.3% in 1999.
II. The rate of economic activity increased rapidly from 2% of GDP in 1994 to 3.4% in 1999.
III. Inflation from double-digit rates before 1993 managed to reach 2.1% in 1999. There has also been a sharp decline in interest rates.
IV. All of the above have led to decline of public debt reaching 104.6% of GDP in 1999 and thus fulfilling the second financial criterion of the Maastricht Treaty and consequently after the achievements above, Greece was able to enter in EMU.

The first years of Greece's accession to EMU helped the country to grow economically, recording an annual growth rate of 4.2%.However, this rate was limited to the eight-year period 2001-2008 due to the recession recorded in 2007-2008 and on average the growth rate of the Greek Economy fell to 3.6%.Its first growth was mainly due to domestic demand, private consumption and private equity investment. In specific, much of the private equity investment was related to the real-estate market, which grew at an annual rate of 9.7% thanks to low-interest residential real estate loans. At the same time, inflation remained low with an annual average of 3.3%. However, this inflation rate in Greece was almost 1.5% on average above the EU inflation rate, making the Greek economy less competitive. In addition, according to ELSTAT data from the country's accession to EMU by 2007, international competitiveness decreased by 14% on the basis of relative consumer prices and by 19% on the basis of relative labor costs. Exports of goods and services grew at an average annual rate of 3.4%, with unemployment reaches almost 10% between 2001 and 2007 (Y. M. Ioannides et al., 2016).

All of the above have helped to develop domestic demand, but without existing such domestic production in order to enable to satisfy consumer needs both qualitatively and quantitatively. As a result, imports of goods and services (at an annual rate of 4.5% from 2001 to 2007) increased, which widened the current account deficit to unsustainable levels of 3% of GDP per year (1994 – 1999) to 8.5% (2000 – 2007). In 2007 the current account deficit was over 10%, while in 2008 it reached 14.9% of GDP. At the same time, exports of goods and services as a percentage of GDP remained below than in other European countries in 2007.

According to most financial analysts, the collapse of Lehman Brothers was crucial for the spread of the global financial crisis of 2007 – 2008. The economic crisis did not take long to spread to Europe and therefore to Greece, which was found in crisis completely unprepared and in debt.

The problems for Greece began when the rating agency Standards & Poor downgraded the country's credit worthiness from A to A- in 2009. In the same year, the country's real annual fiscal deficit had risen to 15%, which means that within one year the public debt increased from 110% to 125% of GDP. On October 20, 2009, Minister of Finance George Papaconstantinou announced to ECONFIN that Greece's fiscal deficit would be as a percentage of GDP at 12.5% instead of the 6% had estimated by the previous government. Two days after the announcement at ECONFIN, the Fitch rating agency downgrades Greece from A to A-, and almost a month and a half later the same agency downgrades Greece from A- to BBB +. The same attitude is followed by the rating agency Moody's, which in turn downgrades the country from A1 to A2. Also, we should note that in January for the first time the spread of 10-year bonds exceeds 300 points, and three months later it will reach 1000 points.

In January 2010, the World Economic Forum was held in Switzerland. There was also the Greek Prime Minister, who was pressured by foreign leaders to take immediate action, as the country's financial situation was at a limit. Thus, on his return to the country in February 2010, the first package

of austerity measures is announced to the Greek people. These measures calculated a benefit to the Greek state of 800 million euros (G. Provopoulos, 2014). Specifically, the first package, announced by the Minister of Finance, concerned:

I. Freeze the salaries of all civil servants
II. 30% overtime cut
III. Reduction of 10% benefits (excluding postgraduate study benefits, family allowance, hazardous and unhealthy work allowance)
IV. Trip cuts
V. Abolition of compensation for participation in working groups and committees. They will only be provided for the involvement of experts outside the public sector.

But over time there was the fear of stopping payments and bankruptcy, so one month later, on March 3, the second package of measures was announced. The government's goal is to add EUR 9.8 billion to the Greek fund in order to reduce the deficit. The following financial measures were taken for the second package:

I. Increase in VAT rates to 21% (from 19%), 10% (from 9%) and 5% (from 4.5%)
II. Increase in GFC on fuels, beverages and cigarettes.
III. The exemption for diesel fuel used by PPC for energy production is abolished
IV. 30% discount on Christmas, Easter and holiday gifts
V. Impose a 10% to 30% luxury rate on products such as cars, leather and jewelry
VI. Increase tax on offshore real estate from 10% to 15%
VII. 12% reduction in all government benefits
VIII. Restore living documents to all cars, regardless of cubism
IX. Imposition of an extra 2% levy on real estate worth over € 5 million.
X. 7% reductions in the salaries of employees of Public Utilities (PU), Legal Entities of Private Law (LEPL), Local and Regional Authorities (LRA).

With these tough austerity measures, there were reactions and numerous marches and strikes across the country.

However, the two consecutive austerity packages failed to upgrade Greece's performance in international markets, and unfortunately Greece was forced to resort to a support mechanism. The decision was announced by Prime Minister George Papandreou on April 23 from Kastelorizo. Greece signs an Austerity Deal, "Memorandum", in order to take help from the International Monetary Fund and the European Union. The following measures will be taken to activate the support mechanism which will be announced to the Greek people on May, 2.

I. Abolition of 13th and 14th salaries for civil servants with salaries over 3000 €. Lower-paid civil servants will be paid € 1000 against the 13th and 14th salaries.
II. An additional 8% cut in civil servants' allowances.
III. Abolition of the 13th and 14th pensions in pensions above 2500 €. Lower pensions will pay the amount of € 800 against the 13th and 14th pensions.
IV. Increase of VAT rate to 23% (from 21%), 11% (from 10% from 1 July 2010), 13% (from 11% from 1 January 2011) and 6.5% (from 5% from 1 January 2011)).
V. Increase the EFF on fuel, cigarettes and beverages by 10%.
VI. Increase in real estate values.
VII. The minimum retirement age is adjusted to 60 years.
VIII. Raising the retirement age for women in the public sector to 65 years.
IX. Imposing a new special tax on highly profitable businesses.
X. Taxes on gambling.

The Greek people are once again showing their indignation at the even tougher financial measures with protests, marches and nationwide strikes on May 5. But in vain, as the next day, May 6, the Parliament voted in favor of Memorandum. The members of PASOK (governing party) who opposed the Memorandum and did not vote were expelled from the party. During this period there are downgrades in Greece's credit rating by rating agencies. Specifically, Moody's ratings downgrades Greece from A2 to A3, while Standard & Poor's ratings downgrades Greece from BBB + to BB +.

Finally, on May 8, a loan agreement between Greece and the European Union Member States for a loan of 80 billion euros is signed, and two days later, on May 10, a loan agreement between Greece and the IMF is signed for a loan of 30 billion euros. Greece's summit on 12 March 2011 has managed to address two very serious issues. Initially, Greece secured the loan repayment extension to 7.5 years and secondly managed to reduce the interest rate by 1%, i.e. 100 basis points, which resulted in Greece earning 6 billion euros.

Nevertheless, in 2011, Greece is constantly downgraded by rating agencies. Standard & Poor's downgrades Greece to BB- and a short time later to B. Then Fitch downgrades Greece at B +, while Moody's to Caa1.

On June 29, 2011, the Hellenic Parliament approved the Mid-Term Fiscal Strategy Framework 2012-2015. which provided for a number of new measures to reduce expenditures and increase revenues:

I. Increase the living presumptions by 70% on average
II. Increase the amount of receipts to 25% of income to be tax-free

III. Tax deduction reduced to 10% from 20% on loans' interests for annual personal income above 40,000 €
IV. Impose of an annual fee for freelancers and traders
V. Imposition of a progressive objective cost of housing
VI. Imposition of a special solidarity levy of 2% in order to combat unemployment
VII. Increase in traffic charges
VIII. Imposition of a special levy at retired who have a supplementary pension
IX. Suspension of first auction from 1 July until 31 December 2011
X. Abolish the tax deduction with receipts
XI. Special levy from those who have an annual income of over 12000 €

On July 21, a European Union Summit was held on the topic of debt crisis in Greece and its treatment. So, the 17 leaders have decided to provide a new loan of EUR 158 million for Greece. However, Greece was off target in September resulting in a huge increase in expenditure and a decrease in revenue. The German Minister of Finance then proposes to the Greek Minister of Finance that Greece has to leave the Eurozone for some years and in return EU would given an "enormous" aid. Greece, of course, never accepted it. The Greek government is in a deadlock as the Troika sees the risk of defaulting on the 6th installment of the loan. Thus, the Greek Minister of Finance officially announces emergency measures on September 11 in order to be able to pay the installment. More specific:

I. Reduction of tax free threshold to 5000 €
II. Reductions in salaries, pensions and lump-sums
III. Imposition of a new one-off tax on powered properties to be added to PPC's account by 2014

The imposition of the new measures, of course, has prompted Greek citizens to take part in demonstrations and strikes all over the country. However, an emergency European Union Summit was convened again on 23 October. The goal this time was to find a definitive solution to the Greek economic crisis. On October 27, the decision of the Summit announced that it was aiming to "cut" 50% of the Greek debt, i.e. to reduce the value of Greek bonds held by the private sector. In addition, by the end of 2011 a new multi-annual program of EUR 100 billion will be finalized. For this to be finalized, there must be the approval of the 17 Member States and after the approval new measures will follow. Finally, it was decided the permanently Troika surveillance in Greece to monitor daily implementation of the mid-term program.

These developments have triggered many reactions from both the Greek people and the political opposition. The solution to this problem was thought to be a referendum. The referendum would urge

Greek citizens to vote “Yes” or “No” to the new loan agreement. However, there were negative reactions from Europe to this decision and it was considered that Greece was now going bankrupt. After these events the referendum was not implemented and on 12 February 2012 the Parliament was called to vote on the second Memorandum. Eventually the new program was approved by Parliament with 199 “Yes” (G. Provopoulos, 2014). So the new measures that follow the Second Memorandum are:

I. Pensions reductions
II. 22% salary reductions at all levels
III. An additional 10% reduction in salaries for young people up to the age of 25
IV. Abolition of permanency in Public Utilities
V. Reduction of civil servants by 150,000 employees
VI. Restrictions on admissions to police and military schools

On November 7, 2012, the Mid-term Financial Strategy Framework 2013-2016 was approved by Parliament. The new program contains measures totaling € 18.9bn.

I. Reductions in pensions over 1000 €
II. Wage reductions
III. Reductions to the lump-sums up to 83%
IV. Abolition of Christmas and Easter gifts
V. Increase in tax on LPG
VI. Reduce of redundancy warning time
VII. New emergency contribution to photovoltaic

It is also worth to mention that on December 18, the repurchase of bonds (PSI) was completed, which reduced Greek debt by € 20.6 billion.

Three Troika visits took place between September and December 2013 but there was no agreement on the fiscal gap until 2016 and the fiscal gap for 2014. There was no agreement on either the 2014 budget or the Mid-Term Program 2014 – 2017. In the opposite, closed the agreement for the conditions of the EUR 1 billion installment.

However, in 2014 we would say that it brought prosperity to Greece. More precisely, the Mid-Term Fiscal Policy Framework 2015 – 2018 was approved, while many rating agencies had begun to review and upgrade Greece. Finally, disbursements from the European Fund and the International Monetary Fund naturally done.

But prosperity has not lasted long, as 2015 is a year of many upheavals. Rating agencies are starting to downgrade Greece again. A Eurogroup is being held in June in which the European Union and the IMF argue that Greece's financial situation has reached an impasse and that existing measures are insufficient. They conclude, then, that the only solution is a new Memorandum. The day after the Eurogroup, the Prime Minister of Greece announces a referendum in which the Greek people were called to vote "YES" or "NO" on the new agreement. After the above events there has been an unexpected development. On June 28, capital controls are imposed on banking transactions with a Legislative Act. The referendum takes place on July 5 and the "NO" holds 61.3%. However, on August 14, the third Memorandum is signed. Finally, in 2016, according to ELSTAT data, there was a recession and a decline in consumer expenditure. Also pleasant are the news for 2017, as the Ministry of Economy and Economic Development Bulletin states that "2017 was a landmark year for the Greek economy as it pulled it out of the multi-year financial crisis and recession by restoring it to its growth path".

The graph of Figure 3.2 below shows the evolution of Greece's GDP per capita from 1970 to 2018. In particular, we observe that the country's Gross Domestic Product from 1970 to 1996 has a lot of fluctuations. But, from 1997 the Greek GDP begun to rising rapidly as there was prosperity in the country and even more in 200, which was the entry year of Greece to the Eurozone, until 2007, where reaches its peak at $ 30,054.89. At the same period, burst the global financial crisis and it starts to affect the European countries. So, from 2008 to 2013 we observe that GDP starts to decline, as during that period Greece had to follow austerity measures due to financial crisis. During 2014 - 2018, the country makes its first efforts to overcome this crisis and sustain its GDP value in a competitive level.

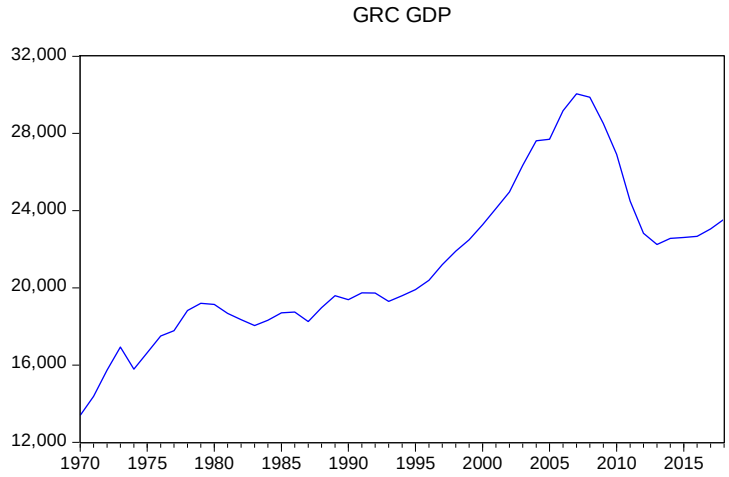

Figure 3.2: Gross Domestic Product per capita of Greece during 1970 - 2018

3.4 The case of Ireland

Ireland could also be an example for other European countries facing the problem of the economic crisis. From 1995 – 2007 it had managed to keep its economic growth high, setting a record and ranking as one of the richest countries in the 5th position in the OECD.

However, due to a series of events, Ireland is facing a recession for the first time. The causes of the Irish crisis were initially the cheap money that flowed internationally until 2007 and the inadequate regulatory intervention that allowed the Irish interbank market to over-lend, creating a huge bubble in the real estate market. Until that time, the country's public finances had a very good picture, while its public debt stood at 24.9%.

After the collapse of Lehman Brothers in September 2008, Irish banks were faced with a liquidity crisis that forced the government to announce a two-year guarantee on all deposits, interbank and bond loans to six credit institutions. This guarantee is estimated to have cost 400bn euros that was double of Irish GDP and proved devastating. Two years later, in November 2010, and after already two years of recession, Ireland entered into an "Austerity Deal". Its fiscal position worsens after the collapse of revenues due to falling property markets and government debt guarantees for banks. Government debt was estimated to reach 94.2% of GDP by year's end. At that time, there was great uncertainty in the markets as the issue of Greek bailout was raised, and especially after the Franco-German agreement in Deauville, which required individuals to participate in government debt restructuring, leading Irish bonds to rise and reach unsustainable levels (S. Dellepiane et al., 2011). Although the Minister of Finance Brian Lenihan did not formally admit that he would seek financial assistance and on November 14 he sent a technical staff to Brussels to find out the terms of a possible deal. Then, on November 16, the Eurogroup asked the Minister of Finance to accept the aid, but Dublin tried to resist. On 18 November, the European Central Bank (ECB) demanded Ireland to decide whether to accept the assistance they provided. In case of Ireland did not accept this assistance the ECB would stop funding the Irish Central Bank. Dublin, under pressure from the ECB, received the aid on 28 November and the EU and IMF approved the loan in Ireland. Ireland's rescue package was 85 billion euros and only 17.5 billion out of 85bn came from Irish sources. European countries provided EUR 45bn from the rescue fund at a rate of 5.8%.

Moreover, in order to reduce the fiscal deficit from 30% to 3% until 2015, the government is imposing austerity measures. The austerity measures were part of the agreement with a four-year plan for further fiscal consolidation of around € 15bn. In addition, Ireland appeared to respond and complete its consolidation plan as its economy grew 7% on a year basis against forecasts of 6% in the third quarter of 2015. The growth rate achieved in 2015 is considered to be the highest rate of economic growth in and before crisis since 2000. It is worth saying that, Ireland's GDP increased fourfold from that of the euro area, which was 1.6% for the same period. According to Austin Hughes, an economist at the

KBC Groep in Dublin, the economy of Ireland would have seen its highest growth since 2000 and would have climbed to 10.2%. Finally, although it was forced to join a fiscal adjustment program, in 2015 it managed to have the fastest growth rate in the euro area for a second consecutive year. Employment rose 3%, exports 12% and private consumption 3.6%. Ireland has been doing the impossible since today as it has managed to get back to development and is trying to recover "the lost territory". This fast recovery was because it was very dynamic and experienced in its export sector at pre-crisis. Ireland also had made a slight comeback in the bond markets (OECD, 2018).

The following graph of Figure 3.3 shows the evolution of the Irish GDP in nominal values from 1970 to 2018. Particularly, we observe that the country's Gross Domestic Product has an incredible steady upward movement reaching a peak in 2007 ($54.568,67). After that point, Irish Economy starts to have problems because of the economic recession and the austerity measures that Ireland had to deal with and as a result its GDP declines. However, Irish Economy recovered fast as its GDP grew rapidly reaching $ 78,764.63 in 2018.

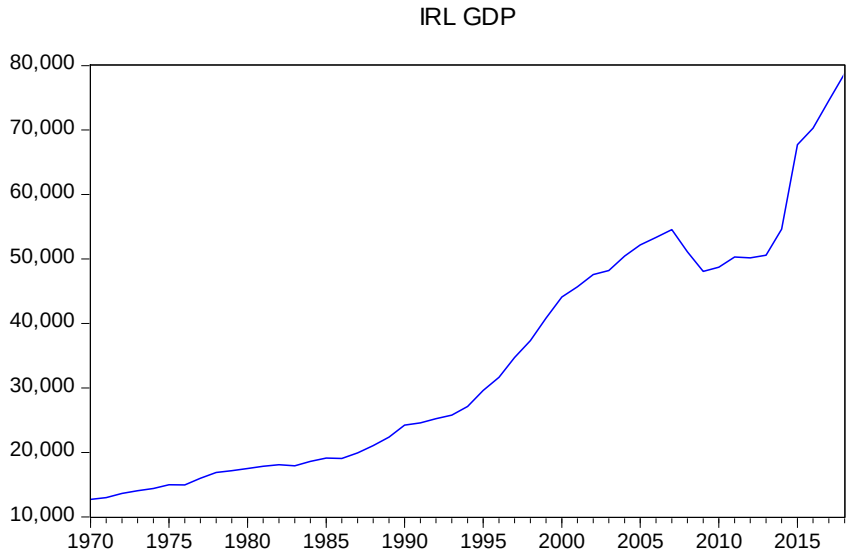

Figure 3.3: Gross Domestic Product per capita of Ireland during 1970 - 2018

3.5 The case of Italy

Although Italy was Europe's third largest economy in 2013, it has also officially found itself in an open economic and political crisis. The crisis in Italy was deeply depended in structural weaknesses in its economy and inadequate political staffing. Due to the reasons above, the Monty government decided to implement austerity packages for three consecutive years in order to prevent Italy from resorting to the European mechanism. To be more specific, for 2012 the first austerity package was 10.5 billion plus 4.5 billion, 10.9 billion for 2013 and 11.7 billion for 2014. However, the fact that Italy avoided joining a support mechanism is due to its industry and its large exports (I. Visco, 2018).

A referendum was held in December 2016 on whether Italy should get its first Memorandum or not. Although the EU tried to intimidate Italian citizens to vote "Yes" because non-performing loans had exceeded 400 billion euros and there was a risk that Italy's banking system would collapse. But the referendum result was 59.2% "No" and 40.8% "Yes". So in 2016, Italy is in a red alert because of the extreme poverty in the country. The country is experiencing the worst poverty of the last eight years because of the poverty and the misery that experience 4.6 million people. Italy is a developed country in the south Europe which loses the battle for social balance and lives in a "Memorandum" without having sign an actual Memorandum.

The following graph of Figure 3.4 shows the evolution of Italian GDP per capita from 1970 to 2018. From 1970 and almost for every year GDP growth of the country has a steady uprising movement. There are only some slightly contractions of GDP in 1976, 1984, 1994,1999, 2003, 2008 and 2013. Moreover, we have to say that the austerity measures that the Italian government implemented in 2012 and the referendum in 2016 did not significantly affect Italy’s Gross Domestic Product.

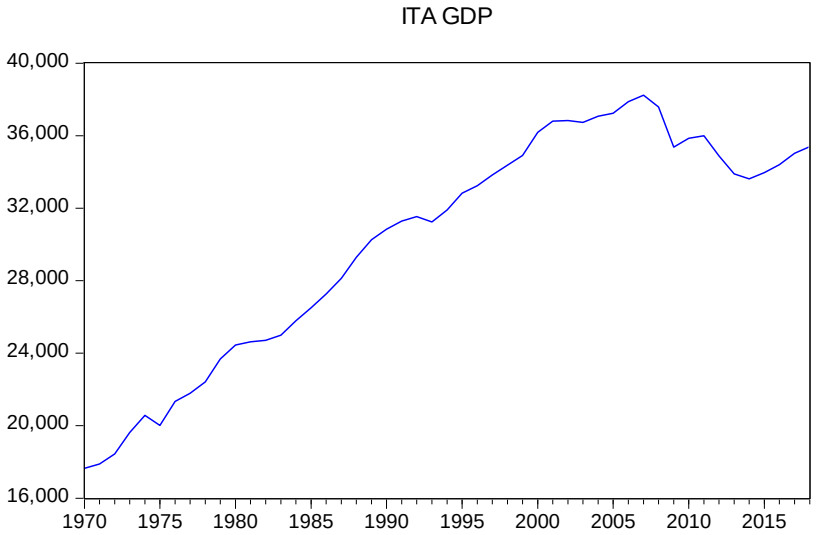

Figure 3.4: Gross Domestic Product per capita of Italy during 1970 - 2018

3.6 The case of Portugal

Another country that had to seek financial assistance from the European Union was Portugal. In 2010, the Portuguese Parliament approved the 2011 budget, including measures to reduce public sector wages by 5% and to increase VAT from 21% to 23%. At the same time, consumption continues to have problems in an economy whose unemployment reaches 10.6%. So in May 2011, the major Portuguese parties sign and seek support from the EU and the IMF. The program is accepted and in June 2011 Portugal signs an € 78bn "Austerity Deal". The government's aim was to directly capitalize banks and reduce its government debt by 5% of GDP. A second and equally important objective was to reduce the fiscal deficit to below 3% of GDP and according to Eurostat data unemployment was 12.9% that year (S. Gurnani, 2016).

Next year finds Portugal in a difficult position as the government votes on tough austerity measures such as wage cuts, pension cuts and a significant tax increase. Unemployment now reaches 17.3%, while austerity measures continued in 2013 with unemployment reaching 17.5% but at the end of the year it dropped to 15.3%. Portugal, following in the footsteps of Ireland, managed to get out of a € 78bn bailout in spring 2014. However, wages and pensions are falling even lower as taxes continue to rise. Unemployment has begun to fall sharply to 13.5% while debt stands at 129% of GDP (L. Correia, 2016).

The graph of Figure 3.5 below shows the evolution of Portuguese Gross Domestic Product per capita for the period 1970 – 2018. In particular, we observe that the country's GDP every 10 years reaches a new peak since 1973. In 2013, GDP dropped but the rest years until 2018 we can see a recovery effort, as Portugal was one of the countries that had to follow strict policies in order to overcome the financial crisis of 2007 – 2008.

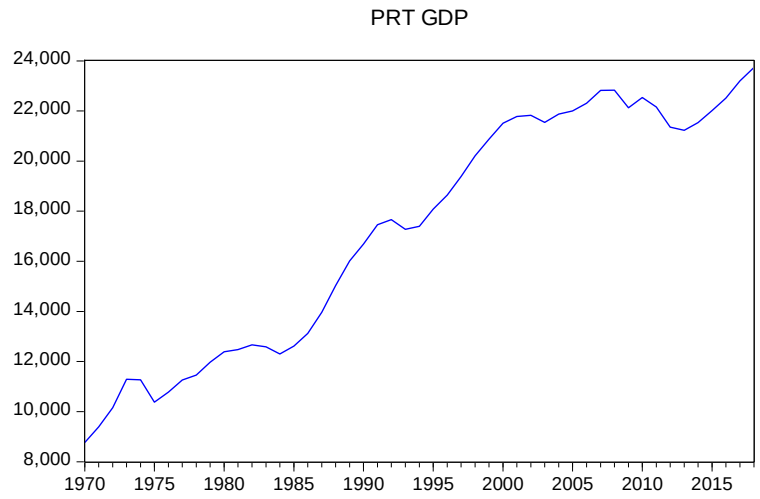

Figure 3.5: Gross Domestic Product per capita of Portugal during 1970 – 2018

3.7 The case of Spain

After the collapse of the Lehman Brothers, another country that was affected by the recession of 2008 was Spain. In specific, due to the creation of the real estate bubble, the economy's growth rate fell from 3.5% to 0.9%. In addition, the country's credit rating in 2009 is downgraded from AAA to AA + by Standard & Poor's while the country's fiscal deficit reached 11.9% of GDP.

In more detail, in the first quarter of 2010, unemployment reaches 20% which is a high record after 13 full years, with 4.6 million people facing unemployment. In May 2010, austerity measures were announced, such as cuts in public sector wages, an increase in VAT from 18% to 21% and a freeze on the increase in pensions. While in the beginning austerity measures were estimated at 1.5% of GDP afterwards, with the decline in purchasing power, austerity measures reached 5% of GDP. At the same time, there is a sharp increase in public debt, as in the first three years of recession GDP was 40.2% of GDP in 2008, 54% in 2009 and 61.7% in 2010. A year later, the overall unemployment rate peaked at 21% while the youth unemployment rate reached 40%, with 4.9 million unemployed.

On December 30, 2011 following the election of Mariano Rajoy, he claims that the budget deficit was 8% of GDP while the default target was 6%. It soon announced new austerity measures that would be implemented from the new year and foresee cuts in public expenditure of 8.9 billion euros. The unemployment rate climbed to 22.85% or otherwise 5.27 million unemployed people, which constitutes the largest unemployment rate in the euro area that period of time. The newly-elected government aims to save 27 billion euros in wage cuts, public expenditure and taxes. The country's Prime Minister, Rajoy, pledged to cut the budget deficit from 8.5% of GDP in 2011 to 5.3% in 2012 (F. Carballo-Cruz, 2011).

In the first semester of 2012, Spain's fourth-largest bank, Bankia, faced a liquidity problem and asked for a 19 billion-euro government loan to avoid bankruptcy. The Rajoy government has nationalized the Bankia bank, which still holds 10% of domestic deposits. Spain announced on July 9th that it was unable to meet the banks' capital requirements, saying that the country would seek a 100 billion euro loan from the Eurozone countries. The Eurogroup, which was composed of the Ministers of Finance of the Eurozone, decided to finance Spain, with its borrowing costs soaring to the highest level since the euro's circulation (1999).

In December 2012, austerity measures amounting to EUR 39 billion were approved by the parliament, while at the same time unemployment exceeds 25% and young unemployed people less than 25 years old reach 55%. Spain's public debt from 70.5% of GDP in 2011 went to 86% in 2012 and the budget deficit was 6.7% of GDP while the target that was not finally achieved but had agreed with the EU was 4.5 %. In 2013, public debt increased from 89.6% in May to 90.2% in June. In addition, we can

observe that before the financial crisis of 2008 erupts, Spain's public debt was 40% of GDP, which means that within five years GDP had doubled.

We should also point out that 'red' loans, that is, loans that borrowers fail to repay, recorded an increase from 187.83bn in September 2013 to 190.97bn in October of the same year, setting a new record. While according to data announced by the Bank of Spain, non-performing loans accounted for 13.07% of total loans of November and the country's public debt reached 93.4% of GDP in September 2013. At the same time, the total amount of loans amounted to EUR 1,471m. According to UNICEF's report in Spain, 2,306 million children (27.5%) under the age of 18 live below the poverty line. Spain, as the fourth largest economy in the eurozone, completed in 2014 with 97.6% of GDP public debt and announced that it would reduce the corporate tax rate from 30% to 25%. At the same time, the income tax rate will be reduced from 52% to 45%. The government in its effort to eliminate tax evasion limits tax exemptions and broadens the tax base.

The following year observed an increase in Spain's exports, which was equivalent to one third of GDP, which was similar only in Germany from the Eurozone countries. However, although Spain reduced its deficit, on the other hand it increased its public debt. In particular, since the beginning of 2015 Spain's public debt reached 2.7 trillion euros, which is more than tripled since 2007 when the global financial crisis broke out.

In Spain the average wage is considered one of the lowest in Western Europe, with 2.2 million out of the 18 million workers earning less than 60% of the average wage. The long-term unemployed are over 2.5 million, which affects negatively country's productivity. Spain also has the highest proportion of school leaks in the EU because ¼ of young people aged 18-24 have not completed high school (E. Ortega et al., 2012).

However, a number of events have helped the country escape the recession that has plagued it for three consecutive years. More precisely, low inflation, improvement of labor market image and the increase of tourism boosted consumption at the country in 2016. The overall picture of the growth rate for the Spanish economy in 2016 was 3.2%, noting the best performance among the developed economies.

The following graph of Figure 3.6 shows the evolution of Spanish GDP per capita during 1970 – 2018. In particular, we observe that the country's Gross Domestic Product had a slowly and steady progress reaching in 2007 its peak ($ 32,459.92). After 2008, Spain experiences a recession which explains the decline of country’s GDP. Therefore, from 2015 we observe the rise of Spain’s Gross Domestic Product.

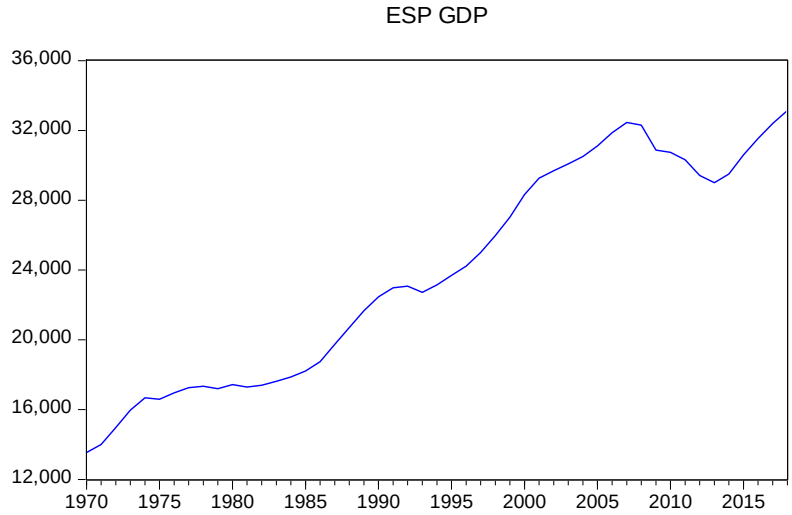

Figure 3.6: Gross Domestic Product per capita of Spain during 1970 - 2018

3.8 The spread of economic crisis to other European countries

The crisis of 2007 did not leave the UK economy untouched which had a period of severe recession and then a slow recovery. During the recession, Britain nationalized banks in order to avoid bankruptcy. The emergence of the crisis has brought many regulatory and structural problems to the system, so consequently a law was passed by the government in April 2013 that would significantly enhance the central bank's oversight of the entire financial system. Nonetheless, it is worth to mention that the UK has managed to keep its unemployment rate almost stable, considering that since the financial crisis in 2007, unemployment had risen only 1% by 2014. This performance was the best from the G7 countries with the exception of Canada and Germany. But the relative improvement in the UK labor market did not help from a budgetary point of view. Britain's budget deficit has risen by 2.4% over the past 7 years, a performance that is worse than the performance of Germany, France, Italy and the US. However, 2015 was a rather good year for Britain as its unemployment rate dropped to the lowest level since the crisis began in 2008. In particular, the unemployment rate fell to 5.4% in June - August 2015 versus 5.5% in April - May. The number of workers increased by 140,000 while the number of unemployed fell by 79,000.

A summit of EU member states was held in December 2015 to discuss Britain's demands presented by the country's Prime Minister, David Cameron. In mid-February 2016, a meeting was held in Brussels with EU leaders where the 27 Member States agreed to sign a reform program for Britain. But unfortunately, not all of David Cameron's requests were accepted in this program, with the result on February 20th would be announced that June 23 would be the date for a referendum. On June 23, 2016, the British vote and answer the question of whether or not Great Britain should remain a member of the EU. The following morning the outcome of the referendum was announced, with 51.89% wanting Britain to leave the EU and with 48.11% wanting to stay in the EU.

Denmark is the country with the highest private debt in the world affected by the effects of the global crisis. But in the case of Denmark, because of the country's economic model and the culture of the political system and citizens, it helps to form a shield in adverse conditions. In Denmark, the problem of the financial crisis began with the collapse of Roskilde Bank in the summer of 2008 and by the fall of 2010 it recorded the largest losses in the banking system. Danske Bank, the country's largest lender, lost 135,000 deposits from 2012 to 2014 while customer confidence staggered and fell at the lowest levels of the last six years according to Voxmeter data.

In other words, the Danish economy has lost significant competitiveness since having fallen from 3rd place globally in 2008 to 12th place within 5 years , while private debt was a major problem at that time, as Danish households had the highest debt / income ratio (321%) in the world. Even today Denmark has managed to keep its economy at a very high level, its unemployment has almost fallen to zero, which is why the Danish bank is warning the Danish authorities that it fears that if labor shortages generalized, the growth of the economy for the next years could be threatened. From the above we can see therefore, that Denmark is practically a social state.

On the other hand, Germany is considered one of the strongest economies in Europe, which is why many analysts believe that not only was it not affected by the crisis, but rather favored. In 2013, when most European Union countries were in recession, Germany managed to show a surplus in its trade balance. Particularly, in September 2013 German trade balance increased to 20.4 billion from 13.3 billion in August. Its exports to other European countries stood at € 54.8bn in September while imports stood at € 48.2bn. In one year, its exports to EU countries increased by 5.4% and imports by 2.6%. Germany was the 3rd largest exporter in the world for 2012 with exports of goods and services exceeding 1.36 trillion euros. Also, in 2012 Germany has the lowest unemployment rate since 1990, at 6.8% of the active unemployed population. Over the years, the unemployment rate remains low and in 2016 the lowest rate was recorded, reaching 6.1%.

The only downside to Germany is that in April 2013 its credit rating was downgraded from A + to A by Egan Jones credit rating agency. That downgrade, according to analysts, is attributable to fears that German banks will face problems, i.e. that its debt will increase as a percentage of GDP and as a result Germany will suffer from the recession that other European countries are facing too. However until today, the German economy is in good progress and all the forecasts indicate that this will be continued also for the following years.

Another European country, Finland, in 2012 its economy started to fall reaching its worst performance in the first three quarters of 2015. According to the Minister of Finance Olli Rehn "Finland has become a deficit economy and is 10-15 % behind Sweden and Germany in terms of competitiveness ". Moreover, according to a survey by the World Economic Forum in 2016, Finland has fallen from fourth to eighth place in global competitiveness. Although Finland was one of the strongest economies

in western Europe, some cases managed to overturn its economy. A major blow to exports was the fall in orders from Russia. Then, with the weakening of the domestic paper industry and the collapse of Nokia's consumer electronics unit Oyi, it was a decisive combination of undermining its economy.

Consequently, realizing that the country's financial situation was deteriorating and in order not to be forced to resort to a support mechanism program, Finnish Prime Minister Juha Sipila suggested that some measures be implemented to avoid an economic crisis. The austerity measures that applied at Finland was less severe than those applied in the southern European countries. It was also very positive for Finland that had the support of the international credit rating agencies as they maintained the country's credit rating to AAA. This "favor" was very important as the countries that continue to have AAA credit ratings in the eurozone are few (European Commission, 2014; S. Marginean et al., 2011).

Chapter 4: DATA & DESCRIPTIVE STATISTICS

4.1 Introduction

This Chapter analyzes the variables and the data that will be used in our survey. The data that will employ are: the GDP per hour worked and the GDP per capita. The first variable constitutes a productivity measure, while the second one indicates a country's economical growth. Specifically, graphs and tables of the descriptive statistics will be presented at the following analysis.

4.2 Data & Descriptive statistics of GDP per capita

To begin with, in this chapter we will describe the Gross Domestic Product (GDP) per capita of the countries which have followed an "Austerity Deal" or otherwise a "Memorandum", the countries that belong to the European Union (EU), the countries that belong to the Eurozone area (euro-currency), the OECD countries, the countries that belong in Latin America & Caribbean and the countries that belong in East Asia & Pacific. The data have been extracted from the database of the World Bank (WB).

The European Union constituted by 28 countries, which are listed below according to the year of their annexation to the Union:

1/1/1958	Belgium (BEL)		**1/5/2004**	Estonia (EST)
	France (FRA)			Cyprus (CYP)
	Germany (GER)			Latvia (LAT)
	Italy (ITA)			Lithuania (LTU)
	Netherlands (NLD)			Malta (MLT)
	Luxembourg (LUX)			Hungary (HUN)
				Poland (POL)
1/1/1973	Denmark (DNK)			Slovakia (SVK)
	United kingdom (GBR)			Slovenia (SVN)
				Czech Republic (CZE)
1/1/1981	Greece (GRC)			
			1/1/2007	Bulgaria (BLG)
1/1/1986	Spain (ESP)			Romania (ROU)
	Portugal (PRT)			
			1/7/2013	Croatia (HRV)
1/1/1995	Austria (AUT)			
	Sweden (SWE)			
	Finland (FIN)			

Table 4.1: The countries of the European Union (EU)

Although all EU countries are part of the Economic and Monetary Union (EMU), 19 of them have replaced their national currencies with the single currency – the euro. These EU countries form the euro area, also known as the Eurozone. The Eurozone countries are: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia and Spain.

The 9 countries that belong to the European Union but have kept their national currency are: Bulgaria, Czech Republic, Denmark, United Kingdom, Croatia, Hungary, Poland, Romania and Sweden.

OECD has 36 member countries span the globe, from North and South America to Europe and Asia-Pacific. So, the OECD countries are: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States.

Latin America & Caribbean have 33 countries: Antigua & Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts & Nevis, Saint Lucia, St Vincent & Grenadines, Suriname, Trinidad & Tobago, Uruguay and Venezuela.

East Asia & Pacific have 31 countries: Australia, Brunei, Burma, Cambodia, China, Fiji, Indonesia, Japan, Kiribati, Korea (North & South), Laos, Malaysia, Marshall Islands, Micronesia, Mongolia, Nauru, New Zealand, Palau, Papua New Guines, Philippines, Samoa, Singapore, Solomon Islands, Taiwan, Thailand, Timor – Leste, Tonga, Tuvalu, Vanuatu and Vietnam.

The following table represent the Gross Domestic Product (GDP) per capita in US dollars of the European countries which followed an "Austerity Deal": Cyprus, Greece, Ireland, Italy, Portugal and Spain. Table 2 represents also the GDP per capita of the Eurozone, the European Union, the OECD members, Latin America & Caribbean (excluding high income) and East Asia & Pacific (excluding high income). The survey refers to the period of time 1970 – 2018.

Year	CYP	GRC	IRL	ITA	PRT	ESP	EUROZONE	EU	OECD (Total)	Latin America & Caribbean	East Asia & Pacific
1970	-	13.392,31	12.708,77	17.653,02	8.770,31	13.542,96	17.519,96	15.318,94	17.034,30	4.784,86	357,70
1971	-	14.379,90	12.996,81	17.890,32	9.391,61	14.002,87	18.085,72	15.793,39	17.477,04	4.977,99	371,73
1972	-	15.738,28	13.636,10	18.445,55	10.160,07	14.977,78	18.847,76	16.434,14	18.226,73	5.225,23	381,10
1973	-	16.934,80	14.052,72	19.626,39	11.294,58	15.966,92	19.885,22	17.335,78	19.146,23	5.570,06	403,20
1974	-	15.786,27	14.410,67	20.570,82	11.265,42	16.680,81	20.408,65	17.625,43	19.146,28	5.800,61	411,46
1975	7.353,17	16.634,47	14.977,36	20.020,92	10.373,80	16.590,88	20.150,75	17.398,41	18.985,46	5.908,75	429,62
1976	8.915,35	17.500,31	14.958,80	21.340,77	10.778,66	16.958,83	21.069,51	18.114,00	19.706,90	6.132,70	436,50
1977	10.372,83	17.782,12	15.969,38	21.794,43	11.262,33	17.261,66	21.632,18	18.545,08	20.249,49	6.274,00	462,88
1978	11.138,17	18.825,09	16.875,91	22.420,57	11.455,21	17.346,36	22.219,22	19.066,20	20.932,64	6.357,53	496,16
1979	12.146,66	19.202,06	17.164,31	23.688,06	11.972,13	17.201,26	22.978,79	19.717,98	21.563,68	6.619,58	523,28
1980	12.706,70	19.143,12	17.490,41	24.450,14	12.386,89	17.440,58	23.373,53	19.924,98	21.669,43	6.860,48	554,65
1981	12.812,01	18.677,48	17.861,60	24.626,98	12.478,65	17.294,10	23.403,90	19.914,81	21.936,73	6.719,49	577,85
1982	13.423,72	18.352,44	18.097,56	24.710,52	12.667,44	17.404,85	23.507,40	20.054,49	21.823,35	6.565,19	602,35
1983	14.056,66	18.049,18	17.925,81	24.990,36	12.586,98	17.626,85	23.784,28	20.374,45	22.264,88	6.269,63	635,83
1984	15.090,91	18.320,58	18.590,80	25.790,75	12.302,94	17.867,09	24.306,65	20.828,41	23.115,50	6.369,75	684,92
1985	15.636,48	18.707,57	19.133,79	26.504,73	12.613,79	18.215,74	24.820,95	21.322,03	23.801,87	6.466,69	722,62
1986	16.030,74	18.742,32	19.043,18	27.261,28	13.124,18	18.752,24	25.379,98	21.830,94	24.334,64	6.617,69	759,81
1987	16.977,72	18.257,80	19.929,11	28.128,58	13.965,45	19.741,19	25.953,76	22.408,43	25.005,64	6.696,39	812,26
1988	18.251,19	18.971,64	21.058,77	29.294,24	15.026,95	20.702,92	26.983,19	23.322,67	25.964,12	6.620,26	874,35
1989	19.422,82	19.590,07	22.371,58	30.264,13	16.018,13	21.668,26	27.970,49	24.110,95	26.743,85	6.562,52	910,89
1990	20.421,15	19.383,93	24.245,21	30.839,28	16.687,27	22.464,73	28.839,91	24.747,33	27.336,82	6.460,60	944,89
1991	20.046,47	19.746,38	24.571,38	31.292,05	17.456,39	22.978,13	29.458,89	25.019,78	27.455,96	6.557,28	1.004,59
1992	21.355,08	19.733,29	25.220,21	31.531,69	17.660,30	23.078,34	29.730,68	25.207,75	27.764,32	6.579,61	1.097,27
1993	20.991,48	19.303,67	25.770,16	31.243,68	17.278,30	22.722,15	29.416,60	25.092,37	27.860,40	6.701,30	1.200,71
1994	21.774,92	19.591,40	27.146,23	31.909,24	17.398,13	23.153,17	30.058,32	25.741,38	28.488,87	6.887,82	1.311,41
1995	23.194,51	19.909,53	29.609,41	32.829,88	18.080,55	23.686,84	30.724,79	26.378,46	29.029,40	6.854,45	1.421,02
1996	23.112,75	20.389,32	31.635,55	33.242,85	18.642,54	24.219,33	31.173,14	26.854,90	29.695,78	6.971,18	1.529,32
1997	23.389,24	21.198,79	34.733,09	33.835,07	19.380,98	25.007,89	31.945,99	27.599,05	30.498,61	7.203,49	1.617,47
1998	24.516,08	21.902,74	37.352,48	34.371,98	20.207,28	25.977,00	32.830,96	28.390,52	31.139,39	7.232,91	1.627,19
1999	25.454,95	22.489,32	40.820,82	34.902,26	20.874,58	27.032,22	33.725,68	29.192,29	31.928,05	7.121,84	1.708,53
2000	26.688,03	23.275,44	44.089,25	36.180,78	21.513,46	28.335,00	34.915,18	30.268,98	32.981,16	7.282,57	1.818,73
2001	27.445,46	24.111,42	45.700,96	36.801,29	21.777,41	29.264,88	35.537,34	30.901,01	33.204,32	7.227,64	1.922,75
2002	28.142,86	24.965,59	47.601,18	36.837,86	21.824,98	29.685,36	35.728,13	31.245,04	33.479,76	7.140,90	2.055,63
2003	28.532,25	26.349,28	48.215,71	36.729,98	21.540,07	30.082,63	35.787,79	31.529,47	33.901,23	7.147,22	2.216,33
2004	29.568,20	27.614,41	50.452,94	37.070,33	21.877,91	30.504,36	36.420,90	32.215,90	34.733,91	7.495,75	2.394,96
2005	30.559,85	27.698,51	52.163,64	37.238,94	22.004,80	31.110,01	36.850,92	32.769,87	35.444,83	7.719,76	2.606,80
2006	31.470,92	29.176,39	53.337,50	37.872,17	22.306,28	31.865,37	37.868,11	33.745,93	36.249,98	8.032,62	2.865,53
2007	32.378,57	30.054,89	54.568,67	38.236,80	22.817,32	32.459,92	38.830,99	34.665,40	36.906,83	8.386,67	3.190,39
2008	32.727,14	29.874,74	51.112,00	37.585,34	22.829,85	32.303,24	38.824,93	34.719,98	36.719,77	8.621,90	3.434,36
2009	31.218,21	28.514,81	48.054,47	35.363,40	22.128,85	30.874,13	36.956,38	33.112,40	35.197,01	8.357,87	3.672,16
2010	30.818,48	26.917,76	48.711,95	35.849,37	22.538,65	30.736,63	37.635,93	33.729,21	35.981,44	8.760,30	4.002,60
2011	30.163,31	24.495,71	50.304,68	35.994,13	22.159,48	30.321,70	38.334,69	34.341,25	36.451,32	9.042,39	4.310,69
2012	28.852,20	22.830,53	50.183,46	34.885,30	21.353,23	29.414,86	37.922,13	34.131,27	36.690,55	9.182,46	4.601,02
2013	27.242,23	22.251,26	50.587,30	33.887,30	21.228,09	29.008,02	37.700,09	34.117,66	36.996,93	9.329,89	4.896,66
2014	27.182,50	22.565,68	54.638,38	33.615,97	21.533,49	29.496,38	38.097,15	34.617,39	37.510,79	9.320,01	5.189,73
2015	27.874,16	22.615,39	67.719,16	33.959,29	22.016,84	30.595,16	38.780,33	35.324,81	38.174,05	9.217,65	5.487,99
2016	29.081,82	22.666,29	70.298,66	34.397,65	22.511,73	31.539,51	39.403,19	35.935,05	38.589,39	9.081,33	5.795,08
2017	30.100,16	23.052,99	74.559,33	35.029,43	23.197,44	32.402,68	40.289,73	36.757,11	39.295,09	9.149,16	6.125,30
2018	30.926,45	23.558,08	78.764,63	35.391,71	23.737,66	33.146,39	40.978,86	37.416,99	39.936,60	9.190,80	6.470,43

Table 4.2: Gross Domestic Product per capita of Greece, Ireland, Italy, Portugal, Spain, Eurozone, European Union, OECD Economies, Latin America & Caribbean and East Asia & Pacific during 1970 - 2018

The Table 4.3 and the Table 4.4 represent the descriptive statistics of the GDP per capita table above:

	CYP	GRC	IRL	ITA	PRT	ESP	EUROZONE	EU	OECD (TOTAL)	LATIN AMERICA & CARIBBEAN	EAST ASIA & PACIFIC
Mean	22490.10	21208.68	34314.73	30171.38	17233.86	23892.04	30143.87	26432.86	28750.43	7176.669	1998.544
Median	23291.88	19746.38	27146.23	31909.24	17660.30	23153.17	30058.32	25741.38	28488.87	6860.476	1311.415
Maximum	32727.14	30054.89	78764.63	38236.80	23737.66	33146.39	40978.86	37416.99	39936.60	9329.894	6470.432
Minimum	7353.174	13392.31	12708.77	17653.02	8770.311	13542.96	17519.96	15318.94	17034.30	4784.863	357.7013
Std. Dev.	7422.453	4067.741	18518.46	6314.670	4798.289	6220.774	7162.952	6759.043	7029.210	1207.734	1781.211
Skewness	-0.395863	0.514922	0.614266	-0.570301	-0.246253	-0.027033	-0.155838	-0.004683	-0.074117	0.359484	1.107246
Kurtosis	1.875223	2.615342	2.285564	1.974716	1.488101	1.494694	1.633701	1.606964	1.632640	2.366676	2.998614
Jarque-Bera	3.468577	2.467440	4.123578	4.802371	5.162153	4.632277	4.009660	3.962133	3.862110	1.874280	10.01229
Probability	0.176526	0.291207	0.127226	0.090610	0.075692	0.098654	0.134683	0.137922	0.144995	0.391747	0.006697
Sum	989564.6	1039225.	1681422.	1478398.	844459.3	1170710.	1477050.	1295210.	1408771.	351656.8	97928.67
Sum Sq. Dev.	2.37E+09	7.94E+08	1.65E+10	1.91E+09	1.11E+09	1.86E+09	2.46E+09	2.19E+09	2.37E+09	70013817	1.52E+08
Observations	44	49	49	49	49	49	49	49	49	49	49

Table 4.3: Descriptive statistics as individual for each country and for each group of countries individually

	CYP	GRC	IRL	ITA	PRT	ESP	EUROZONE	EU	OECD (TOTAL)	LATIN AMERICA & CARIBBEAN	EAST ASIA & PACIFIC
Mean	22490.10	21886.22	36673.11	31459.35	18035.85	24898.61	31415.96	27561.42	29948.65	7393.137	2181.897
Median	23291.88	20794.05	33184.32	33429.41	19011.76	24613.61	31559.57	27226.97	30097.20	7046.509	1573.394
Maximum	32727.14	30054.89	78764.63	38236.80	23737.66	33146.39	40978.86	37416.99	39936.60	9329.894	6470.432
Minimum	7353.174	16634.47	14958.80	20020.92	10373.80	16590.88	20150.75	17398.41	18985.46	5908.755	429.6162
Std. Dev.	7422.453	3700.133	18082.80	5266.427	4374.246	5733.932	6396.216	6175.353	6377.489	1068.734	1790.103
Skewness	-0.395863	0.758509	0.517567	-0.650758	-0.401931	-0.120603	-0.208237	-0.067027	-0.145753	0.698396	0.993344
Kurtosis	1.875223	2.489612	2.227416	2.146609	1.595978	1.463992	1.619865	1.590430	1.664151	2.017965	2.734256
Jarque-Bera	3.468577	4.696710	3.058714	4.440733	4.798699	4.432085	3.810076	3.675572	3.427361	5.344938	7.365508
Probability	0.176526	0.095526	0.216675	0.108569	0.090777	0.109040	0.148817	0.159169	0.180201	0.069081	0.025154
Sum	989564.6	962993.8	1613617.	1384211.	793577.4	1095539.	1382302.	1212702.	1317741.	325298.0	96003.48
Sum Sq. Dev.	2.37E+09	5.89E+08	1.41E+10	1.19E+09	8.23E+08	1.41E+09	1.76E+09	1.64E+09	1.75E+09	49114248	1.38E+08
Observations	44	44	44	44	44	44	44	44	44	44	44

Table 4.4: Descriptive statistics as common for all the data from 1975 to 2018

4.3 Comparison of productivity among EU and world economy

GDP per capita is the income attributable to each resident of a country and can be roughly considered a way of measuring productivity as it is the income generated by the average resident. However, in the next chapter we will look at more precise productivity indicators such as GDP per hour worked and GDP per person employed.

The Figure 4.1 shows the GDP per capita of the largest Eurozone countries hit by the sovereign debt crisis, which are: Cyprus, Greece, Ireland, Italy, Portugal and Spain. The period of the survey is from 1970 to 2018. Cyprus' data start from 1975. GDP is measured in nominal terms and is expressed in dollars of 2010. In addition, it is adjusted on the basis of purchasing power parity (PPP) to eliminate differences in price levels of the same commodity between different countries.

In 1970 Greece's GDP per capita was higher than that of Ireland, Portugal and Spain. From 1975 Greece is ahead of Cyprus, but in 1989 Cyprus reaches Greece's GDP and from that year until 2018 surpasses it. In the 1980s, however, Greece experienced a period of relative stagnation and as a result Portugal managed almost to reach the Greek GDP. However, in 2016, 2017 and 2018 Greece and Portugal have the same GDP per capita. The GDP of Italy and Spain moving together. In 1997, Ireland and Italy had the same level of GDP , but from 1998 Ireland begun to has an extremely good performance.

According to D. Vagianos et al. in 1970 Greece's GDP per capita was higher than that of Ireland, Portugal and Spain, while in the 1980s Ireland and Spain managed to surpass Greece in terms of GDP per capita. Their survey examine the GDP per capita of German, Greece, Ireland, Italy, Portugal and Spain during 1970 – 2014. Gross Domestic product is measured in US dollars of 2014 and it is adjusted according to the PPP of 2011. The data have been extracted from The Conference Board Total Economy' s (TED) database.

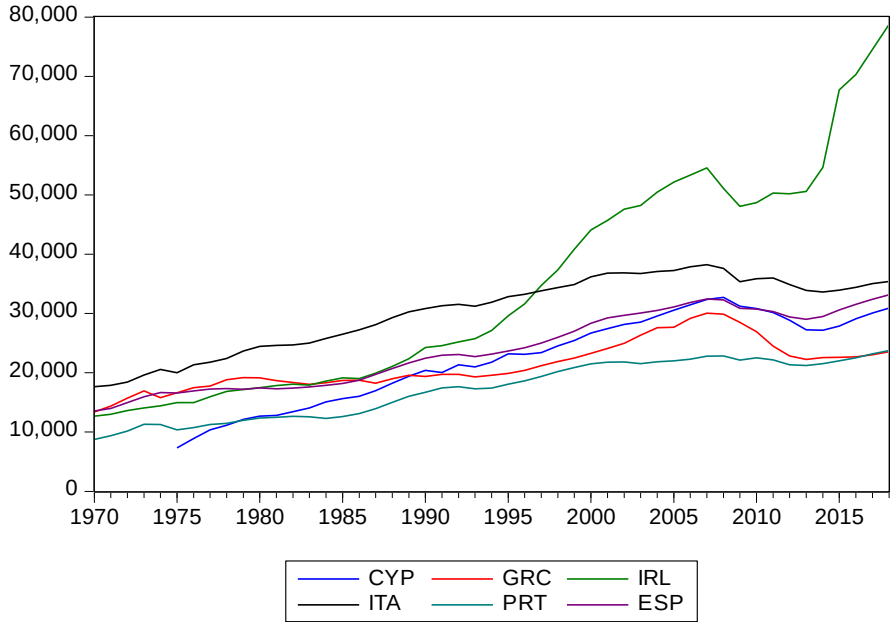

Figure 4.1: Gross Domestic Product per capita of Cyprus, Greece, Ireland, Italy, Portugal and Spain during 1970 – 2018

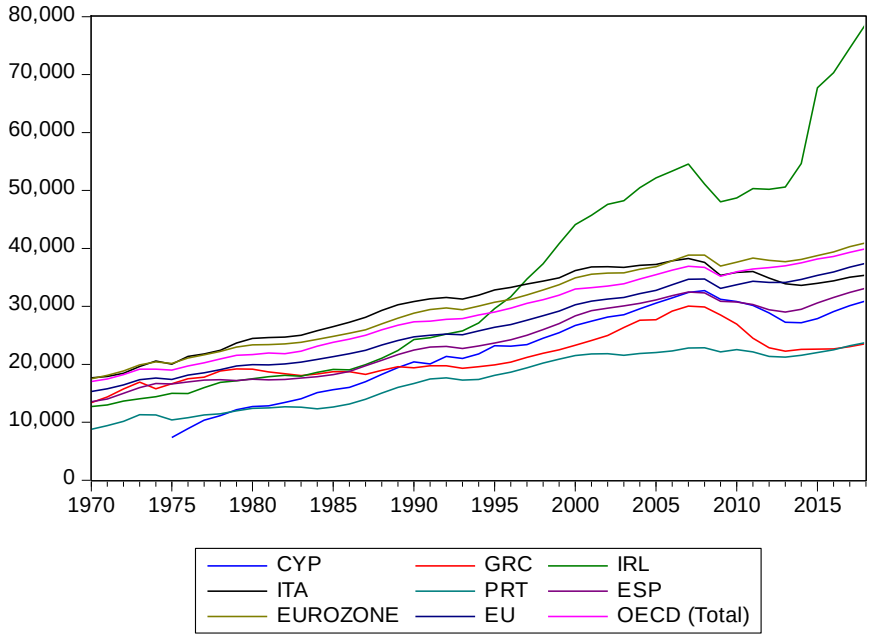

Figure 4.2: Gross Domestic Product per capita of Cyprus, Greece, Ireland, Italy, Portugal, Spain, Eurozone, EU and OECD

The Figure 4.2 above shows that the Gross domestic Product per capita of Ireland is notably higher than the GDP of Cyprus, Greece, Italy, Portugal and Spain from 1997 until 2018. Also, we can see that the GDP per capita of the Eurozone, the EU and the OECD countries are moving together. Furthermore, we observe that Italy and Ireland are above the GDP curve of the Eurozone, while Cyprus, Greece, Portugal and Spain are below the Eurozone' s GDP curve.

Observing the graphs of Figure 4.3, we can see that the GDP per capita of both Latin America & Caribbean and East Asia & Pacific is below of all the GDP curves of the graph. Cyprus, Italy, Spain, the Euro area, the European union and the OECD countries tend to move together. On the other hand, Greece and Portugal try to follow the movement of the previous countries.

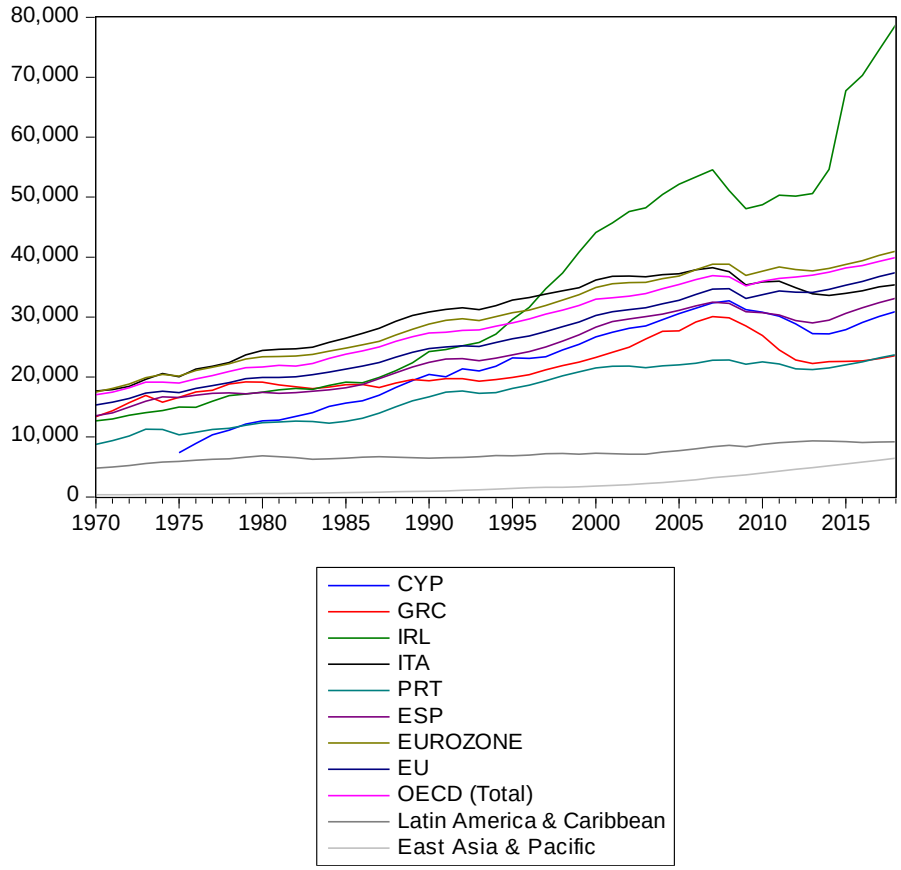

Figure 4.3: Gross Domestic Product per capita of Cyprus, Greece, Ireland, Italy, Portugal, Spain, Eurozone, EU, OECD Economies, Latin America & Caribbean and East Asia & Pacific

4.4 Data & Descriptive statistics of GDP per hour worked

Productivity measures the efficiency with which production inputs, such as labor and capital, are being used in an economy to produce a given level of output, and is considered a key source of economic growth and competitiveness. One of the most widely used measures of productivity is labor productivity (LP). LP growth implies a higher level of output per unit of labor input. This can be achieved if more capital is used in production, i.e. capital deepening (CD), or through improved overall efficiency with which labor and capital are used together, i.e. higher multifactor productivity growth (MFP). Capital deepening reflects investment in physical and intangible capital (so-called knowledge-based capital), and is defined as the ratio of capital services per hour worked. Investment in information and communication technologies (ICT) that enables new technologies to enter the production process is thought to be especially productivity-enhancing.

Gross domestic product (GDP) is a measure for the economic activity. It is defined as the value of all goods and services produced less the value of any goods or services used in their creation. GDP per person employed is intended to give an overall impression of the productivity of national economies expressed in relation to the European Union (EU28) average, but we should note that "person employed" does not distinguish between full-time and part-time employment. On the other hand, labor productivity per hour worked is calculated as real output per unit of labor input (measured by the total number of hours worked). Measuring labor productivity per hour worked provides a better picture of productivity developments in the economy than labor productivity per person employed, as it eliminates differences in the full time/part time composition of the workforce across countries and years (OECD & WB definition).

The table below show GDP per hour worked, which is a measure of a country's productivity. The period of our analysis is 49 years, i.e. from 1970 to 2018. The data have extracted from the OECD (Organization for Economic Co-operation and Development) and they are measured in US dollars and in constant prices (2010 PPPs). Our survey includes the following countries and group of countries: Greece, Ireland, Italy, Portugal, Spain, Eurozone, European Union and OECD. There are no available data for Cyprus.

Year	GRC	IRL	ITA	PRT	ESP	EUROZONE	EU	OECD (TOTAL)
1970	..	13,2	22,7	14,4	17,7	..	..	..
1971	..	13,6	23,7	15,1	18,4	..	..	..
1972	..	14,7	24,9	16,5	19,9	..	..	..
1973	..	15,3	26,5	18,6	21,1	..	..	..
1974	..	16,0	28,0	17,7	22,1	..	..	..
1975	..	17,1	27,6	16,3	22,5	..	..	..
1976	..	17,5	29,3	17,3	23,3	..	..	..
1977	..	18,6	30,5	18,3	24,2	..	..	..
1978	..	19,9	31,6	18,9	25,4	..	..	..
1979	..	19,8	33,2	19,9	26,4	..	..	..
1980	..	20,9	33,9	20,4	28,0	..	..	..
1981	..	22,0	34,1	20,8	29,2	..	..	..
1982	..	22,7	33,9	21,4	30,1	..	..	..
1983	23,4	22,9	34,2	20,5	31,3	..	..	..
1984	24,8	24,6	35,5	20,3	33,4	..	..	..
1985	24,5	25,4	36,2	21,1	34,7	..	..	..
1986	24,7	25,0	36,9	22,1	35,2	..	..	..
1987	24,7	26,3	37,6	22,7	35,6	..	..	..
1988	25,5	27,5	38,6	23,8	36,2	..	..	..
1989	25,8	29,1	40,0	24,5	36,9	..	..	..
1990	25,8	30,4	40,4	25,0	36,9	..	..	..
1991	26,6	31,6	40,4	26,4	37,2	..	..	..
1992	26,1	33,2	41,0	27,3	38,2	..	..	..
1993	25,2	34,0	41,8	27,3	39,1	..	..	..
1994	25,7	34,9	43,5	27,4	40,3	..	..	..
1995	26,2	36,6	44,8	27,9	40,6	42,4	35,8	..
1996	27,1	38,0	44,9	28,4	41,1	42,9	36,3	..
1997	28,5	40,6	45,7	29,0	41,0	43,7	37,1	..
1998	28,3	41,4	45,6	29,3	40,8	44,2	37,7	..
1999	29,2	43,2	45,9	29,9	40,6	44,8	38,6	..
2000	30,2	45,5	47,2	30,2	40,8	45,9	39,8	39,2
2001	31,5	46,7	47,5	30,5	40,8	46,6	40,6	39,9
2002	32,1	49,2	47,1	30,8	40,9	47,0	41,5	40,5
2003	33,5	50,2	46,7	30,9	41,1	47,3	42,0	41,5
2004	34,5	52,1	47,2	31,6	41,2	47,8	42,7	42,4
2005	33,5	52,3	47,5	31,9	41,3	48,3	43,2	43,1
2006	35,0	52,6	47,5	32,5	41,6	49,0	43,9	43,7
2007	35,9	53,5	47,4	33,0	42,1	49,5	44,4	44,4
2008	35,4	52,0	47,1	33,2	42,2	49,3	44,2	44,4
2009	34,4	54,5	46,1	33,1	43,3	48,8	43,6	44,6
2010	34,4	60,9	47,1	34,2	44,3	50,1	45,0	45,3
2011	33,3	61,9	47,4	34,6	44,9	50,9	45,6	45,7
2012	32,7	62,4	47,2	35,0	45,8	51,3	46,0	46,0
2013	32,4	61,2	47,7	35,4	46,4	51,8	46,5	46,5
2014	33,0	64,2	47,7	35,1	46,6	52,3	46,8	46,8
2015	32,4	77,0	47,9	35,1	46,8	52,7	47,4	47,3
2016	32,2	77,3	47,6	35,1	47,0	53,0	47,7	47,5
2017	32,0	80,6	48,0	34,9	47,5	53,5	48,2	48,2
2018	32,0	84,0	47,9	34,9	47,4	53,6	48,6	47,9

Table 4.5: Gross Domestic Product per hour worked of Greece, Ireland, Italy, Portugal, Spain, Eurozone, EU and OECD

The Table 4.6 that follows present the descriptive statistics of the data of the Table 4.5:

	GRC	IRL	ITA	PRT	ESP	EUROZONE	EU	OECD (TOTAL)
Mean	29.79214	39.06768	40.26627	26.53442	36.31226	48.61399	43.05104	44.45597
Median	30.86460	34.85051	43.52053	27.44555	40.25856	48.91448	43.77652	44.56059
Maximum	35.86736	83.96879	47.96535	35.40669	47.54961	53.60900	48.55721	48.15274
Minimum	23.41114	13.15631	22.72181	14.35455	17.66240	42.41021	35.77478	39.17282
Std. Dev.	3.915902	19.50467	7.875104	6.585460	8.670704	3.422802	3.905389	2.760103
Skewness	-0.092075	0.572185	-0.726282	-0.218606	-0.708890	-0.227803	-0.425921	-0.473529
Kurtosis	1.479601	2.372255	2.211820	1.688165	2.325721	1.977266	2.047484	2.112806
Jarque-Bera	3.518288	3.478274	5.576133	3.903800	5.032202	1.253561	1.632920	1.333190
Probability	0.172192	0.175672	0.061540	0.142004	0.080774	0.534309	0.441994	0.513454
Sum	1072.517	1914.316	1973.047	1300.186	1779.301	1166.736	1033.225	844.6635
Sum Sq. Dev.	536.7001	18260.75	2976.828	2081.678	3608.693	269.4581	350.7975	137.1270
Observations	36	49	49	49	49	24	24	19

Table 4.6: Descriptive statistics individually for each country or group of countries from the table 4.1

4.5 Empirical Results from relevant literature

At the Figure 4.4 we observe that the Greek as well as the Portuguese Gross Domestic Product per hour worked are roughly the same. The GDP per hour worked of Italy and Spain indicate a slight decline in 2001 and stagnation thereafter, while the Irish GDP per hour worked notes a remarkable rise over the period 2001 – 2018 with certain declines in 2008 and 2013. OECD countries and European Union have almost the same GDP per hour worked levels, while the GDP per hour worked of the Eurozone countries is higher than that of Greece, Italy, Portugal and Spain.

According to the existing literature, there is a large amount of evidence that human capital and, therefore, TFP (particularly education, technology and Institutions) have significant impact on economic growth and productivity. Studies supporting the previous sentence are from M. Kabir Hassan et al. (2011), J. E. Ligthart (2011), C. Tsamadias (2011), N. Leounakis et al. (2014), P. Pegkas (2014), M. Galenianos (2015), M. Popescu et al. (2015), Y. M. Ioannides et al. (2016), Y. E. Kim et al. (2017) and D. Vagianos et al. (2017).

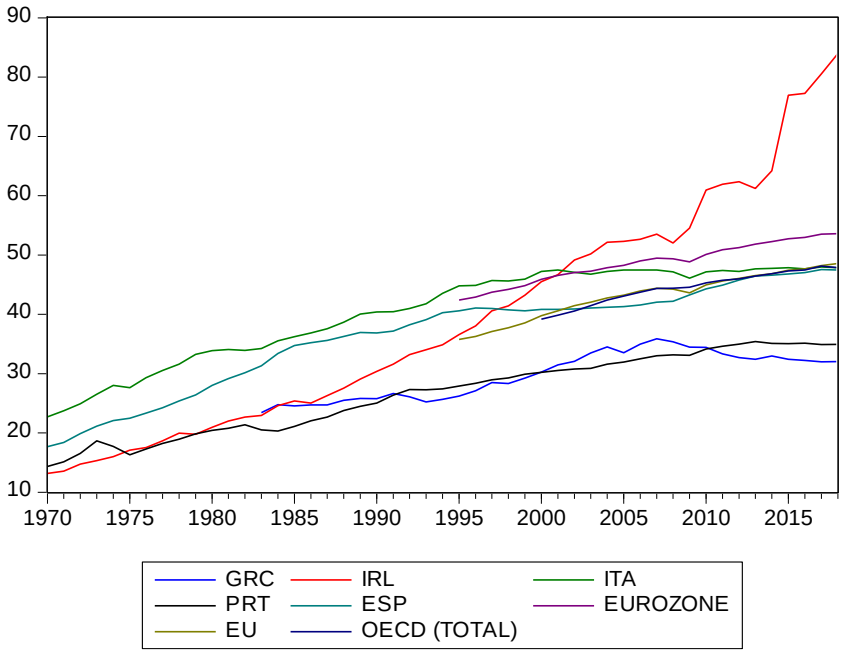

Figure 4.4: GDP per hour worked of Greece, Ireland, Italy, Portugal, Spain, Eurozone, EU and OECD for the period 1970 – 2018

Chapter 5: INSTITUTIONS, ECONOMIC DEVELOPMENT AND GROWTH

5.1 Introduction

In this chapter we briefly review the theories that have been developed and have tried to explain the phenomenon of the development and its inherent concept of growth and Institutions. Institutions are those who try to explain how the economy works and sometimes defined as "the rules of the game" and some other times as habits. Many researchers have shown that the Institutions are capable either of promoting the development process or of discouraging them.

The concept of growth engaged in the effort to create a more massive and productive economy, which is reflected in GDP growth rate, but ignores the concern to solve social problems such as social inequalities. On the other hand, development concerns the attempt to create an efficient and productive economy that focuses on citizens' needs by increasing their incomes in order to improve their standard of living and create the right conditions for a better life. Then, we analyze theories related to Institutions, development and growth which support that Institutions promote the development process.

In this chapter we will analyze all those Institutions that can make an economy to follow the path of growth, we will study why some countries are developing while others not, and we will also consider the Institutions that are important for econometric perspective and we will point out the problems that this perspective has.

In addition, we will examine how political Institutions relate to economic development. By political Institutions we mean mainly political organizations that create and enforce laws, are involved in policy-making and provide representation for the population as a whole. Particularly, we will analyze how these Institutions can promote economic development through the existence of financial development, the strengthening of democracy and property rights, the transparency of trade and the political system.

5.2 Institutions and Governance

Douglass C. North (1991) in his paper “Institutions” note that the Institutions are the humanly devised constrains that structure political, economic and social interaction and they consist of both informal constraints such as customs, traditions, taboos, sanctions, and codes of conduct and formal rules such as laws, property rights and constitutions. In other words, Institutions provide the incentive structure of the economy and as this structure evolves the economy is led towards growth, stagnation or decline.

On the other hand, there is a variety of authors, organizations, policymakers and scholars, who give a wide array of definitions for the definition of governance or institutional quality. More subtly, some well-known governance’s definitions are the following. To begin with, according the World Bank's 2002 World Development Report "Building Institutions for Markets", governance is defined according to rules, state enforcement mechanisms (inspections and sanctions) and organizations of a country. Secondly, a previous definition of governance proposed by the World Bank (1992) in its publication “Governance and Development” is that the governance focuses on public sector management issues as long as also represents the manner in which power is exercised in the management of a country's economic and social resources for development.

Composing the governance definitions that we outline above, we can conclude that the governance constitute the country's authority which exercise its traditions and Institutions. In specific, this includes firstly the process by which governments are selected, monitored and replaced, secondly the capacity of the government to effectively formulate and implement sound policies and last but not least, the respect of citizens and the state for the Institutions that govern economic and social interactions among them. In the three areas indicated above corresponds two dimensions of governance as the World Bank has proposed (World Bank, 2009; D. Kaufmann et al., 2010):

(a) The process by which governments are selected, monitored, and replaced:

1. Voice and Accountability (VA): capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.

2. Political Stability and Absence of Violence/Terrorism (PV): capturing perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.

(b) The capacity of the government to effectively formulate and implement sound policies:

3. Government Effectiveness (GE): capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

4. Regulatory Quality (RQ): capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

(c) The respect of citizens and the state for the institutions that govern economic and social interactions among them:

5. Rule of Law (RL): capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

6. Control of Corruption (CC): capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

5.3 Institutional Theory Review

Various theories examine the effects of Institutions on economic activity. Initially, the Marxists have developed an endogenous theory of Institutions in which they report how people at some point in their lives are entering the productive process and developing productive relationships. The same production relationships run counter to the property relations existing at labor. Marxists believe that this opposition will lead to a period of social revolution. For them, the structure of society contains property relations and Institutional changes relate to changes in productive relations (usually referring to technological changes) that correct the class struggle through creation of Institutions. Marxists usually consider production relations as Institutional barriers to economic growth, as they lead to incomplete markets and informational distortions. They develop this theory by examining in essence, a pre-capitalist rural economy.

5.4 Theories related to economic development and growth

Over time until the present day, economists are trying to answer the questions "why some countries are poor and some are rich," "how to explain the success of economic growth and how people learn from its failures", "why there are inequalities in the world". Economic development is related with anthropocentrism, as it is important for both the conditions it creates as it affects the environment of economic activity, labor relations and production conditions, and the outcomes attached to it. It is important to mention that the concept of economic development, which is defined as the process of higher per capita income, meets the basic needs of people and increases living standards is distinguished from the concept of economic growth, which is defined as the formation of a more massive economy, i.e. there is more production and export of products. Additionally, growth is not concerned with issues such as social inequalities (R. Peet & E. Hartwick, 2015). Then, once we have clarified the concepts of development and growth, it is important to point out that development is a

concept wider than growth and is distinct from it, as it is based on three fundamental values which are: (a) the maintenance of life, i.e. each person must be able to meet his or her basic needs and improve his or her standard of living, (b) self-respect and (c) freedom from coercions (free will).

A related concept of growth is that of convergence, that is, the phenomenon where poorer countries are growing faster than the richer ones, approaching the level of growth of the latter. The main reason that makes countries differ is their technological differences, which indicates that countries can instead converge, deviate either from rates of development or growth. Several economists have tried to answer the questions raised above. The result of these efforts is to create theories in terms of economic development and growth. Regarding the economic development, some of the theories that have been developed are:

The Classical approach: The Classical approach considers that the economy is moving from a stage of development to a stagnation stage, limited by limits that cannot be exceeded. It points out that the overall product depends on the size of the labor force (manpower), the stock of capital, the amount of available land and the level of technology. This theoretical approach is not verified by examples of developed countries, where we observe an increase in labor productivity due to technological progress, accumulation of human capital, continuous improvement of the quality of the workforce and discovery of new resources (L. Tsoulfidis, 2018).

Marx: Marx has the same point of view with the Classical School in terms of the fact that the population lives at a level of simple survival. The difference of Marxism with respect to Classical Thought is that long term the economy reaches a state of stagnation. Marxists therefore argue that capitalism will eventually collapse and socialism will take its place. In capitalist societies, surplus is defined as the value the worker produces, but the capitalist exploits it (J. Elster, 1985).

Schumpeter: Schumpeter (1954) also considers that in the future there will be a collapse of the capitalist system, but unlike Marx, he underlines that the successes of capitalism are the reasons which lead the economy initially at a state of stagnation and, in the future, the fall of capitalism. He considers the developer not necessarily the owner of the business but the innovative entrepreneur, that is, one who sees profits in an activity, has the know-how to enter new markets and creates new products and discovers new sources of raw materials. Every innovative entrepreneur, in order to contribute to economic development, must make significant profits and make investments. Also, it is worth mentioning that the financing of these investments is made through money circulation (i.e. through borrowing) rather than through savings. When the investment activities begin, then innovative entrepreneurs begin to repay the loan. The profits of these entrepreneurs increase competition and allow other innovative entrepreneurs to enter the market, which creates reductions in the profits of market-makers who have already begun to repay the loan, thus reducing their investment, and so the economy sinks into recession, and is disturbed by economic fluctuations. Schumpeter also considers

that more resources are available in long term and increases in this way the educational level of people, creating a social environment that does not require dynamic entrepreneurs but salaried employees. Thus, innovative entrepreneurs are diminishing considerably, investment is decreasing, and the system of capitalism is collapsing.

Rostow: Rostow's economic development theory, which states that a country to pursue a development path goes through a number of stages: (1) the traditional economy, (2) the conditions for take-off, (3) the take-off, (4) maturity and (5) massive consumption. In other words, Rostow states that an economy develops from the primary sector to the secondary and then to the tertiary sector of production in a deterministic way (S. Sanderson, 2000).

In terms of growth, theories developed are the following (R. Peet & E. Hartwick 2015):

Smith's capital accumulation and division of labor theory (1776): Smith's capital accumulation and division of labor theory, which refers to endogenous growth, which is in other words a mechanism that improves the skills and the productivity of workers and manages to save the time that is lost as workers pass through one production stage in the other. It focuses on the effect of capital accumulation on labor productivity and distinguishes work into work that depends on the size of the market and on work that depends on the capital accumulation. It reports the overall profit level, which at micro level operates at constant yields while at macro level and for total production it shows increasing yields. In his analysis, Smith introduces technological advance and sets limits on growth. These limits are the insufficient supply of workers, the inadequacy of nature and the erosion of incentives to accumulate capital, which as a process opens up new markets or expands existing ones, increasing the high demand, which as a result is the leading cause of growth. In particular, Smith suggests that the scarcity of resources restricts people's productive activity and thus growth, ignoring the fact that growth may end at some point due to the shortage of labor supply and the reduction in capital accumulation. The theory concludes that the workforce is growing as the accumulation of capital increases, confirming the fact that faster capital accumulation leads to higher real wages. In addition, the rate of economic growth depends on the decisions of the stakeholders on their savings and investment choices but also on the innovation encountered in socio-economic and institutional arrangements. It also considers that it depends on endogenous new knowledge which as a good tends to be transformed into a public good in which the principles of non-competitiveness and non-exclusivity apply.

Marshall (1890) – "fixed immobility": Marshall introduced the concept of "fixed immobility", which assumes that the population is stationary or that wealth increases at the same rate, without the scarcity of land and providing methods of production and changing conditions of trade in quantity of the human factor to be kept constant. At a situation of stagnation, the conditions of production, consumption, trade and distribution will be maintained in the same quantity and in equal relations with each other, regardless of the fact that they increase in volume. As a result, the economic system is

growing at a steady rate equal to the exogenous rate of population growth, and the distribution of income and the relative prices are the same in the stable economy.

Cassel (1924) - Theory of Social Economics: Cassel's Theory of Social Economics presents the model of exogenous growth that can be considered as the beginning of the Neoclassical Theory of Growth.

5.5 Factors that determine and suppress development and growth

According to the economic theory, one factor that leads to development is exports. This development policy may be more effective if implemented by a limited number of countries, but it will likely provoke distortions if development policy attempted by many countries at the same time, as the international markets will not be able to absorb all these exports. These exports also consequently will not be able to contribute to improve the economical development. Thus, export based development can improve a country's economic growth rates by achieving equal distribution of income through emphasis on exports which are sensitive at labor, but failing to implement or more difficult to implement in countries where protection policy is exercised. By the term protection policy we mean the policy that protects domestic products from international competition whilst simultaneously reinforcing their preference by the national consumer. Additionally, according to the economic theory, development and growth result from an increase in the productive capacity of the economy, where the positive shift in the production function in which the product is a function of the quantity of capital, of labor, of land, and it is also a function of technological level, of the market size and of the institutional framework. Therefore, the factors that determine development and growth are:

The institutional framework: Institutions formulate rules of conduct and affect the country's development level, affecting the rates of economical development due to the formation of an environment that combines the factors of production reported as a function of the product.

Market size: As market size increases, aggregate demand increases, generating incentives to increase profits through increased production, increasing the offer of saving funds and thus investment, leading to economical growth.

Entrepreneurship: Entrepreneurship increases when the rate of increase in per capita income increases.

The rise of the technological level: The technological level rises through the inventions and the innovations.

Capital: Increasing capital leads to increased productivity, which increases investment, increases savings for further investment and increased productivity, leading to economic growth which is not only achieved through the accumulation of capital but also through the using of other factors of production.

Human resources: Human resources affect the economy through population size, Malthusian population theory, and through the quality and size of the workforce. The Classical School about population size argued that the tendency to increase population reduced the actual standard of living to the minimum subsistence level. The standard of living is defined as the ratio of GDP per capita to the ratio of total real GDP to population size. That is: GDP= Y / Π (Living standard). Economical development and improvement of living standards occur when the growth rate of the total real Gross Domestic Product Y is greater than the growth rate of the population Π. As for the Malthusian population theory, it refers to the fact that population growth is the result of the economic process and causes stagnation in the economy. In other words, Malthus believes that the population is growing exponentially (geometric rate), while food at an algebraic rate, which means that at some point the population will grow so that the food will not be sufficient to feed it (Malthus, 1826). Finally, the size and quality of a country's workforce capable of working depends on its health and education.

Natural resources: Natural resources are the soil with its components and the climatic conditions. It makes sense that some countries are rich in natural resources and some others are not. However, the importance of a country not only depends on the availability of natural resources, but also on the way they are used, the organizational and technical capabilities of their managers and the demand for them.

In addition, both development and growth are achieved through better implementation of laws, lower government consumption, increase political rights in the context of democracy , extension of living standards, admission to secondary and tertiary education, improvement of trade and reduction of inflation. All of the above factors are convergence factors between countries. Other factors which lead to development and growth are also public pension policies, labor market regulations, infrastructure investments, investment in research and development (R&D) and quality of education, and as well as wealth and distribution policies.

On the other hand, development and growth inhibiting factors are the following three (Th. Pelagidis & M. Mitsopoulos, 2006):

1. Market imperfections such as price rigidity, lack of mobility of qualification factors and ignorance of market conditions.
2. The vicious cycle of poverty, where a range of factors push the country to become trapped in a constant state of poverty. For example, a country with a low income level has low purchasing power and low savings potential. Therefore, it will make low-level investments, with a low capital

accumulation rate that leads to low labor productivity and low real income, creating a recurring perpetual situation.

3. The dissemination of knowledge and modern communication makes individuals strive to take advantage of the high living standard.

5.6 From economic recession to economic development and growth

Research (L. Alston et al., 1996; World Bank, 2002; M. Shirley, 2008) has shown that weak and deficient Institutions are at the roots of the economic recession. Thus, in order to develop further, modern developing countries must develop market support Institutions in a competitive environment dominated by developed countries. However, for an economy to grow it needs an Institutional framework to support a market economy. This Institutional framework should include:

1. Institutions that facilitate the transactions by minimizing and encouraging the credibility of the business. These can be laws, commercial rules and regulations, habits and perceptions.
2. Institutions that affect the state and the citizens such as the Constitution, electoral rules, educational laws and government control rules (World Bank, 2002)

In many countries, inefficient Institutions are maintained or even strengthened, jeopardizing the economy and its potential development and growth. The school of New Institutional Economics states that the reasons for a country's development or recession are due to its history, the political unrest, the culture and the beliefs of that country (Shirley 2008). For example, La Porta et al. (1998) claim that some countries created ineffective Institutions that impede development because they were adopted by their colonizers. Acemoglou et al. (2001) attribute the reasons of development or recession to local conditions, claiming that they were the result of significant natural resources that colonists exploited by introducing Institutions that were not aimed at developing the area but in exploiting it. Concerning political unrests the economic recession was due to the fact that countries with very low political competition allowed legislators to set up institutions to serve the interests of the powerful. Concerning culture and beliefs, North (1990) and Greif (1994) report that countries with an unfriendly culture to developing markets discourage the creation of favorable trade and investment Institutions and as a result causes recession. Econometric models that measure the influence of Institutions on economic development and growth use interpretive variables as: (a) protection of property rights, (b) cultural freedoms, (c) political rights, (d) democracy and (e) cooperative institutions including trust, religion and social networks, as well as negative variables indicating political instability, corruption, etc.. However, some of the interpretative variables may not actually be institutions but results, such as political stability and security of property rights or policies (trade barriers) or monetary policies. In addition, variables refer mainly to formal Institutions, while developing countries operate on informal

institutions. In particular, many variables are qualitative and are based on subjective estimates and therefore are biased. Finally, these variables are usually composite indicators, which are biased as they are constructed by Institutions.

Therefore, as a confirmation of the above, Jütting et al. (2007) studied the impact of Institutions on the management of natural resources for market development and addressed the problem that although these institutions were precisely defined, they were not clear or measurable. Accordingly, Rodrik et al. (2004) pointed out that it is difficult to identify Institutions to measure democracy. However, they have argued that democratic regimes are better or equally well developed than authoritarian regimes because of their high degree of transparency and accountability, where they make difficult the rent-seeking and provide a wide range of action options for the agents, "exit or voice", that forces the principles to provide credible institutions and qualitative policies. In the same context, it is emphasized the role of informal Institutions and emphasized that democratic states have customer-oriented leaderships in forming a client-electorate network that would ensure their re-election rather than the implementation of social benefits or the provision of public goods. At the same time, they point out that the lack of trust and credibility in democratic Institutions reduces the active participation of citizens and bureaucrats.

5.7 Data

The following table presents the Worldwide Governance Indicators (Control of Corruption, Government Effectiveness, Political Stability and absence of violence/terrorism, Regulatory Quality, Rule of Law and Voice & Accountability) at estimate of Greece, Italy, Portugal and Spain. The data have been extracted from World Bank's database over the period 2002 – 2018. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

	GRC					
Year	CC.EST	GE.EST	PV.EST	RQ.EST	RL.EST	VA.EST
2002	0,424131	0,824902	0,875026	0,986624	0,747603	1,048019
2003	0,388841	0,76127	0,479343	1,01993	0,818208	1,156674
2004	0,46496	0,805216	0,489637	0,845335	0,913304	1,191415
2005	0,358235	0,715305	0,506985	0,960757	0,794582	1,097569
2006	0,363786	0,636948	0,63219	0,858504	0,873663	0,965483
2007	0,267383	0,557945	0,524189	0,894708	0,872376	0,983874
2008	0,13356	0,585292	0,270059	0,880909	0,862213	0,928212
2009	0,06747	0,619487	-0,20774	0,836671	0,652815	0,891444
2010	-0,05778	0,556039	-0,12721	0,644664	0,630501	0,897718
2011	-0,09882	0,512198	-0,0987	0,496458	0,572887	0,820455
2012	-0,18922	0,3198	-0,21725	0,526942	0,426507	0,700791
2013	-0,04531	0,459203	-0,17134	0,633417	0,465022	0,687238
2014	-0,12239	0,398586	-0,14045	0,329338	0,3626	0,618757
2015	-0,07661	0,256199	-0,23025	0,409623	0,267152	0,651495
2016	-0,09211	0,226983	-0,1216	0,148387	0,107359	0,668463
2017	-0,13803	0,3137	-0,1256	0,2382	0,083951	0,708551
2018	-0,06603	0,338261	0,092586	0,295001	0,152974	0,857337

Table5.1: Worldwide Indicators at estimate for Greece during 2002 - 2018

Year	ITA					
	CC.EST	GE.EST	PV.EST	RQ.EST	RL.EST	VA.EST
2002	0,54683	0,80183	0,83893	0,944386	0,764043	1,038653
2003	0,512423	0,801552	0,432391	1,077558	0,715892	0,985717
2004	0,375703	0,647108	0,2703	1,094056	0,602101	1,177168
2005	0,410525	0,561838	0,490133	0,998329	0,518271	1,057029
2006	0,483805	0,364741	0,531828	0,977495	0,38762	1,064524
2007	0,336824	0,197626	0,447652	0,940547	0,478749	1,111907
2008	0,270141	0,279627	0,549201	0,974746	0,455116	1,032024
2009	0,199061	0,421652	0,348211	0,968479	0,40474	1,03418
2010	0,126923	0,44191	0,473924	0,896336	0,430329	0,962797
2011	0,181864	0,377541	0,501207	0,717733	0,466514	0,911824
2012	0,066175	0,42067	0,508218	0,749991	0,40332	0,916809
2013	0,051636	0,458484	0,495499	0,784714	0,402901	0,954217
2014	-0,02964	0,374144	0,458165	0,641883	0,377391	0,999263
2015	0,016269	0,44811	0,37592	0,728811	0,275058	1,0347
2016	0,084377	0,535082	0,369415	0,710592	0,329176	1,033944
2017	0,188857	0,50242	0,237152	0,704022	0,324649	1,05348
2018	0,235619	0,413884	0,311193	0,671495	0,246762	1,045518

Table5.2: Worldwide Indicators at estimate for Italy during 2002 - 2018

Year	PRT					
	CC.EST	GE.EST	PV.EST	RQ.EST	RL.EST	VA.EST
2002	1,255313	1,205846	1,438887	1,291456	1,336411	1,304545
2003	1,158951	1,166833	1,290926	1,255014	1,309731	1,40958
2004	1,143963	1,064095	0,970772	1,19687	1,24946	1,464911
2005	1,069998	1,056517	1,01761	1,280887	1,2349	1,430305
2006	1,016922	0,874538	0,952956	1,065522	0,98591	1,232662
2007	1,036281	0,900742	0,821819	1,08139	1,016893	1,231421
2008	1,070165	1,085485	0,988454	1,100412	1,020404	1,201864
2009	1,092931	1,156265	0,787634	0,991403	1,064921	1,128243
2010	1,090371	1,010235	0,717687	0,719822	1,056598	1,107203
2011	1,112964	0,947194	0,741739	0,62597	1,023857	1,107911
2012	0,960238	1,035028	0,775273	0,826946	1,065502	1,028528
2013	0,950478	1,230732	0,748763	0,804151	1,058802	1,066935
2014	0,947626	0,988591	0,806274	0,749973	1,137531	1,107446
2015	0,964716	1,220576	0,91784	0,956852	1,146607	1,1286
2016	0,92546	1,210145	0,974051	0,844399	1,097268	1,156905
2017	0,874077	1,332172	1,079428	0,908749	1,132147	1,20752
2018	0,84983	1,208909	1,140031	0,890031	1,140912	1,204607

Table5.3: Worldwide Indicators at estimate for Portugal during 2002 - 2018

Year	ESP					
	CC.EST	GE.EST	PV.EST	RQ.EST	RL.EST	VA.EST
2002	1,3561	1,84743	0,443884	1,374277	1,257137	1,274987
2003	1,393117	1,881454	-0,04497	1,336925	1,280947	1,270559
2004	1,35659	1,3527	-0,08805	1,316545	1,144683	1,323612
2005	1,336209	1,50673	0,195214	1,305955	1,127902	1,131404
2006	1,185721	0,837202	-0,15026	1,177149	1,131011	1,078725
2007	1,086643	0,993322	-0,27535	1,21499	1,168316	1,123087
2008	1,190226	0,920347	-0,38085	1,25476	1,193509	1,185326
2009	1,0622	0,945832	-0,47378	1,189271	1,162589	1,176973
2010	1,084354	0,994799	-0,31804	1,160325	1,188944	1,122543
2011	1,104124	1,027235	0,021105	1,065844	1,198052	1,085866
2012	1,128226	1,120682	-0,02952	0,952991	1,064827	1,064179
2013	0,903093	1,154523	0,012018	0,939044	1,020516	0,988871
2014	0,629842	1,159705	0,243122	0,750495	0,952644	0,993726
2015	0,583897	1,174266	0,251491	0,807637	0,901603	1,044759
2016	0,515592	1,116165	0,413188	1,008604	0,978849	1,040997
2017	0,49197	1,034051	0,26944	0,942841	1,008472	1,026717
2018	0,613507	1,002136	0,254803	0,94529	0,968938	1,064253

Table5.4: Worldwide Indicators at estimate for Spain during 2002 - 2018

5.8 Methodology

This section employs an unrestricted Vector Autoregression model (VAR) in order to analyze the dynamic interaction between GDP per hour worked and Worldwide Governance Indicators which namely are Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law and Voice & Accountability. Impulse Response Functions, Variance decomposition and Granger Causality analysis are employed to quantify the dynamic relationships.

The VAR approach sidesteps the need to specify a structural model by modeling every endogenous variable as a function of its own lagged values and the lagged values of the other variables in the system. In the literature, VARs have been criticized for being atheoretical, because no a priori theoretical relationship between the variables is assumed (G. K. Christou, 2011; S. Dimelis, 2013).

In its most general form, a VAR with *p* lags can at time *t* be written as follows:

$$Y_t = d + A_t * Y_{t,\,t-p} + e_t$$

where d is the matrix of constant terms, A_t is the matrix of variables' coefficients and e_t is the matrix of the error terms.

In the present case, we will estimate six VARs for each country of this survey in first differences and each VAR consists of four endogenous variables and one exogenous variable, the constant term. The endogenous variables of the VARs that we are going to estimate are: GDP_PHWD1, CC_ESTD1, GE_ESTD1, PV_ESTD1, RQ_ESTD1, RL_ESTD1 and VA_ESTD1. The system features two lags. The VARs' estimation is made using EViews and the below equation corresponds to each variable of the system as follows:

$$GDP\_PHWD1 = d_1 + a_{1,1} * GDP\_PHWD1_{t-1} + a_{1,2} * GDP\_PHWD1_{t-2} + b_{1,1} * CC\_ESTD1_{t-1} + b_{1,2} * CC\_ESTD1_{t-2} + e_{t1} \quad (1)$$

$$CC\_ESTD1 = d_2 + a_{2,1} * GDP\_PHWD1_{t-1} + a_{2,2} * GDP\_PHWD1_{t-2} + b_{2,1} * CC\_ESTD1_{t-1} + b_{2,2} * CC\_ESTD1_{t-2} + e_{t2} \quad (2)$$

Then, we will construct the tables and graphs of the AR Roots of Characteristic Polynomial. No root should lie outside the unit circle so that the VARs satisfy the stability condition.

Continuing, in order to draw some conclusions about endogenous variables of VARs, we will evaluate the Impulse Response Functions, the Variance Decomposition, and the Granger Causality Test. The IRFs express the effect of a sudden shock on a system equation on the endogenous variables. Variance Decomposition table explains in what percentage depends the volatility of an endogenous variable due to its disorder or a disorder of another variable. Finally, the Granger Causality Test examines whether a time series causes another series or whether the lags of a time series help to predict another one.

Specifically, the Granger causality test comprises two hypotheses. The null hypothesis argues that there is no Granger causality in the series, while the alternative hypothesis argues that the independent variables cause according to Granger the dependent variable. Null hypothesis is rejected when Prob.<0.05.

5.9 Econometrical Analysis

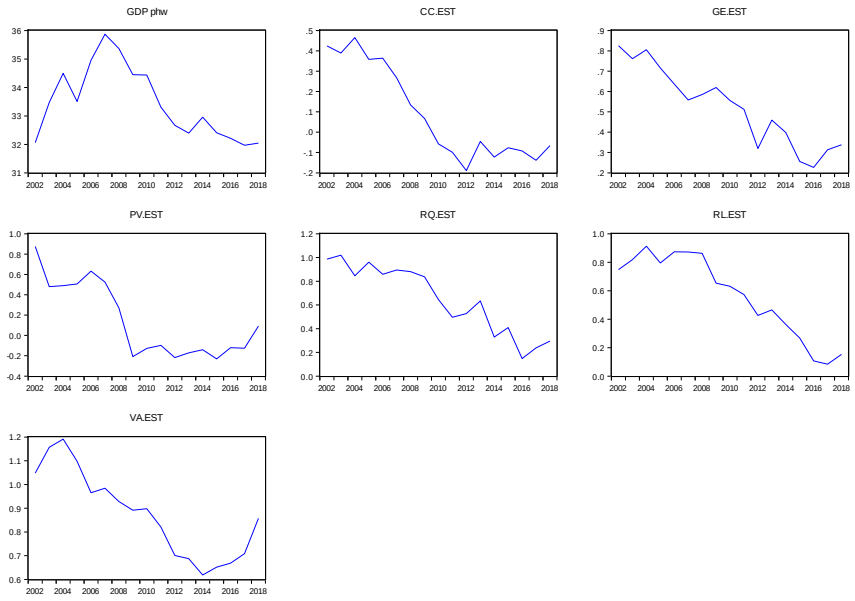

Figure 5.5: The graphs of GDP per hour worked, Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law and Voice & Accountability at estimate are presented for Greece, over the period 2002 – 20018.

From the above timetables of the series, we consider that the series are not stationary and contain a downward trend. Specifically, GDP per hour worked in 2007 reached its peak, while from 2008 to 2012 it continued to decline and 2013 reached its deepest point. From 2007 to 2012 Control of Corruption falls sharply, while 2012 being the year with the lowest levels of corruption's control. In the period 2011 – 2012 and 2015 – 2016 Government Effectiveness is low and from 2006 to 2008 the country's political stability was shaken by the economic crisis of 2007 – 2008, while in 2009 levels of political stability remain low having slightly fluctuations. The graphs of Regulatory Quality, Rule of Law and Voice & Accountability have similar downward trends and some deviations. In addition, the graph of Rule of Law in 2015 continues to have a downward trend, while the graphs of Regulatory Quality and Voice & Accountability begin to rise.

Then, by constructing the series' correlograms, we observe that the series' correlograms at the level have high autocorrelations, whereas the correlograms of the series in the first differences show that the series become stationary (APPENDIX A,I). So, we will examine the joint relationship of time series in first differences that are stationary, as we want the VAR to satisfy the stability condition.

After VAR estimation we observe that all estimates show that there is no good adjustment neither to R^2 nor to adj. R^2. Furthermore, all the coefficients including the constant terms are not statistically significant (APPENDIX A, II).

According to APPENDIX A,III, it is observed that all VARs satisfy the stability condition, since no root of the characteristic polynomial lies outside the unit circle. Also, the roots tend to be close at the center of the unit circle.

Figure IV,1 (APPENDIX A) shows the estimated impulse responses where the graphs of the first column refer to the effect of a sudden shock on the residual e_{t1} and the graphs of the second column refer to the effect of a sudden shock on the residual e_{t2}. In more detail, response of GDP_PHWD1 to GDP_PWD1 refers to the effect of et1 on GDP_PHWD1, which we expect to be direct since et1 is the residual of the equation GDP_PHWD1. Similarly, the effect of e_{t2} on CC_ESTD1 will be direct. The first graph indicates that a sudden shock provokes a negative effect at the series of GDP_PHWD1, which after the second period tends gradually to converge to its long-term levels, while a shock at this residual has a positive effect at the CC_ESTD1 series, which from the fourth period tends to converge to its long-term levels. A sudden shock at the e_{t2} has a positive effect at GDP_PHWD1 until the second period and then gradually tends to converge to its long-term levels. In the last graph we observe that a sudden shock at e_{t2} provokes many intense fluctuations at the CC_ESTD1 which gradually become milder.

In Figure IV, 2 we observe that a sudden shock in residual e_{t3} of GDP_PHWD1 has a negative effect until the second period and then slightly rises in order to converge to its long-term levels, while the disorder at e_{t3} make the series of GE_ESTD1 to converge to its long-term levels. A sudden shock at the residual e_{t4} of GE_ESTD1 equation makes GDP_PHWD1 to converge to its long-term levels having certain slight divergences. A shock at e_{t4} causes intense divergences from the long-term levels of the GE_ESTD1 series.

In Figure IV, 3 we observe that a sudden shock in e_{t5} (GDP_PHWD1 equation) has a similar negative effect at both graphs of the first column until the third period, when the series start to converge to their long-term levels. Also, a sudden shock at e_{t6} (PV_ESTD1 equation) has a positive effect at GDP_PHWD1 which from the third period gradually tends to converge to its long-term levels, while at PV_ESTD1 has a negative effect until the fourth period.

In Figure IV, 4 we observe that a sudden disorder in the residual e_{t7} of the GDP_PHWD1 equation has a negative effect at GDP_PHWD1 until the second period and then starts to converge to its long-term levels, a disorder in e_{t7} drives the RQ_ESTD1 to converge to its long-term levels. The graphs of the response of GDP_PHWD1 to RQ_ESTD1 and the response of RQ_ESTD1 to RQ_ESTD1 have sharp fluctuations due to a sudden shock in e_{t8} of the RQ_ESTD1 equation.

In Figure IV, 5 we observe that a sudden shock in e_{t9} (GDP_PHWD1 equation) has a similar negative effect at both graphs of the first column until the third period, when the series start to converge to their long-term levels. Also, a sudden shock at e_{t10} (PV_ESTD1 equation) has a positive effect at GDP_PHWD1 which from the third period gradually tends to converge to its long-term levels, while at PV_ESTD1 has intense fluctuations until the fourth period.

Finally, in Figure IV, 6 we observe that a sudden shock in e_{t11} (GDP_PHWD1 equation) has a negative effect at both graphs of the first column until the third period, when the series start to converge to their long-term levels. Additionally, a sudden shock at e_{t12} (VA_ESTD1 equation) has a negative effect at both graphs of the second column and gradually tend to converges to their long-term levels.

Afterward, from the table of Variance Decomposition (APPENDIX A, V) we observe that for each variable the largest percentage of its volatility is mainly explained by a disorder in the equation of the variable itself.

Finally, by performing Granger causality test in the series, we conclude that the variables have no causal relationship as Prob. > 0.05 (APPENDIX A, VI).

Following the same procedure, we will examine whether there are causal relationships between the variables of GDP per hour worked and the Worldwide Governance Indicators for Italy, Portugal and Spain respectively.

Consequently, we conclude that for Italy GE_ESTD1 causes GDP_PHWD1 with 2 df (degrees of freedom) and Prob. = 0.0235 and GDP_PHWD1 causes RQ_ESTD1 with 2 df and Prob. = 0.0042. For Portugal we conclude that GDP_PHWD1 causes VA_ESTD1 with 2 df and Prob. = 0.0410 and for Spain we conclude that GDP_PHWD1 causes RL_ESTD1 with 2 df and Prob. = 0.0017 (APPENDIX B).

5.10 Empirical Results

The IRFs of Greece indicate that a sudden shock has a negative effect that leads GDP per hour worked to converge to its long-term levels, while a sudden shock causes intense fluctuations almost at all World Governance Indicators. A sudden shock would be an economic crisis. The tables of Variance Decompositions indicate that for each variable the largest percentage of its volatility is mainly explained by a disorder in the equation of the variable itself. Finally, performing Granger causality test at the Greek series we observe that there no causal relationship between productivity and Worldwide Governance Indicators, which means that Greek productivity does not affected by the quality of Institutions. However, there is causal relationship between productivity and Worldwide Governance Indicators for Italy, Portugal and Spain. Specifically, Italian Government Effectiveness causes productivity measured by GDP per hour worked, while Italian GDP per hour worked causes country's Regulatory Quality. Moreover, GDP per hour worked affects Voice & Accountability in Portugal and Rule of Law in Spain respectively for each country.

In conclusion, according to the existing literature, there is a large amount of evidence that Worldwide Governance Indicators have significant impact on economic growth and productivity. Studies supporting the previous sentence are from G. Peersman et al. (2001), L. Dedola et al. (2006), S. Dees et al. (2007), D. Kaufmann et al. (2010), R. Bouis et al. (2011), B. G. Buchanan et al. (2011) and Y. E. Kim et al. (2017).

Chapter 6: Conclusions

The Financial Crisis of 2007 – 2008 soon took on a global dimension, with the adverse effects of the crisis having a profound effect on European economies. This fact has given the motivation to be examined by various researchers. The main goal of this thesis was to examine how and to what extent the Global Financial Crisis of 2007 – 2008 affected the productivity and growth of European countries that followed austerity policies, and the role played by the quality of Institutions in these countries.

Initially, in Chapter 4 we analyzed GDP per capita which is a measure that indicates a country's economic growth. To be more specific, our data analysis indicates that the GDP per capita of the countries of the Eurozone, the EU and the OECD in total follows the same course. We should mention also that Italy and Ireland are above the GDP curve of the Eurozone, while Cyprus, Greece, Portugal and Spain are below the Eurozone's GDP curve. Additionally, the GDP curves of Latin America & Caribbean and East Asia & Pacific are below of all the GDP curves of the other countries or group of countries. Furthermore, our data analysis also indicates that the productivity of Greece and Portugal is almost at the same levels over the period 1970 – 2018, while the productivity levels of Italy and Spain in 2001 note a slight decline. On the other hand, we observe that the productivity levels of Ireland note a remarkable rise during 2001 – 2018, but in 2008 and 2013 Irish productivity note a fall. In general, the productivity levels of the OECD countries are consistent with the productivity levels of the EU countries, which are both quiet high. However, the productivity of the countries that followed Austerity Policies as Greece, Italy, Portugal and Spain is notably lower than the productivity levels of the Eurozone countries in total.

In Chapter 5, the results of our empirical survey show that there is no causal relationship between productivity (GDP per hour worked) and Institutions (Worldwide Governance Indicators) for Greece. Nevertheless, there is causal relationship between productivity and Institutions for Italy, Portugal and Spain. In addition, the quality of Italian Government Effectiveness has a causal relationship with its productivity.

Consequently, we conclude that the Global Financial Crises of 2007 – 2008 had indeed a negative impact on productivity and growth of the European countries but mostly of the countries that followed an "Austerity Deal" such as Greece, Italy, Portugal and Spain. Moreover, in our survey, Institutions' quality plays a crucial role on productivity and growth of the countries as high quality Institutions provide friendly environments and policies that lead to economic development and growth. Finally, Governance and economic institutions considered also as significant components of Institutions and their quality is associated with productivity. Therefore, in order to improve a country's productivity levels or its growth rate, we should firstly improve the quality of this country's Institutions.

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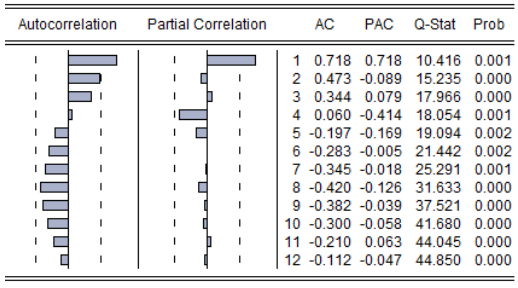
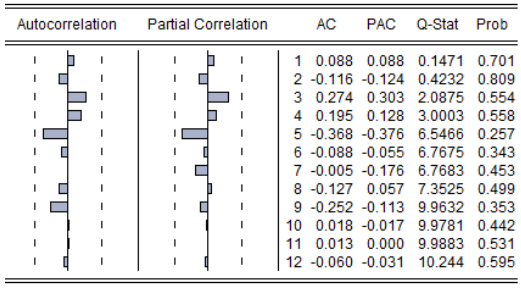
APPENDIX A

I. Correlograms



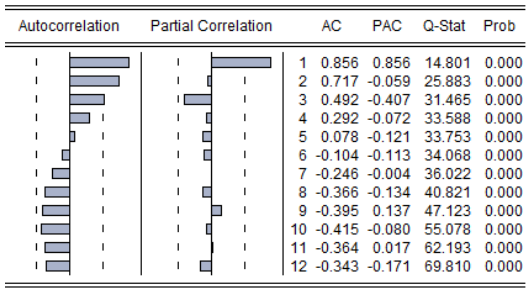
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.718	0.718	10.416	0.001
		2	0.473	-0.089	15.235	0.000
		3	0.344	0.079	17.966	0.000
		4	0.060	-0.414	18.054	0.001
		5	-0.197	-0.169	19.094	0.002
		6	-0.283	-0.005	21.442	0.002
		7	-0.345	-0.018	25.291	0.001
		8	-0.420	-0.126	31.633	0.000
		9	-0.382	-0.039	37.521	0.000
		10	-0.300	-0.058	41.680	0.000
		11	-0.210	0.063	44.045	0.000
		12	-0.112	-0.047	44.850	0.000

***Table I.1:** Correlogram of Greek GDP per hour worked at level*



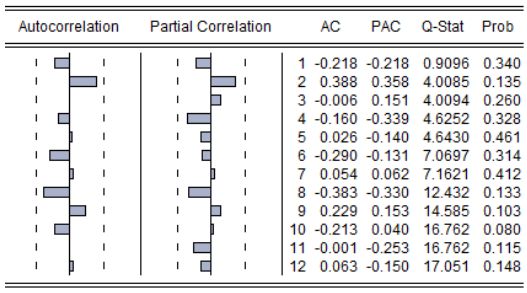
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.088	0.088	0.1471	0.701
		2	-0.116	-0.124	0.4232	0.809
		3	0.274	0.303	2.0875	0.554
		4	0.195	0.128	3.0003	0.558
		5	-0.368	-0.376	6.5466	0.257
		6	-0.088	-0.055	6.7675	0.343
		7	-0.005	-0.176	6.7683	0.453
		8	-0.127	0.057	7.3525	0.499
		9	-0.252	-0.113	9.9632	0.353
		10	0.018	-0.017	9.9781	0.442
		11	0.013	0.000	9.9883	0.531
		12	-0.060	-0.031	10.244	0.595

***Table I.2:** Correlogram of Greek GDP per hour worked at 1st differences*



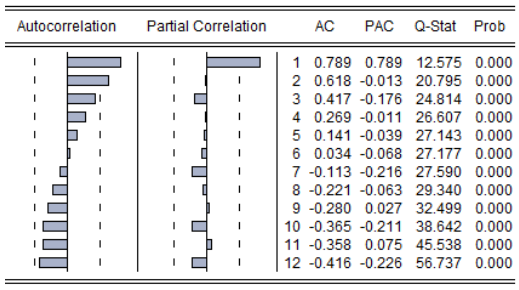
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.856	0.856	14.801	0.000
		2	0.717	-0.059	25.883	0.000
		3	0.492	-0.407	31.465	0.000
		4	0.292	-0.072	33.588	0.000
		5	0.078	-0.121	33.753	0.000
		6	-0.104	-0.113	34.068	0.000
		7	-0.246	-0.004	36.022	0.000
		8	-0.366	-0.134	40.821	0.000
		9	-0.395	0.137	47.123	0.000
		10	-0.415	-0.080	55.078	0.000
		11	-0.364	0.017	62.193	0.000
		12	-0.343	-0.171	69.810	0.000

***Table I.3:** Correlogram of C.C. EST at level for Greece*



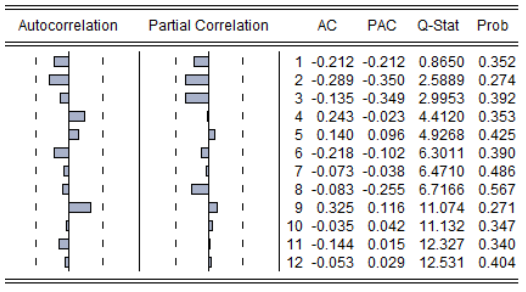
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.218	-0.218	0.9096	0.340
		2	0.388	0.358	4.0085	0.135
		3	-0.006	0.151	4.0094	0.260
		4	-0.160	-0.339	4.6252	0.328
		5	0.026	-0.140	4.6430	0.461
		6	-0.290	-0.131	7.0697	0.314
		7	0.054	0.062	7.1621	0.412
		8	-0.383	-0.330	12.432	0.133
		9	0.229	0.153	14.585	0.103
		10	-0.213	0.040	16.762	0.080
		11	-0.001	-0.253	16.762	0.115
		12	0.063	-0.150	17.051	0.148

***Table I.4:** Correlogram of C.C EST at 1st differences for Greece*



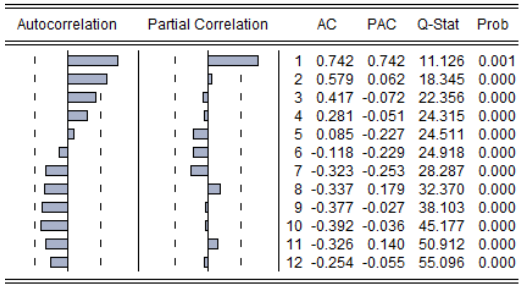
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.789	0.789	12.575	0.000
		2	0.618	-0.013	20.795	0.000
		3	0.417	-0.176	24.814	0.000
		4	0.269	-0.011	26.607	0.000
		5	0.141	-0.039	27.143	0.000
		6	0.034	-0.068	27.177	0.000
		7	-0.113	-0.216	27.590	0.000
		8	-0.221	-0.063	29.340	0.000
		9	-0.280	0.027	32.499	0.000
		10	-0.365	-0.211	38.642	0.000
		11	-0.358	0.075	45.538	0.000
		12	-0.416	-0.226	56.737	0.000

***Table I.5:** Correlogram of G.E . EST at level for Greece*



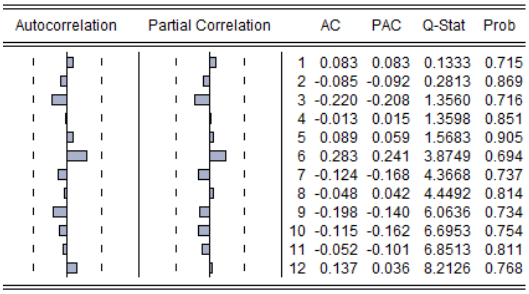
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.212	-0.212	0.8650	0.352
		2	-0.289	-0.350	2.5889	0.274
		3	-0.135	-0.349	2.9953	0.392
		4	0.243	-0.023	4.4120	0.353
		5	0.140	0.096	4.9268	0.425
		6	-0.218	-0.102	6.3011	0.390
		7	-0.073	-0.038	6.4710	0.486
		8	-0.083	-0.255	6.7166	0.567
		9	0.325	0.116	11.074	0.271
		10	-0.035	0.042	11.132	0.347
		11	-0.144	0.015	12.327	0.340
		12	-0.053	0.029	12.531	0.404

***Table I.6:** Correlogram of G.E. EST at 1st differences for Greece*



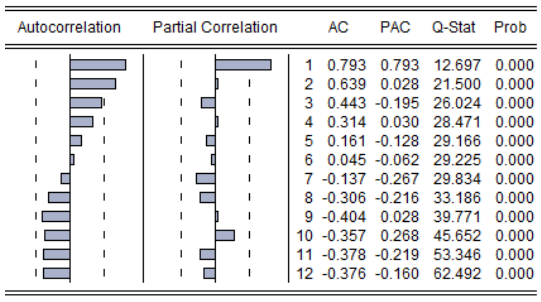
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.742	0.742	11.126	0.001
		2	0.579	0.062	18.345	0.000
		3	0.417	-0.072	22.356	0.000
		4	0.281	-0.051	24.315	0.000
		5	0.085	-0.227	24.511	0.000
		6	-0.118	-0.229	24.918	0.000
		7	-0.323	-0.253	28.287	0.000
		8	-0.337	0.179	32.370	0.000
		9	-0.377	-0.027	38.103	0.000
		10	-0.392	-0.036	45.177	0.000
		11	-0.326	0.140	50.912	0.000
		12	-0.254	-0.055	55.096	0.000

***Table I.7:** Correlogram of P.V. EST at level for Greece*



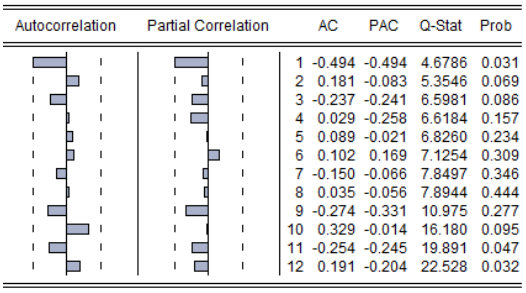
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.083	0.083	0.1333	0.715
		2	-0.085	-0.092	0.2813	0.869
		3	-0.220	-0.208	1.3560	0.716
		4	-0.013	0.015	1.3598	0.851
		5	0.089	0.059	1.5683	0.905
		6	0.283	0.241	3.8749	0.694
		7	-0.124	-0.168	4.3668	0.737
		8	-0.048	0.042	4.4492	0.814
		9	-0.198	-0.140	6.0636	0.734
		10	-0.115	-0.162	6.6953	0.754
		11	-0.052	-0.101	6.8513	0.811
		12	0.137	0.036	8.2126	0.768

***Table I.8:** Correlogram of P.V. EST at 1st differences for Greece*



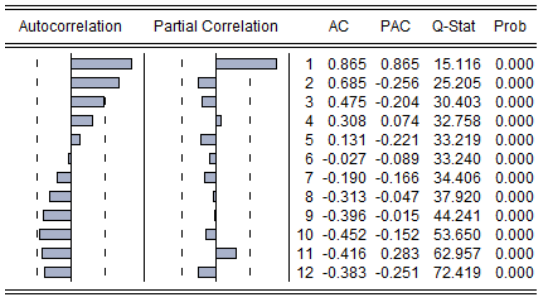
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.793	0.793	12.697	0.000
		2	0.639	0.028	21.500	0.000
		3	0.443	-0.195	26.024	0.000
		4	0.314	0.030	28.471	0.000
		5	0.161	-0.128	29.166	0.000
		6	0.045	-0.062	29.225	0.000
		7	-0.137	-0.267	29.834	0.000
		8	-0.306	-0.216	33.186	0.000
		9	-0.404	0.028	39.771	0.000
		10	-0.357	0.268	45.652	0.000
		11	-0.378	-0.219	53.346	0.000
		12	-0.376	-0.160	62.492	0.000

Table I.9: ***Correlogram of R.Q. EST at level for Greece***



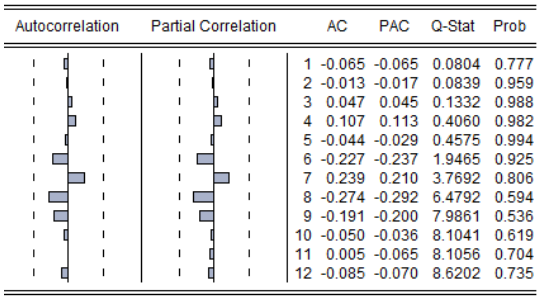
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.494	-0.494	4.6786	0.031
		2	0.181	-0.083	5.3546	0.069
		3	-0.237	-0.241	6.5981	0.086
		4	0.029	-0.258	6.6184	0.157
		5	0.089	-0.021	6.8260	0.234
		6	0.102	0.169	7.1254	0.309
		7	-0.150	-0.066	7.8497	0.346
		8	0.035	-0.056	7.8944	0.444
		9	-0.274	-0.331	10.975	0.277
		10	0.329	-0.014	16.180	0.095
		11	-0.254	-0.245	19.891	0.047
		12	0.191	-0.204	22.528	0.032

Table I.10: ***Correlogram of R.Q. EST at 1st differences for Greece***



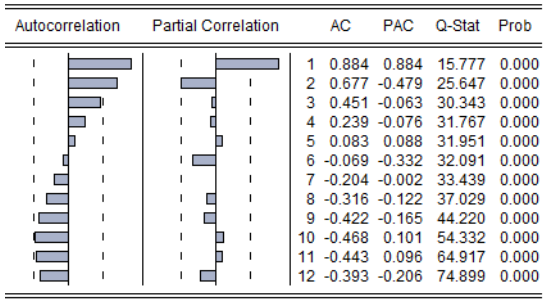
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.865	0.865	15.116	0.000
		2	0.685	-0.256	25.205	0.000
		3	0.475	-0.204	30.403	0.000
		4	0.308	0.074	32.758	0.000
		5	0.131	-0.221	33.219	0.000
		6	-0.027	-0.089	33.240	0.000
		7	-0.190	-0.166	34.406	0.000
		8	-0.313	-0.047	37.920	0.000
		9	-0.396	-0.015	44.241	0.000
		10	-0.452	-0.152	53.650	0.000
		11	-0.416	0.283	62.957	0.000
		12	-0.383	-0.251	72.419	0.000

Table I.11: ***Correlogram of R.L. EST at level for Greece***



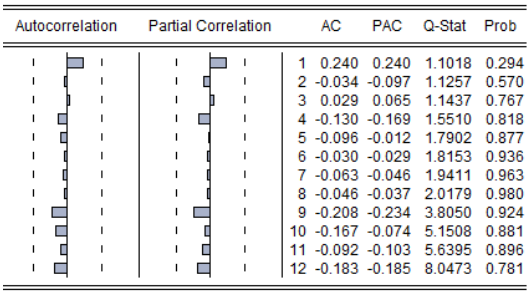
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.065	-0.065	0.0804	0.777
		2	-0.013	-0.017	0.0839	0.959
		3	0.047	0.045	0.1332	0.988
		4	0.107	0.113	0.4060	0.982
		5	-0.044	-0.029	0.4575	0.994
		6	-0.227	-0.237	1.9465	0.925
		7	0.239	0.210	3.7692	0.806
		8	-0.274	-0.292	6.4792	0.594
		9	-0.191	-0.200	7.9861	0.536
		10	-0.050	-0.036	8.1041	0.619
		11	0.005	-0.065	8.1056	0.704
		12	-0.085	-0.070	8.6202	0.735

Table I.12: ***Correlogram of R.L. EST at 1st differences for Greece***



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.884	0.884	15.777	0.000
		2	0.677	-0.479	25.647	0.000
		3	0.451	-0.063	30.343	0.000
		4	0.239	-0.076	31.767	0.000
		5	0.083	0.088	31.951	0.000
		6	-0.069	-0.332	32.091	0.000
		7	-0.204	-0.002	33.439	0.000
		8	-0.316	-0.122	37.029	0.000
		9	-0.422	-0.165	44.220	0.000
		10	-0.468	0.101	54.332	0.000
		11	-0.443	0.096	64.917	0.000
		12	-0.393	-0.206	74.899	0.000

Table I.13: ***Correlogram of V.A. EST at level for Greece***



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.240	0.240	1.1018	0.294
		2	-0.034	-0.097	1.1257	0.570
		3	0.029	0.065	1.1437	0.767
		4	-0.130	-0.169	1.5510	0.818
		5	-0.096	-0.012	1.7902	0.877
		6	-0.030	-0.029	1.8153	0.936
		7	-0.063	-0.046	1.9411	0.963
		8	-0.046	-0.037	2.0179	0.980
		9	-0.208	-0.234	3.8050	0.924
		10	-0.167	-0.074	5.1508	0.881
		11	-0.092	-0.103	5.6395	0.896
		12	-0.183	-0.185	8.0473	0.781

Table I.14: ***Correlogram of V.A. EST at 1st differences for Greece***

II. VAR Estimation

	GDP_PHWD1	CC_ESTD1
GDP_PHWD1(-1)	-0.185928	-0.032667
	(0.30355)	(0.02544)
	[-0.61251]	[-1.28392]
GDP_PHWD1(-2)	-0.127008	-0.038041
	(0.26076)	(0.02186)
	[-0.48708]	[-1.74057]
CC_ESTD1(-1)	2.760924	-0.062870
	(3.01746)	(0.25291)
	[0.91498]	[-0.24858]
CC_ESTD1(-2)	2.269036	0.563758
	(3.04713)	(0.25540)
	[0.74465]	[2.20734]
C	-0.006120	-0.022600
	(0.28028)	(0.02349)
	[-0.02184]	[-0.96201]

R-squared	0.132373	0.493317
Adj. R-squared	-0.253239	0.268125
Sum sq. resids	6.107042	0.042904
S.E. equation	0.823748	0.069044
F-statistic	0.343280	2.190649
Log likelihood	-14.05784	20.64982
Akaike AIC	2.722548	-2.235689
Schwarz SC	2.950783	-2.007454
Mean dependent	-0.175113	-0.037928
S.D. dependent	0.735829	0.080706
Determinant resid covariance (dof adj.)		0.003223
Determinant resid covariance		0.001332
Log likelihood		6.617009
Akaike information criterion		0.483284
Schwarz criterion		0.939754

Table II.1: VAR Estimation at first differences of GDP per hour worked and Control of Corruption at estimate for Greece

	GDP_PHWD1	GE_ESTD1
GDP_PHWD1(-1)	-0.088612	-0.008244
	(0.30273)	(0.03266)
	[-0.29271]	[-0.25244]
GDP_PHWD1(-2)	-0.103782	-0.009075
	(0.27066)	(0.02920)
	[-0.38344]	[-0.31081]
GE_ESTD1(-1)	-0.237790	-0.323675
	(2.82412)	(0.30467)
	[-0.08420]	[-1.06238]
GE_ESTD1(-2)	-0.958701	-0.468259
	(3.04714)	(0.32873)
	[-0.31462]	[-1.42446]
C	-0.232047	-0.064487
	(0.29648)	(0.03198)
	[-0.78267]	[-2.01619]

R-squared	0.037634	0.228079
Adj. R-squared	-0.390084	-0.114998
Sum sq. resids	6.773885	0.078836
S.E. equation	0.867556	0.093593
F-statistic	0.087989	0.664804
Log likelihood	-14.78326	16.39093
Akaike AIC	2.826180	-1.627276
Schwarz SC	3.054415	-1.399041
Mean dependent	-0.175113	-0.033354
S.D. dependent	0.735829	0.088635
Determinant resid covariance (dof adj.)		0.006437
Determinant resid covariance		0.002660
Log likelihood		1.775435
Akaike information criterion		1.174938
Schwarz criterion		1.631407

Table II.2: VAR Estimation at first differences of GDP per hour worked and Government Effectiveness at estimate for Greece

	GDP_PHWD1	PV_ESTD1
GDP_PHWD1(-1)	-0.102894	-0.073353
	(0.30576)	(0.07277)
	[-0.33652]	[-1.00795]
GDP_PHWD1(-2)	-0.108820	-0.042743
	(0.25462)	(0.06060)
	[-0.42738]	[-0.70529]
PV_ESTD1(-1)	0.652982	0.299343
	(1.53326)	(0.36493)
	[0.42588]	[0.82026]
PV_ESTD1(-2)	1.503382	-0.119001
	(1.20116)	(0.28589)
	[1.25161]	[-0.41625]
C	-0.049741	-0.031308
	(0.23374)	(0.05563)
	[-0.21281]	[-0.56276]

R-squared	0.201145	0.205946
Adj. R-squared	-0.153902	-0.146967
Sum sq. resids	5.622969	0.318541
S.E. equation	0.790427	0.188132
F-statistic	0.566531	0.583560
Log likelihood	-13.47976	6.616284
Akaike AIC	2.639965	-0.230898
Schwarz SC	2.868200	-0.002663
Mean dependent	-0.175113	-0.028361
S.D. dependent	0.735829	0.175665
Determinant resid covariance (dof adj.)		0.018276
Determinant resid covariance		0.007553
Log likelihood		-5.529299
Akaike information criterion		2.218471
Schwarz criterion		2.674941

Table II.3: VAR Estimation at first differences of GDP per hour worked and Political Stability and Absence of Violence/Terrorisme at estimate for Greece

	GDP_PHWD1	RQ_ESTD1
GDP_PHWD1(-1)	0.019483	0.056968
	(0.29338)	(0.05786)
	[0.06641]	[0.98450]
GDP_PHWD1(-2)	-0.201958	0.009330
	(0.22932)	(0.04523)
	[-0.88067]	[0.20629]
RQ_ESTD1(-1)	3.927801	-0.572530
	(1.72156)	(0.33955)
	[2.28154]	[-1.68615]
RQ_ESTD1(-2)	1.629189	-0.310942
	(1.98416)	(0.39134)
	[0.82110]	[-0.79455]
C	0.146029	-0.083883
	(0.25803)	(0.05089)
	[0.56594]	[-1.64824]

R-squared	0.388285	0.343532
Adj. R-squared	0.116411	0.051768
Sum sq. resids	4.305731	0.167496
S.E. equation	0.691675	0.136421
F-statistic	1.428183	1.177433
Log likelihood	-11.61137	11.11584
Akaike AIC	2.373052	-0.873691
Schwarz SC	2.601287	-0.645456
Mean dependent	-0.175113	-0.039310
S.D. dependent	0.735829	0.140095
Determinant resid covariance (dof adj.)		0.008834
Determinant resid covariance		0.003651
Log likelihood		-0.440622
Akaike information criterion		1.491517
Schwarz criterion		1.947987

Table II.4: VAR Estimation at first differences of GDP per hour worked and Regulatory Quality at estimate for Greece

	GDP_PHWD1	RL_ESTD1
GDP_PHWD1(-1)	-0.178866	0.033079
	(0.42971)	(0.04825)
	[-0.41625]	[0.68553]
GDP_PHWD1(-2)	-0.315047	-0.024531
	(0.46148)	(0.05182)
	[-0.68268]	[-0.47337]
RL_ESTD1(-1)	1.390254	-0.371295
	(4.29538)	(0.48235)
	[0.32366]	[-0.76977]
RL_ESTD1(-2)	2.360307	0.079432
	(4.22024)	(0.47391)
	[0.55928]	[0.16761]
C	-0.010046	-0.066334
	(0.41343)	(0.04643)
	[-0.02430]	[-1.42883]

R-squared	0.059765	0.166975
Adj. R-squared	-0.358117	-0.203258
Sum sq. resids	6.618113	0.083454
S.E. equation	0.857523	0.096295
F-statistic	0.143018	0.450999
Log likelihood	-14.62041	15.99245
Akaike AIC	2.802916	-1.570350
Schwarz SC	3.031151	-1.342116
Mean dependent	-0.175113	-0.054309
S.D. dependent	0.735829	0.087786
Determinant resid covariance (dof adj.)		0.004334
Determinant resid covariance		0.001791
Log likelihood		4.543720
Akaike information criterion		0.779469
Schwarz criterion		1.235938

Table II.5: VAR Estimation at first differences of GDP per hour worked and Rule of Law at estimate for Greece

	GDP_PHWD1	VA_ESTD1
GDP_PHWD1(-1)	-0.086540	0.015827
	(0.27987)	(0.02674)
	[-0.30921]	[0.59187]
GDP_PHWD1(-2)	0.062947	-0.044767
	(0.27698)	(0.02646)
	[0.22726]	[-1.69166]
VA_ESTD1(-1)	-4.740301	0.483866
	(3.94948)	(0.37735)
	[-1.20023]	[1.28228]
VA_ESTD1(-2)	-2.207098	0.059914
	(3.49686)	(0.33410)
	[-0.63117]	[0.17933]
C	-0.396650	-0.004568
	(0.26341)	(0.02517)
	[-1.50582]	[-0.18149]

R-squared	0.201606	0.300855
Adj. R-squared	-0.153235	-0.009875
Sum sq. resids	5.619721	0.051300
S.E. equation	0.790198	0.075499
F-statistic	0.568159	0.968219
Log likelihood	-13.47571	19.39867
Akaike AIC	2.639387	-2.056953
Schwarz SC	2.867622	-1.828718
Mean dependent	-0.175113	-0.023863
S.D. dependent	0.735829	0.075129
Determinant resid covariance (dof adj.)		0.003413
Determinant resid covariance		0.001410
Log likelihood		6.217197
Akaike information criterion		0.540400
Schwarz criterion		0.996870

Table II.6: VAR Estimation at first differences of GDP per hour worked and Voice & Accountability at estimate for Greece

III. AR Roots Tables & Graphs

Roots of Characteristic Polynomial
Endogenous variables: GDP_PHWD1 CC_ESTD1
Exogenous variables: C
Lag specification: 1 2

Root	Modulus
-0.781358	0.781358
0.325656 - 0.229221i	0.398239
0.325656 + 0.229221i	0.398239
-0.118754	0.118754

No root lies outside the unit circle.
VAR satisfies the stability condition.

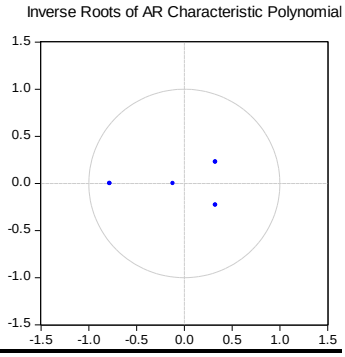


Table & Graph III.1: Roots of Characteristic Polynomial (Endogenous variables: GDP_PHWD1 and CC_ESTD1 and Exogenous variables: C) for Greece

Roots of Characteristic Polynomial
Endogenous variables: GDP_PHWD1 GE_ESTD1
Exogenous variables: C
Lag specification: 1 2

Root	Modulus
-0.167700 - 0.680983i	0.701328
-0.167700 + 0.680983i	0.701328
-0.038444 - 0.282197i	0.284803
-0.038444 + 0.282197i	0.284803

No root lies outside the unit circle.
VAR satisfies the stability condition.

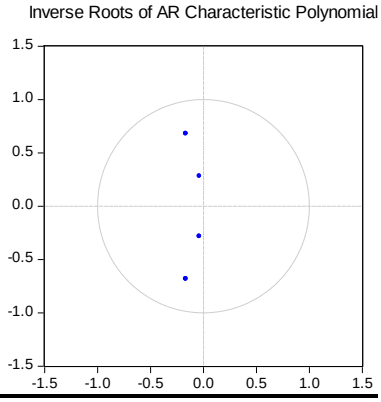


Table & Graph III.2: Roots of Characteristic Polynomial (Endogenous variables: GDP_PHWD1 and GE_ESTD1 and Exogenous variables: C) for Greece

Roots of Characteristic Polynomial
Endogenous variables: GDP_PHWD1 PV_ESTD1
Exogenous variables: C
Lag specification: 1 2

Root	Modulus
0.361444 - 0.570622i	0.675464
0.361444 + 0.570622i	0.675464
-0.263220 - 0.316133i	0.411369
-0.263220 + 0.316133i	0.411369

No root lies outside the unit circle.
VAR satisfies the stability condition.

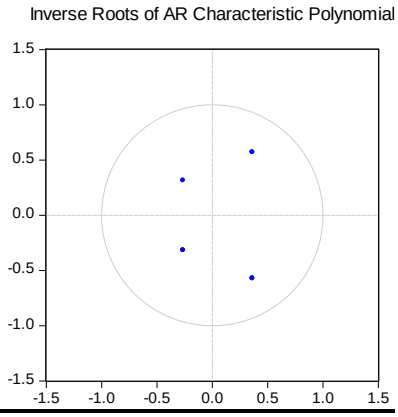


Table & Graph III.3: Roots of Characteristic Polynomial (Endogenous variables: GDP_PHWD1 and PV_ESTD1 and Exogenous variables: C) for Greece

Roots of Characteristic Polynomial
Endogenous variables: GDP_PHWD1 RQ_ESTD1
Exogenous variables: C
Lag specification: 1 2

Root	Modulus
-0.422205 - 0.478377i	0.638045
-0.422205 + 0.478377i	0.638045
0.145682 - 0.309342i	0.341929
0.145682 + 0.309342i	0.341929

No root lies outside the unit circle.
VAR satisfies the stability condition.

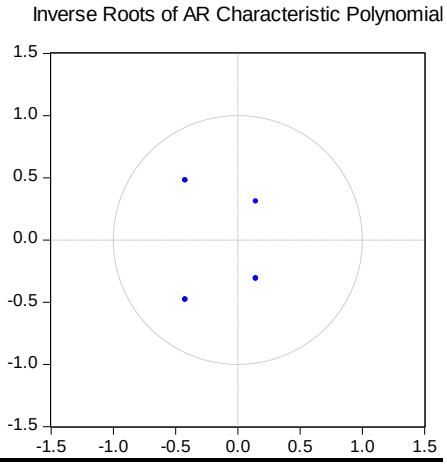


Table & Graph III.4: Roots of Characteristic Polynomial (Endogenous variables: GDP_PHWD1 and RQ_ESTD1 and Exogenous variables: C) for Greece

Roots of Characteristic Polynomial
Endogenous variables: GDP_PHWD1 RL_ESTD1
Exogenous variables: C
Lag specification: 1 2

Root	Modulus
-0.358951 - 0.331549i	0.488642
-0.358951 + 0.331549i	0.488642
0.083871 - 0.361462i	0.371065
0.083871 + 0.361462i	0.371065

No root lies outside the unit circle.
VAR satisfies the stability condition.

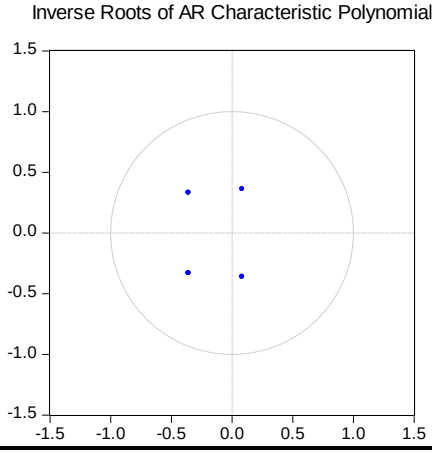


Table & Graph III.5: Roots of Characteristic Polynomial (Endogenous variables: GDP_PHWD1 and RL_ESTD1 and Exogenous variables: C) for Greece

Roots of Characteristic Polynomial
Endogenous variables: GDP_PHWD1 VA_ESTD1
Exogenous variables: C
Lag specification: 1 2

Root	Modulus
0.858391	0.858391
-0.032878 - 0.528192i	0.529214
-0.032878 + 0.528192i	0.529214
-0.395308	0.395308

No root lies outside the unit circle.
VAR satisfies the stability condition.

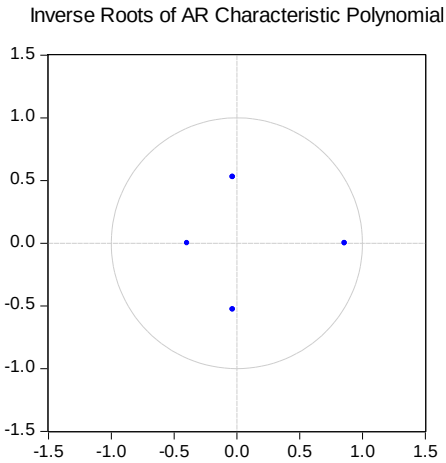


Table & Graph III.6: Roots of Characteristic Polynomial (Endogenous variables: GDP_PHWD1 and VA_ESTD1 and Exogenous variables: C) for Greece

IV. Impulse Responses

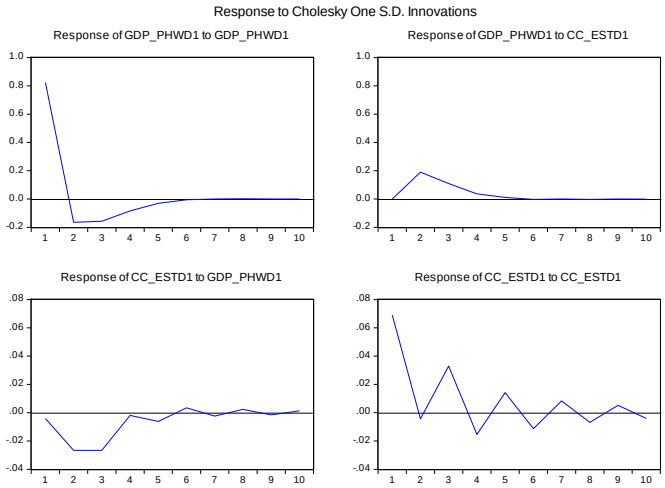


Figure IV.1: IRFs of GDP per hour worked and Control of Corruption at estimate for Greece (at first differences)

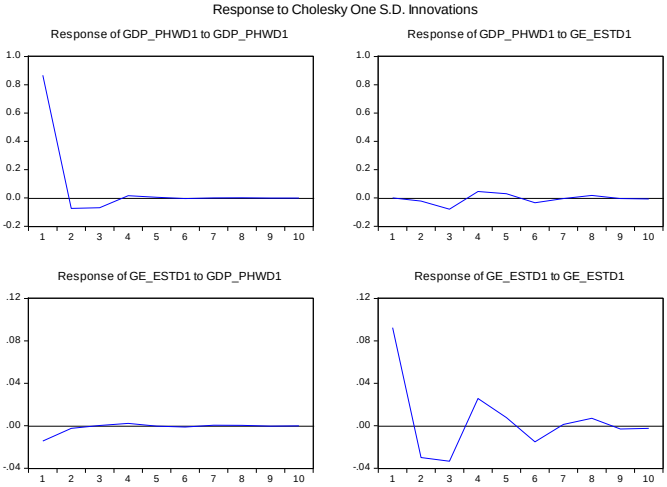


Figure IV.2: IRFs of GDP per hour worked and Government Effectiveness at estimate for Greece (at first differences)

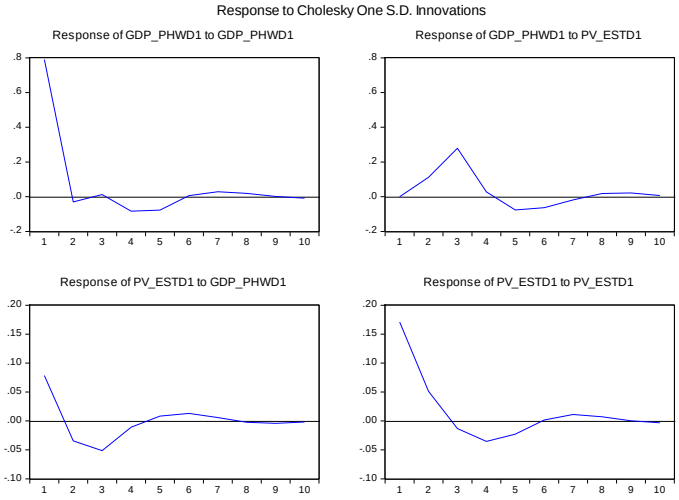


Figure IV.3: IRFs of GDP per hour worked and Political Stability and Absence of Violence/Terrorism at estimate for Greece (at first differences)

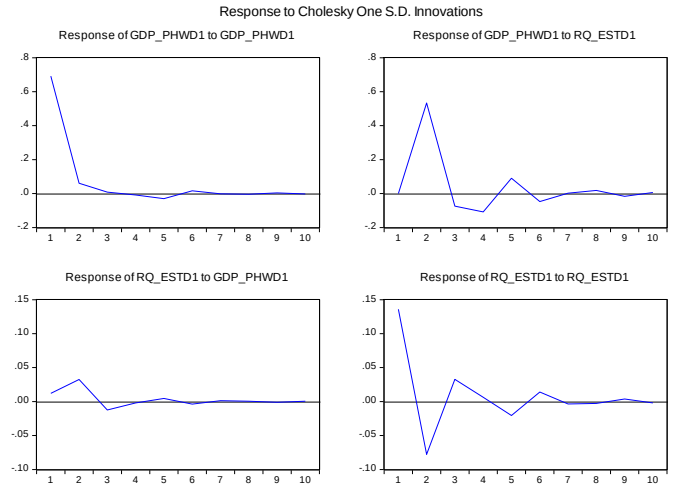


Figure IV.4: IRFs of GDP per hour worked and Regulatory Quality at estimate for Greece (at first differences)

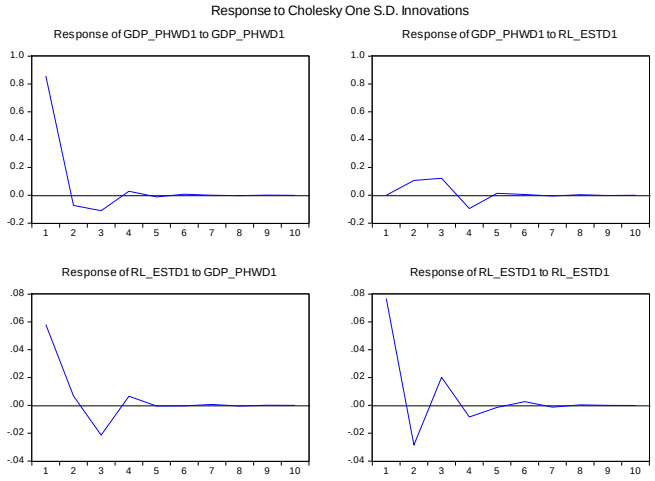


Figure IV.5: IRFs of GDP per hour worked and Rule of Law at estimate for Greece (at first differences)

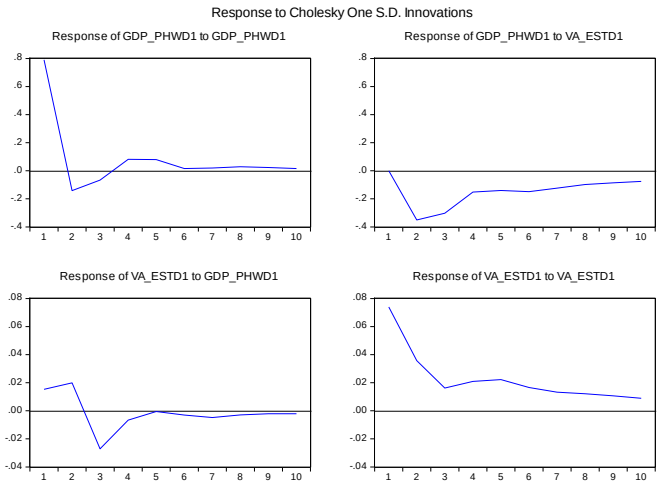


Figure IV.6: IRFs of GDP per hour worked and Voice & Accountability for Greece (at first differences)

V. Variance Decomposition

Variance Decomposition of GDP_PHWD1:			
Period	S.E.	GDP_PHWD1	CC_ESTD1
1	0.823748	100.0000	0.000000
2	0.861303	95.11913	4.880874
3	0.882254	93.82063	6.179366
4	0.886985	93.71619	6.283805
5	0.887579	93.70709	6.292909
6	0.887598	93.70660	6.293404
7	0.887598	93.70660	6.293403
8	0.887603	93.70599	6.294007
9	0.887603	93.70596	6.294044
10	0.887604	93.70587	6.294133

Variance Decomposition of CC_ESTD1:			
Period	S.E.	GDP_PHWD1	CC_ESTD1
1	0.069044	0.356787	99.64321
2	0.074136	13.23160	86.76840
3	0.085366	19.69662	80.30338
4	0.086751	19.12409	80.87591
5	0.088117	19.02562	80.97438
6	0.088906	18.84092	81.15908
7	0.089327	18.73421	81.26579
8	0.089615	18.67925	81.32075
9	0.089779	18.64096	81.35904
10	0.089882	18.61929	81.38071
Cholesky Ordering: GDP_PHWD1 CC_ESTD1			

Table V.1: Variance Decomposition of GDP per hour worked and Control of Corruption at estimate for Greece (at first differences)

Variance Decomposition of GDP_PHWD1:			
Period	S.E.	GDP_PHWD1	GE_ESTD1
1	0.867556	100.0000	0.000000
2	0.870938	99.93625	0.063751
3	0.877295	99.11407	0.885928
4	0.878646	98.84292	1.157076
5	0.879176	98.72688	1.273121
6	0.879840	98.58033	1.419667
7	0.879848	98.57842	1.421581
8	0.880036	98.53670	1.463296
9	0.880046	98.53452	1.465475
10	0.880078	98.52731	1.472685

Variance Decomposition of GE_ESTD1:			
Period	S.E.	GDP_PHWD1	GE_ESTD1
1	0.093593	2.368150	97.63185
2	0.098294	2.211222	97.78878
3	0.103825	1.982649	98.01735
4	0.106982	1.914037	98.08596
5	0.107258	1.905485	98.09452
6	0.108334	1.878992	98.12101
7	0.108343	1.881158	98.11884
8	0.108571	1.874588	98.12541
9	0.108613	1.874462	98.12554
10	0.108641	1.873545	98.12646
Cholesky Ordering: GDP_PHWD1 GE_ESTD1			

Table V.2: Variance Decomposition of GDP per hour worked and Government Effectiveness at estimate for Greece (at first differences)

Variance Decomposition of GDP_PHWD1:

Period	S.E.	GDP_PHWD1	PV_ESTD1
1	0.790427	100.0000	0.000000
2	0.798847	98.04555	1.954447
3	0.846278	87.38469	12.61531
4	0.850815	87.41465	12.58535
5	0.857665	86.82730	13.17270
6	0.860012	86.35919	13.64081
7	0.860698	86.33444	13.66556
8	0.861125	86.30093	13.69907
9	0.861397	86.24704	13.75296
10	0.861463	86.24307	13.75693

Variance Decomposition of PV_ESTD1:

Period	S.E.	GDP_PHWD1	PV_ESTD1
1	0.188132	17.35337	82.64663
2	0.198006	18.70526	81.29474
3	0.204953	23.70730	76.29270
4	0.208252	23.23335	76.76665
5	0.209681	23.07962	76.92038
6	0.210092	23.37331	76.62669
7	0.210465	23.36454	76.63546
8	0.210600	23.34582	76.65418
9	0.210638	23.37376	76.62624
10	0.210671	23.37492	76.62508

Cholesky Ordering: GDP_PHWD1 PV_ESTD1

Table V.3: Variance Decomposition of GDP per hour worked and Political Stability and Absence of Violence/Terrorism at estimate for Greece (at first differences)

Variance Decomposition of GDP_PHWD1:

Period	S.E.	GDP_PHWD1	RQ_ESTD1
1	0.691675	100.0000	0.000000
2	0.875780	62.85813	37.14187
3	0.878928	62.41873	37.58127
4	0.885521	61.50091	38.49909
5	0.890641	60.90717	39.09283
6	0.892028	60.74995	39.25005
7	0.892031	60.74963	39.25037
8	0.892238	60.72351	39.27649
9	0.892396	60.70426	39.29574
10	0.892419	60.70167	39.29833

Variance Decomposition of RQ_ESTD1:

Period	S.E.	GDP_PHWD1	RQ_ESTD1
1	0.136421	0.781343	99.21866
2	0.160373	4.672016	95.32798
3	0.164144	5.033919	94.96608
4	0.164274	5.039561	94.96044
5	0.165619	5.034825	94.96518
6	0.166252	5.048797	94.95120
7	0.166294	5.053155	94.94685
8	0.166316	5.052615	94.94739
9	0.166360	5.053149	94.94685
10	0.166373	5.053613	94.94639

Cholesky Ordering: GDP_PHWD1 RQ_ESTD1

Table V.4: Variance Decomposition GDP per hour worked and Regulatory Quality at estimate for Greece (at first differences)

Variance Decomposition of GDP_PHWD1:

Period	S.E.	GDP_PHWD1	RL_ESTD1
1	0.857523	100.0000	0.000000
2	0.867182	98.48506	1.514943
3	0.882741	96.61257	3.387433
4	0.888281	95.51771	4.482293
5	0.888474	95.49312	4.506877
6	0.888526	95.48971	4.510291
7	0.888541	95.48640	4.513600
8	0.888553	95.48477	4.515229
9	0.888555	95.48450	4.515496
10	0.888555	95.48450	4.515495

Variance Decomposition of RL_ESTD1:

Period	S.E.	GDP_PHWD1	RL_ESTD1
1	0.096295	36.43435	63.56565
2	0.100654	33.80094	66.19906
3	0.104858	35.28644	64.71356
4	0.105395	35.31834	64.68166
5	0.105406	35.31306	64.68694
6	0.105440	35.29127	64.70873
7	0.105450	35.28856	64.71144
8	0.105452	35.28927	64.71073
9	0.105452	35.28935	64.71065
10	0.105452	35.28932	64.71068

Cholesky Ordering: GDP_PHWD1 RL_ESTD1

Table V.5: Variance Decomposition GDP per hour worked and Rule of Law at estimate for Greece (at first differences)

Variance Decomposition of GDP_PHWD1:

Period	S.E.	GDP_PHWD1	VA_ESTD1
1	0.790198	100.0000	0.000000
2	0.875844	83.99040	16.00960
3	0.928949	75.17108	24.82892
4	0.944727	73.41868	26.58132
5	0.958477	72.02310	27.97690
6	0.970076	70.33688	29.66312
7	0.978098	69.22715	30.77285
8	0.983442	68.56363	31.43637
9	0.987474	68.06009	31.93991
10	0.990521	67.66888	32.33112

Variance Decomposition of VA_ESTD1:

Period	S.E.	GDP_PHWD1	VA_ESTD1
1	0.075499	4.116296	95.88370
2	0.085886	8.559085	91.44092
3	0.091489	16.28526	83.71474
4	0.094076	15.89918	84.10082
5	0.096664	15.06269	84.93731
6	0.098120	14.71543	85.28457
7	0.099133	14.65450	85.34550
8	0.099914	14.51132	85.48868
9	0.100501	14.38644	85.61356
10	0.100918	14.31232	85.68768

Cholesky Ordering: GDP_PHWD1 VA_ESTD1

Table V.6: Variance Decomposition GDP per hour worked and Voice & Accountability at estimate for Greece (at first differences)

VI. *Granger Causality Test*

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
CC_ESTD1	1.092726	2	0.5791
All	1.092726	2	0.5791

Dependent variable: CC_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	5.002108	2	0.0820
All	5.002108	2	0.0820

Table VI.1: Granger Causality Test of GDP per hour worked and Control of Corruption at estimate for Greece (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
GE_ESTD1	0.099166	2	0.9516
All	0.099166	2	0.9516

Dependent variable: GE_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	0.178445	2	0.9146
All	0.178445	2	0.9146

Table VI.2: Granger Causality Test of GDP per hour worked and Government Effectiveness at estimate for Greece (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
PV_ESTD1	1.961594	2	0.3750
All	1.961594	2	0.3750

Dependent variable: PV_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	1.874312	2	0.3917
All	1.874312	2	0.3917

Table VI.3: Granger Causality Test of GDP per hour worked and Political Stability and Absence of Violence/Terrorism at estimate for Greece (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
RQ_ESTD1	5.315036	2	0.0701
All	5.315036	2	0.0701

Dependent variable: RQ_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	1.207418	2	0.5468
All	1.207418	2	0.5468

Table VI.4: Granger Causality Test of GDP per hour worked and Regulatory Quality at estimate for Greece (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
RL_ESTD1	0.313334	2	0.8550
All	0.313334	2	0.8550

Dependent variable: RL_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	1.053928	2	0.5904
All	1.053928	2	0.5904

Table VI.5: Granger Causality Test of GDP per hour worked and Rule of Law at estimate for Greece (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
VA_ESTD1	1.967929	2	0.3738
All	1.967929	2	0.3738

Dependent variable: VA_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	3.012308	2	0.2218
All	3.012308	2	0.2218

Table VI.6: Granger Causality Test of GDP per hour worked and Voice & Accountability at estimate for Greece (at first differences)

APPENDIX B

I. *Granger Causality Test - Italy*

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
CC_ESTD1	0.409292	2	0.8149
All	0.409292	2	0.8149

Dependent variable: CC_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	1.511737	2	0.4696
All	1.511737	2	0.4696

Table I.1: Granger Causality Test of GDP per hour worked and Control of Corruption at estimate for Italy (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
GE_ESTD1	7.501889	2	0.0235
All	7.501889	2	0.0235

Dependent variable: GE_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	0.382233	2	0.8260
All	0.382233	2	0.8260

Table I.2: Granger Causality Test of GDP per hour worked and Government Effectiveness at estimate for Italy (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
PV_ESTD1	0.759425	2	0.6841
All	0.759425	2	0.6841

Dependent variable: PV_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	0.716759	2	0.6988
All	0.716759	2	0.6988

Table I.3: Granger Causality Test of GDP per hour worked and Political Stability and Absence of Violence/Terrorism at estimate for Italy (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
RQ_ESTD1	1.060422	2	0.5885
All	1.060422	2	0.5885

Dependent variable: RQ_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	10.92960	2	0.0042
All	10.92960	2	0.0042

Table I.4: Granger Causality Test of GDP per hour worked and Regulatory Quality at estimate for Italy (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
RL_ESTD1	1.268393	2	0.5304
All	1.268393	2	0.5304

Dependent variable: RL_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	1.933081	2	0.3804
All	1.933081	2	0.3804

Table I.5: Granger Causality Test of GDP per hour worked and Rule of Law at estimate for Italy (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
VA_ESTD1	0.869402	2	0.6475
All	0.869402	2	0.6475

Dependent variable: VA_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	2.955830	2	0.2281
All	2.955830	2	0.2281

Table I.6: Granger Causality Test of GDP per hour worked and Voice & Accountability at estimate for Italy (at first differences)

II. *Granger Causality Test - Portugal*

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
CC_ESTD1	2.215460	2	0.3303
All	2.215460	2	0.3303

Dependent variable: CC_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	0.848219	2	0.6544
All	0.848219	2	0.6544

Table II.1: Granger Causality Test of GDP per hour worked and Control of Corruption at estimate for Portugal (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
GE_ESTD1	0.584355	2	0.7466
All	0.584355	2	0.7466

Dependent variable: GE_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	1.288958	2	0.5249
All	1.288958	2	0.5249

Table II.2: Granger Causality Test of GDP per hour worked and Government Effectiveness at estimate for Portugal (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
PV_ESTD1	3.023226	2	0.2206
All	3.023226	2	0.2206

Dependent variable: PV_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	0.278958	2	0.8698
All	0.278958	2	0.8698

Table II.3: Granger Causality Test of GDP per hour worked and Political Stability and Absence of Violence/Terrorism at estimate for Portugal (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
RQ_ESTD1	1.462348	2	0.4813
All	1.462348	2	0.4813

Dependent variable: RQ_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	0.892577	2	0.6400
All	0.892577	2	0.6400

Table II.4: Granger Causality Test of GDP per hour worked and Regulatory Quality at estimate for Portugal (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
RL_ESTD1	0.058221	2	0.9713
All	0.058221	2	0.9713

Dependent variable: RL_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	0.102314	2	0.9501
All	0.102314	2	0.9501

Table II.5: Granger Causality Test of GDP per hour worked and Rule of Law at estimate for Portugal (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
VA_ESTD1	4.394062	2	0.1111
All	4.394062	2	0.1111

Dependent variable: VA_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	6.390400	2	0.0410
All	6.390400	2	0.0410

Table II.6: Granger Causality Test of GDP per hour worked and Voice & Accountability at estimate for Portugal (at first differences)

III. *Granger Causality Test - Spain*

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
CC_ESTD1	2.492958	2	0.2875
All	2.492958	2	0.2875

Dependent variable: CC_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	1.516451	2	0.4685
All	1.516451	2	0.4685

Table III.1: Granger Causality Test of GDP per hour worked and Control of Corruption at estimate for Spain (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
GE_ESTD1	1.229472	2	0.5408
All	1.229472	2	0.5408

Dependent variable: GE_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	3.448128	2	0.1783
All	3.448128	2	0.1783

Table III.2: Granger Causality Test of GDP per hour worked and Government Effectiveness at estimate for Spain (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
PV_ESTD1	0.019222	2	0.9904
All	0.019222	2	0.9904

Dependent variable: PV_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	4.790593	2	0.0911
All	4.790593	2	0.0911

Table III.3: Granger Causality Test of GDP per hour worked and Political Stability and Absence of Violence/Terrorism at estimate for Spain (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
RQ_ESTD1	0.276754	2	0.8708
All	0.276754	2	0.8708

Dependent variable: RQ_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	5.793324	2	0.0552
All	5.793324	2	0.0552

Table III.4: Granger Causality Test of GDP per hour worked and Regulatory Quality at estimate for Spain (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
RL_ESTD1	0.933368	2	0.6271
All	0.933368	2	0.6271

Dependent variable: RL_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	12.73435	2	0.0017
All	12.73435	2	0.0017

Table III.5: Granger Causality Test of GDP per hour worked and Rule of Law at estimate for Spain (at first differences)

Dependent variable: GDP_PHWD1

Excluded	Chi-sq	df	Prob.
VA_ESTD1	0.613673	2	0.7358
All	0.613673	2	0.7358

Dependent variable: VA_ESTD1

Excluded	Chi-sq	df	Prob.
GDP_PHWD1	0.016722	2	0.9917
All	0.016722	2	0.9917

Table III.6: Granger Causality Test of GDP per hour worked and Voice & Accountability at estimate for Spain (at first differences)