

Macro - Econometric Analysis of Business Cycles and Fluctuations, of the Greek Economy, for the past 59 years

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Abstract

The purpose of this study is the macro-econometric analysis of data from the postwar Greek Economy. Notably, in this research we process and examine the time series of various crucial macroeconomic indicators and correlate the quantitative findings with the most significant historical, political and economic facts that had a major impact and have shaped the Greek Economy. Our research differentiates from the literature in two areas: First, the observation horizon is much longer, also we intend to use greater number of variables to analyze the behavior of Business Cycles and Fluctuations and second, we do not use micro-founded models, but rather macro-econometric models, based on aggregated data. However, for this present work we intend only to study the processed data without fitting any macro-economic model. This will be the subject of the subsequent study of my PhD. The importance of this study is to give some additional information or new interpretations of the modern Greek Economy that compliments the work of Economic Historians.

Keywords: business cycles, variables, macro-economics, trend, fluctuations.

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Introduction

The Greek Economy is currently facing a structural crisis, which is reflected in the rapid deterioration of the economic fundamentals factors and the decline of prospects for investments and further economic growth. The importance of the Business Cycles is related to the fact that the economic fluctuations in macro-econometric variables such as unemployment and many others, are economic phenomena that affect economic policy and, by extension, the fiscal one. The prosperity of large groups of people depends on the success with which each government tackles an economic recession or crisis. The experience so far in Greece and others countries of the European Union, indicates that these challenges are not controllable and fiscal policy is not always adapted to the specific features and demands of every country. The present paper will capture in graphs, but will also analyze the Business Cycles in the Greek economy during the period 1960 - 2019 (59 periods).

Literature Review

According to literature review of Business Cycles in the Greek Economy, most economists studied and interpreted the existence of fluctuations in the macro-econometric magnitudes using various econometric or dynamic models. Extensive research was conducted by Kollintzas and Christodoulakis (1993), applying a Real Business Cycle model (RBC) over time series data from 1960-1993 with a quarterly and annual period of time, presented the behavior of the Greek Economy, comparing it with these of EU economies.

The same study was conducted by Vasilatos and Kollintzas (1996), also developed a DGSE (Dynamic Stochastic General Equilibrium) model in order to analyze the business cycles in Greek economy with data up to 1996.

Michailides, Milios, Vouldis and Lapatsioras (2007), analyzed the business cycles in Greece during the period 1960-2008. They conducted an econometric survey and adopted a definition according to which Business Cycles are considered as fluctuations around the central trend, specifically deviation cycles.

Tsouma (2010), in her study, attempted to create a time-series reference for the Greek Business Cycles from the early 1970s to mid-2010. Taking into account the global recession and the recent domestic developments in the late 2000s, were used quarterly GPD data and selected monthly indices covering important sectors of Greek economic activity.

Apergis and Panethimitakis (2011), in their research, analyzed the stylized events of the Greek economy during the period 1960 - 2005. Taking into account the changes in the political regime. The results designated that they were the real disturbances that drive the economy, suggesting that demand management policies are ineffective.

Analysis of Fluctuations of Macroeconomic Variables in a period time of 59 years

In this paper, we have managed to appear a holistic research of some crucial macro-econometrics variables. A collection of macroeconomic data of the Greek economy with annual sampling period, has been carried out by European macroeconomic time series databases and pre-processed using appropriate filters, for the time slot of 59 years. The main indicators that were part of the research are: 1) GDP, 2) Consumption, 3) Employment, 4) Unemployment, 5) Wage, 6) Population, 7) Government Expenses, 8) Self-Employment, 9) National Net Income, 10) National Gross Income and 11) Labor Force.

After the gathering of the variables, the data were processed and normalized, in order to be correlated and comparable. At this point, of the research, that data were precisely normalized, we used a statistical econometric package (E-Views) for the analysis of the variables.

At first, the data were logged, and then by using low pass filter detrending methods such as the filter Hodrick-Prescott with the ultimate goal the modeling of cyclical part of the time series. We separated all the macroeconomic time series into a long term-trend and a cyclical part.

Initially, the logged data were analyzed in the cyclical part of the variables' fluctuations, where graphically plotted the deviation from the central trend of the examined logged sizes, e.g. GDP.

At last, we were able to observe separately the historic evolution of growth and the economic fluctuations.

Graphic Analysis of the Components of Macroeconomic Variables' Fluctuations

It is important to refer and analyze the graphs and the figures, after the separation of the trend and the cyclical components.

LOGGDPCYCLE

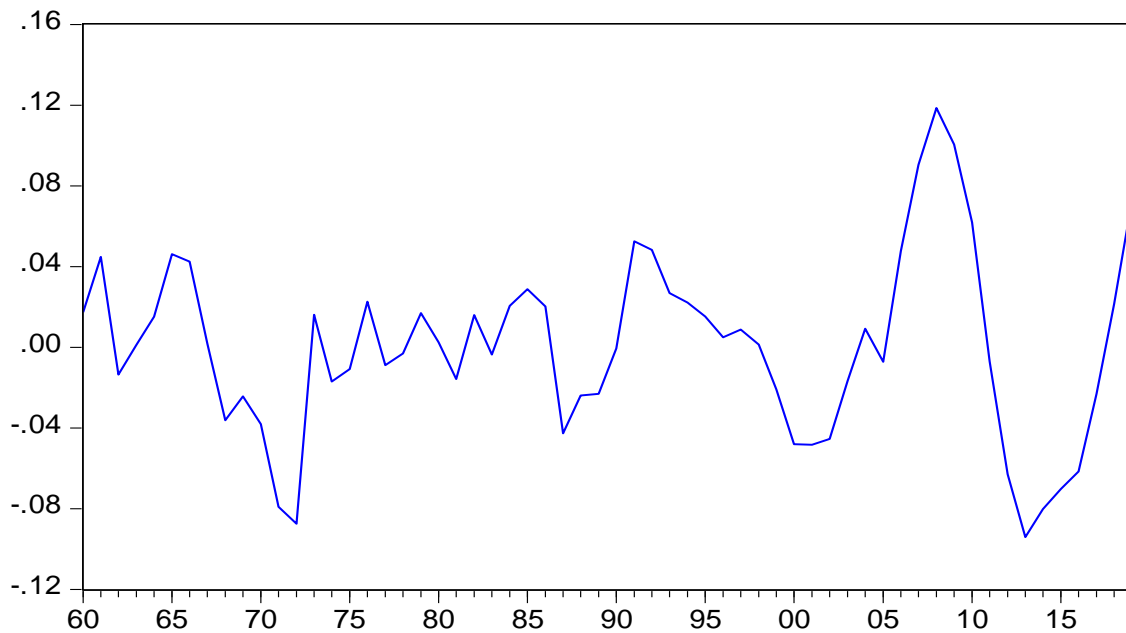


Figure 1: Cyclical Part of the GDP Variable (Db over Years)

Initially, an attempt was made to capture the logged element in a chart relative to the cycle of all macro econometric variables. In the above figure, the cyclical part considered by troughs and peaks that fluctuate over the years. There performed small fluctuations that might be unforeseen events and the remarkable ones due to historical and economic events. Approximately, the peaks of cyclical part of GDP are formed over the years of '66-'67, '77, '91-'93 and the noteworthy augmentations '06-'08 and '17 up today. In the other hand, the ultimate troughs that shaped the GDP variables are connected to the year of '73-'74, '86-'87, '99-'01, '06 and '13. All these fluctuations were occurred from important and notable historical events.

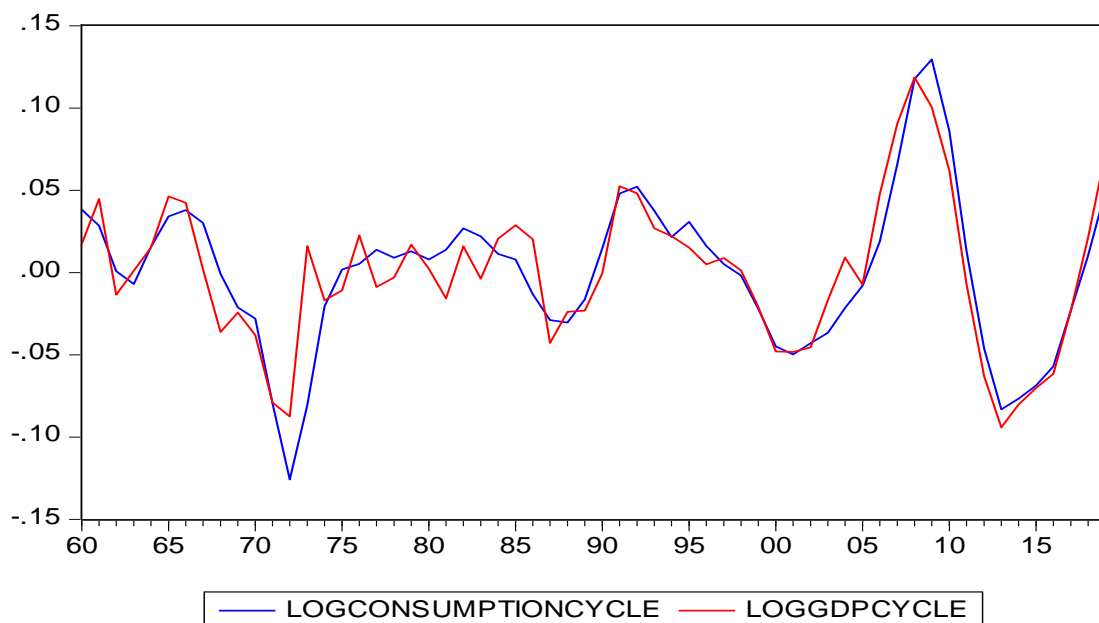


Figure 2: Cyclical Part of the Consumption and GDP Variables (Db over Years)

As seen in Figure 2, the factors of Consumption and GDP are approximately synchronized over the years, with significant fluctuations for both of the variables, it is obvious that these two factors interact and appear equal behavior over the years.

The most remarkable peaks were formed between the years '65-'66, '91-'92, '08 and 2019, and respectively the big decline of the cyclical part is appeared at the years '72, '86, '00 and '13.

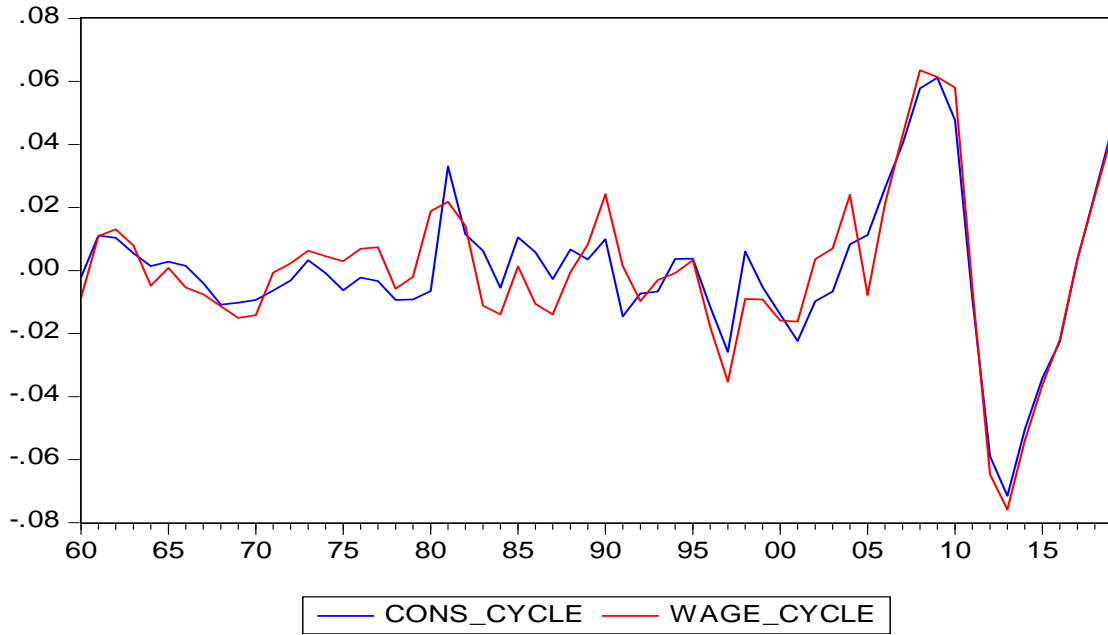


Figure 3: Cyclical Part of the Consumption and Wage Variables

According to the above Figure, the two factors are presented the same behaviour for the timeslot of 59 years. The variables are synchronized, which means that the Consumption depends entirely from the Wage of the consumers, if the Wage is high will have the same impact to the Consumption factor. In opposite manner, the Unemployment moves inversely in relation to the Consumption and the Wage factors.

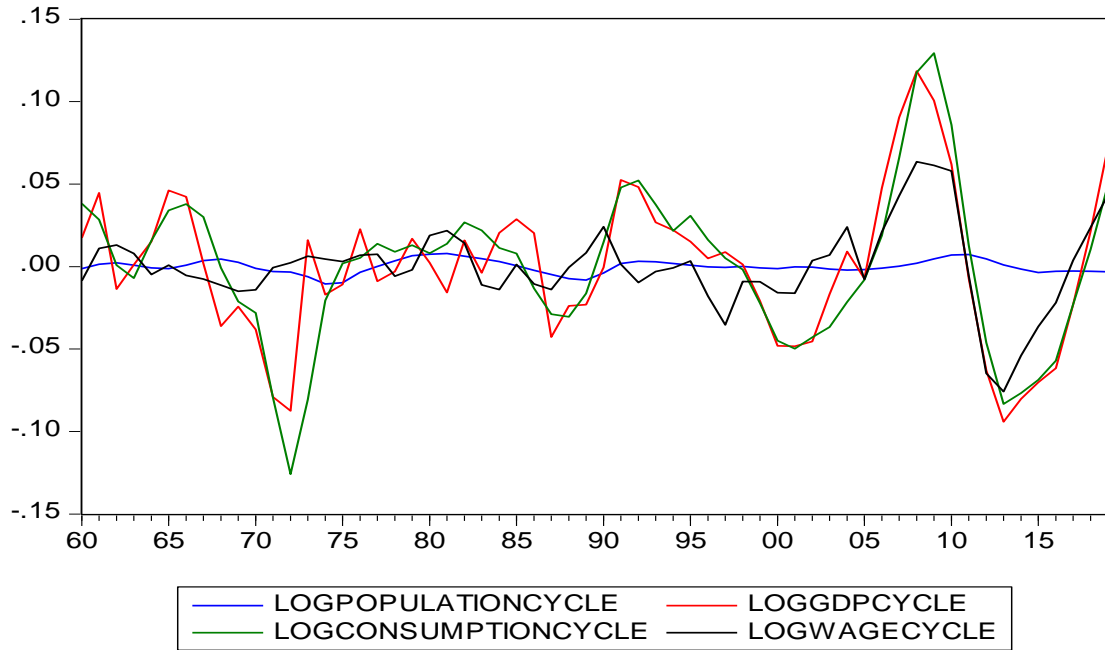


Figure 4: Cyclical Part of the Population- Wage- GDP- Consumption Variables (Db over Years)

In the above graph, the variable of Population is characterized by stability in relation with the others factors Consumption, GDP and Wage, this is expected as there is not significant fluctuation for the factor of Population relatively to the other macro-econometric variables.

The major troughs that have to be referred in the current research are in the years '73-'74, '86-'87, '01, '00-'03 and '13. The most significant peak is in '08.

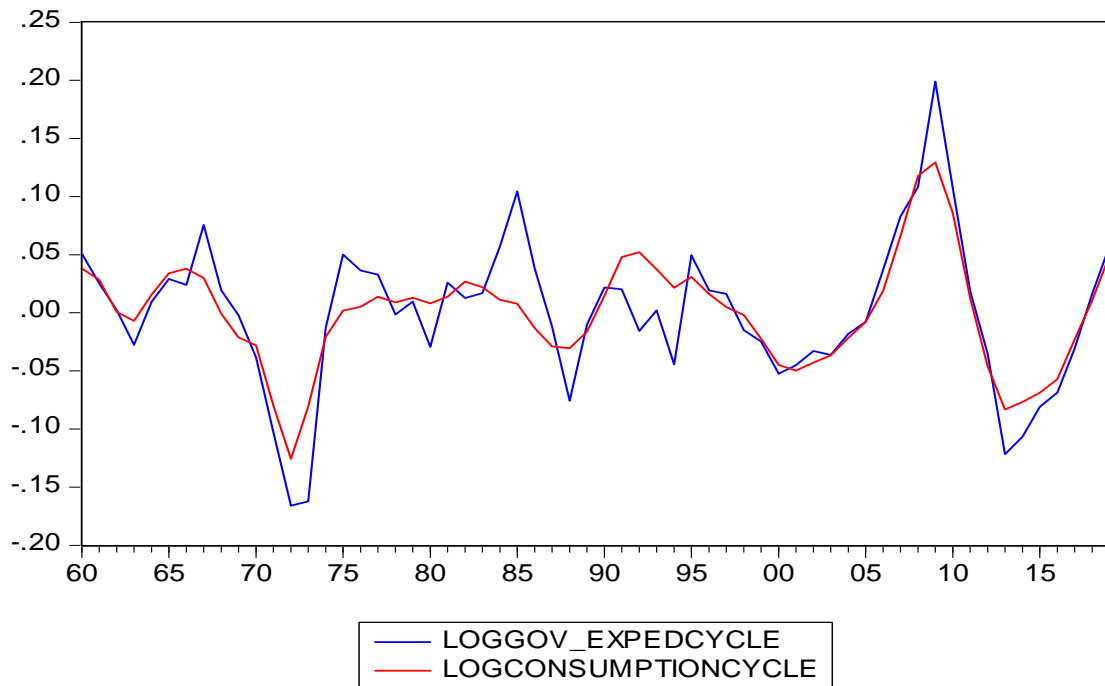


Figure 5: Cyclical Part of the Government Expenditures and Consumption Variables (Db over Years)

In the above sketch, the cyclical portion of Consumption factor is following Government Expenditure fluctuations with smoother capture over the years. The Government Expenditure factor figures several fluctuations with the most significant peaks occurring in the years '67, '85, 95 and 2009 and respectively significant troughs in the years '72 -'73, '88, '95, '99 - '01 and '13.

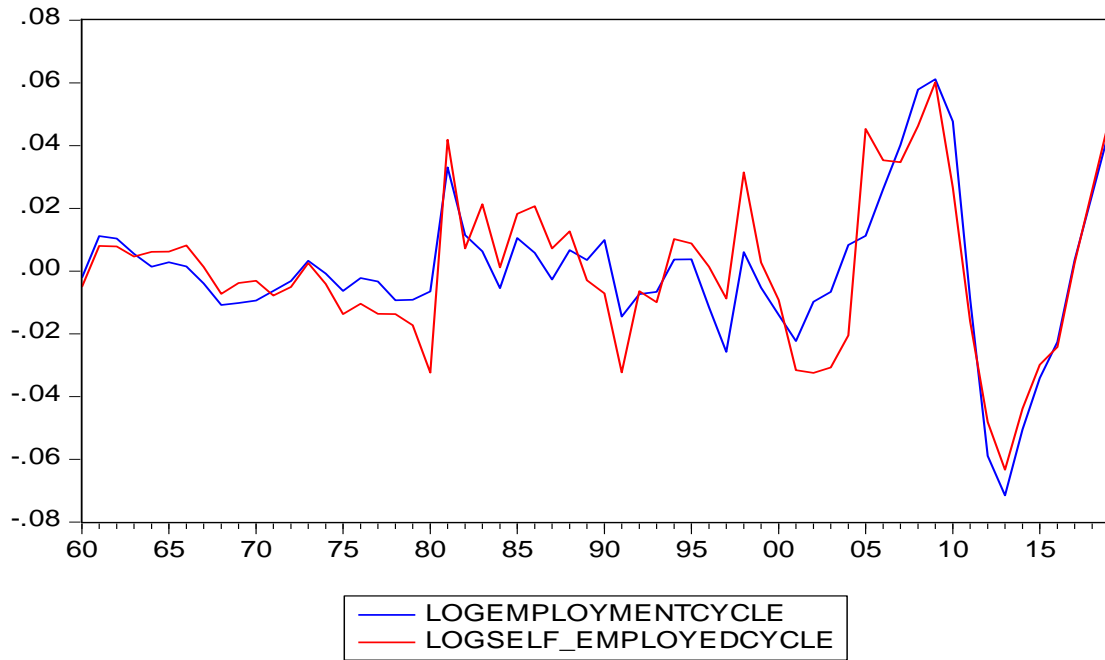


Figure 6: Cyclical Part of the Employment - Self-Employment Variables

In this graph, the components of the macro-econometric variables of Employment and Self-Employment are aligned as relative sizes, as one is an extension of the other factor. As seen in Figure 6, the most remarkable troughs of the fluctuations over the years for the above factors are shaped in '80, '91, '97, '01-'04, with the a significant decline to be formed in '13, the rest of the time the cyclical part of both of the factors characterized from stability or small deviation from the long-term trend. Moreover, there considered and some debatable peaks over the period of 59 years in '81, '98 and there happened a recovery for the years '05-'10 and '13 until the present time.

LOGUNEMPLOYMENTCYCLE

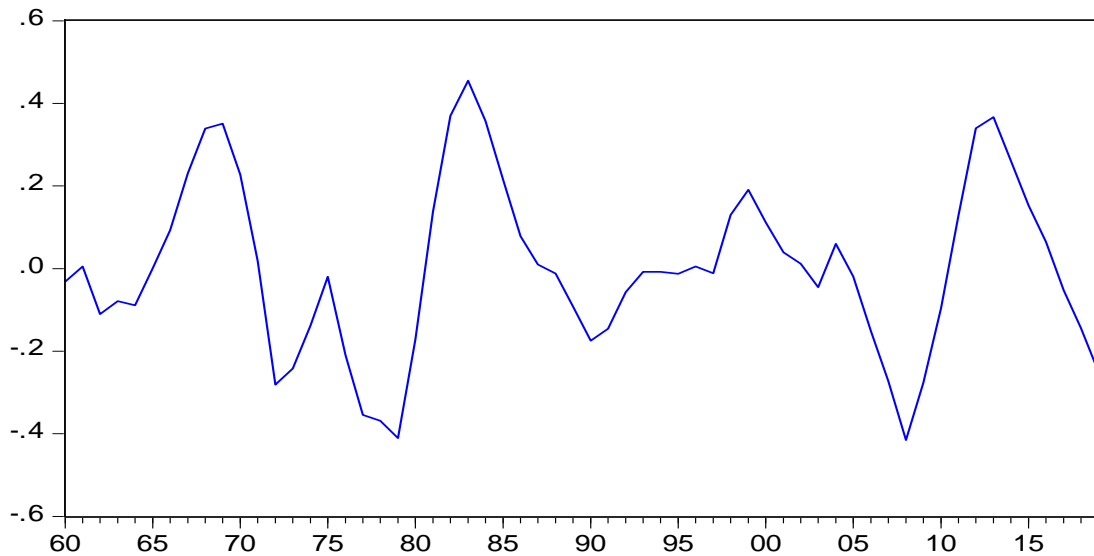


Figure 7: Cyclical Part of the Unemployment Variable (Db over Years)

The variables demonstrate a different pattern during these 59 years, where the Unemployment factor forms the most noteworthy fluctuations over time. The most remarkable peaks were formed between '68-'69, '83-'84, '99 and '12-'13 and respectively significant troughs between '62-'64, '73-'74, '77-'79, '90, '08 and 2019. It is important to refer at this point that the troughs that are appeared as fluctuations at the years of '73-'74, '77-'79, were the impact of the oil crises. The first oil crisis occurred during Arab – Israeli War (1973-1974), where there was a significant augmentation in oil prices, due to the oil embargo of the Arab countries towards the US and the Netherlands. At the same time, oil extraction and supply were reduced under the OPEC agreement (Kotios and Pavlidis 2011). The second oil crisis occurred during the Islamic Iranian Revolution (1979-1980). The political turmoil in Iran has had a significant impact on the country's oil sector, reducing production and exports respectively.

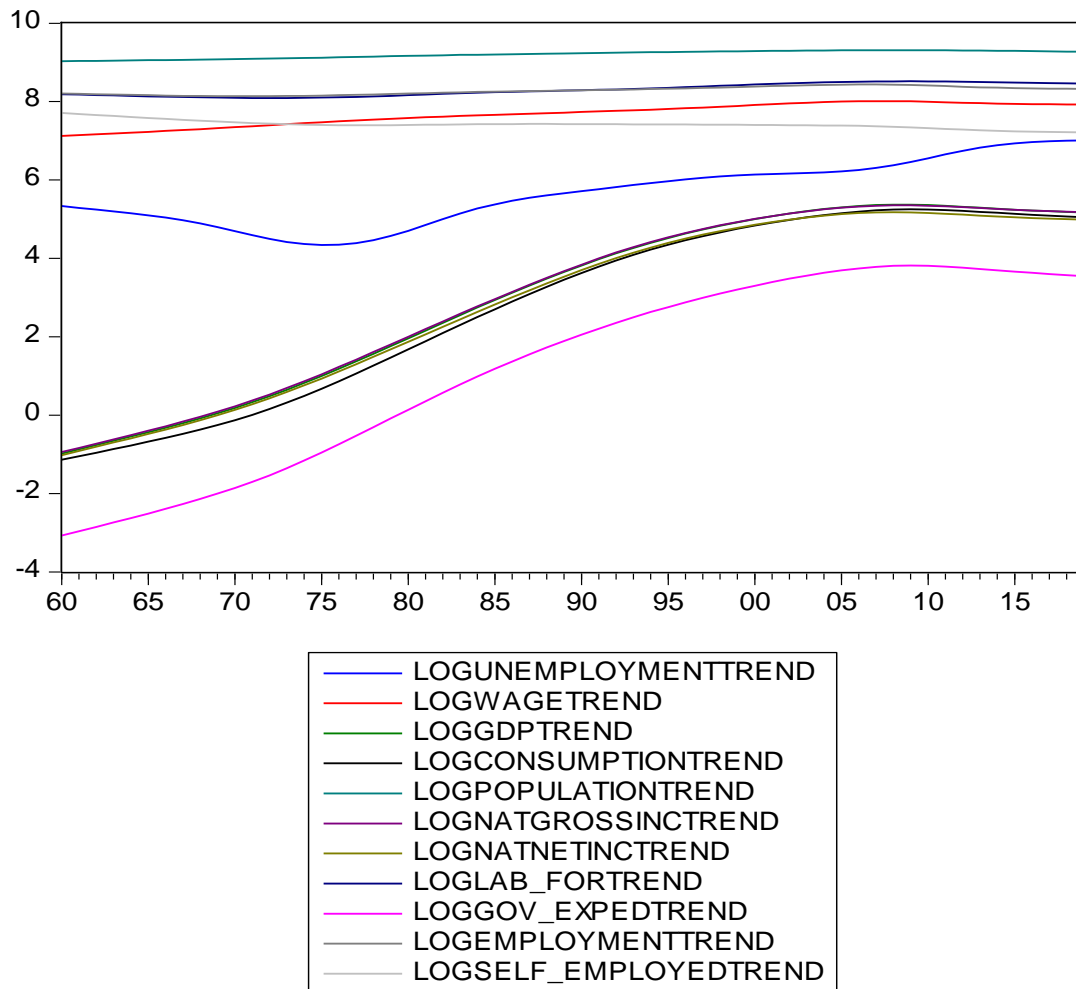


Figure 8: Trend Part of all the Examined Variables (Db over Years)

As seen in Figure 7, the trend part of the variables that is shaped over the time is upward for some of the examined macro-econometric variables, while for others it is characterized by stability. In the above diagram, the tension of the trend of Consumption variable for Greek Economy for the time period of 1960 – 2019, has the same behaviour as the trend of the GDP indicator for the same period. The trends are perfectly matched.

According the Figure 7, it is conceivable that the trend of the Unemployment variable does not have the same behaviour as the trend of the labour for this specific period in Greek Economy.

By the early ‘70s, the Unemployment was not a major problem for most of the world’s economies. From that point onwards, however, combined with the two oil crises, the Unemployment factor was increasing steadily, as a result hitting the European countries and at the same time United States of America and Japan. However, in Europe the growth of the unemployment variable was even higher in the last fifteen years; the employment rate is almost 10% (Database Ameco).

Furthermore, it is important to note that the trends of employment and labour force variables, have almost the same behaviour during the period of 59 years. The labour force factor is a subset component of employment variable. Although, initially (since

1974), the employment has increased steadily, from 2005 until today, it has been blurred, compared with the trend of labour force, that has been enhanced relatively, but as seen from 2008 until today has a downward trend.

The trend of self-employment variable, from initiative year of our study 1960 to 1978 has appeared a declining trend, then is characterized by a small recovery – steady upward trend until 2005, which is justified the allocation of funds through state and European programs, as well as the tendency of individuals to develop businesses through investment.

With regard to the Business Cycles of the examined time series, it seems that for the periods '72-'74, '99-'01 and '13, the most important macro-econometric variables which are Unemployment, GDP, Consumption and Government Expenditures fluctuate in the same mode, as well as in years '67-'68 inline with the large positive shocks of the Greek economy. The "Greek miracle" of the period 1953-1973 (average real growth rate of 7.4%) was largely based on investment. In addition, there were negative shocks that hit the Greek economy and plunged it into a recession and thus an economic crisis, between 1971 - 1972, 1973 - 1974, 1987 and 2009 up to date. The events that imply these negative shocks are in fiscal policy, during the seven-year dictatorship, Greece has increased its debt by 150% within a period of 150 years. In the foreign policy that followed, the oil crisis began in October 1973 until the end of the embargo in March 1974. In 1987, there was also a turmoil that was due to the Greek-Turkish crisis of the Imia and the recession up to date, with the financial crisis of 2009.

The second part of the Chronicle of the Great Depression concerns the developments in the crucial four-year period 2010-2013. 2013 is a landmark year, marking the completion of major changes and halting the Great Depression. Adaptation of the economy was not completed in 2013, in order to be prepared to create the conditions for growth, reducing employment and improving incomes (Bank of Greece 2014). By the end of 2013, 12 banks had been recapitalized, cleared and liquidated, while the Cypriot Crisis (2012-2013) was avoided in the Greek Banking system. Furthermore, the economic crisis in Argentina was one of the most global historical economic crises. The economic situation in the country has separated through two phases: a recession of the economy in 1998-1999 and a collapse of the banking system in 2001-2002 (Papastamou 2011). The terrorist attack in New York on September 11, 2001, has caused turmoil in international markets.

In addition to all, the Olympics are an equally important event that took place in 2004, where was happened a recovery and it is emphasized in the Employment and Self – Employment variables' figure, and as seen in the graphs of cyclical part of Consumption and Wage and GDP factors.

References

1. Apergis, N. and Panethimitakis, A. (2007). 'Stylized Facts of Greek Business Cycles: New Evidence from Aggregate and Across Regimes Data', SSRN Working Paper, Series 54.
2. Christodoulakis, N., Dimelis, S. and Kollintzas, T. (1993). 'Comparisons of Business Cycles in Greece and the EC: Idiosyncracies and Regularities', Centre for Economic Policy Research Discussion, Paper 809.
3. Kotios, A., and Pavlidis, G. (2011). International Financial Crises. Athens: Rosili.
4. Kollintzas, T. and Vassilatos, V. (1996). 'A Stochastic Dynamic General Equilibrium Model for Greece', Centre for Economic Policy Research, Discussion Paper, No. 1518.
5. Kydland, F. and Prescott, E. (1982). 'Time to Build and Aggregate Fluctuations', *Econometrica*, 50, 1345--1371.
6. Lucas, Robert, E., Jr. (1980). 'Methods and Problems in Business Cycle Theory', *Journal of Money, Credit, and Banking* 12, 696 --715.
7. Michaelides, P., Milios, J., Vouldis, A. and Lapatsioras. (2007). 'Business Cycles in Greece (1960-2008): An Econometric Investigation', *Journal of Economics and Business*, Vol. X, No 1, 71--106.
8. Papastamou, A. (2011). 'Global Financial Crises'. Athens: Enastron.
9. Tsouma, E. (2010). 'Dating Business Cycle Turning Points: The Greek Economy During 1970-2010 and the Recent Recession', Research Fellow, Centre of Planning and Economic Research.
10. Ameco European Database, available at https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/macro-economic-database-ameco/ameco-database_en (assessed 18 February 2019).
11. Bank of Greece (2014). The Chronicle of the Great Recession. Athens, available at <https://www.bankofgreece.gr/BogEkdoseis/%CE%A4%CE%BF%20%CF%87%CF%81%CE%BF%CE%BD%CE%B9%CE%BA%CF%8C%20%CF%84%CE%B7%CF%82%20%CE%BC%CE%B5%CE%B3%CE%AC%CE%BB%CE%B7%CF%82%20%CE%BA%CF%81%CE%AF%CF%83%CE%B7%CF%82.pdf> (assessed 23 March 2019).