

**UNEMPLOYMENT IN WESTERN BALKAN
CANDIDATES TO EUROPEAN UNION**

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UNEMPLOYMENT IN WESTERN BALKAN CANDIDATES TO EUROPEAN UNION

ABSTRACT

The aim of this thesis is to study the impact of macroeconomic indicators on unemployment rate in Western Balkan candidates to European Union (Albania, Bosnia and Herzegovina, Macedonia, Montenegro, and Serbia). Labor market conditions and developments in the Western Balkan economies share a number of similarities among them. These economies have a unique challenge which is high unemployment rate.

To study the impact of macroeconomic indicators on unemployment rate, Vector Autoregression (VAR) model and Granger Causality tests are employed. Variables which are being studied in this research are unemployment rate, trade, Consumer Price Index (CPI), Gross Domestic Product (GDP), exchange rate, and interest rate of each country. Data used are annually and corresponds to the period from 2000 to 2015, taken from International Financial Statistics of International Monetary Fund and World Bank.

The results show that unemployment rate is significantly affected by interest rate. This affect is valid for the sample of countries used in this study, from 2000-2015. But unemployment rate resulted to have impact on GDP.

Keywords: *Unemployment, Western Balkan Countries, VAR model, Granger Causality Tests*

NIVELI I PAPUNESISE I VENDEVE KANDIDATE NE BASHKIMIN EUROPIAN TE BALLKANIT PERENDIMOR

ABSTRAKT

Ky studim ka për qëllim të studiojë impaktin e treguesve makro-ekonomikë në nivelin e papunësisë te vendeve candidate në Bashkimin European të Ballkanit Perëndimor (Shqipëria, Bosnja-Hercegovina, Maqedonia, Mali i Zi, dhe Serbia). Tregu i punës dhe zhvillimet ekonomike në vendet e Ballkanit Perëndimor kanë disa ngjashmëri mes tyre. Këto ekonomi kanë një sfidë të veçantë e cila është shkalla e lartë e papunësisë.

Për të studiuar ndikimin e treguesve makro-ekonomikë në normën e papunësisë janë përdorur modeli Vector Autoregression (VAR) dhe testet Granger Causality. Variablat që janë zgjedhur për këtë studim janë: niveli i papunësisë, tregtia, Indeksi i Cmimeve të Konsumit (CPI), Produkti i Brendshëm Bruto (GDP), kursi këmbimit valutor, dhe norma interesit për secilin shtet. Të dhënat e këtyre variablave janë vjetore për periudhën nga viti 2000 deri në 2015, të cilat janë marrë nga Fondit Monetar Ndërkombëtar (IMF) dhe Banka Botërore.

Rezultatet tregojnë se niveli i papunësisë është ndikuar ndjeshëm nga norma e interesit. Ky rezultat është i vlefshëm për shtetet që janë përfshirë në këtë studim, për periudhën 2000-2015. Por niveli i papunësisë rezultoi të ketë ndikim në Produktin e Brendshëm Bruto (GDP).

Fjalët Kyce: *Papunësia, Vendet e Ballkanit Perëndimor, modeli VAR, Testet Granger Causality*

DEDICATION

I would like to dedicate this thesis to my family, my parents and my three siblings, for their unconditional support and love. The support and encouragement of my father has been my biggest strength, the unconditional love of my mother my greatest motivation and trust of my siblings on me my biggest inspiration.

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There are a very few people who I would like to thank for helping and assisting me in the preparation of my master thesis. I owe my special thanks to my thesis supervisor, associate professor Ugur Ergun. Having the opportunity to work with him was intellectually rewarding and fulfilling. His contribution, suggestions and expertise starting from the early stages of this work until today helped me write and finish this thesis successfully.

DECLARATION

I hereby declare that this Master's Thesis titled "Unemployment in Western Balkan Candidates to European Union" is based on my original work except quotations and citations which have been duly acknowledged. I also declare that this thesis has not been previously or concurrently submitted for the award of any degree, at Epoka University, any other University or Institution.

Jonida Balliu

June 20, 2016

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LIST OF ABBREVIATIONS

| | |
|------|------------------------------------|
| ADF | : Augmented Dickey Fuller |
| ARDL | : Auto-Regressive Distribution Lag |
| CPI | : Consumer Price Index |
| EU | : European Union |
| FDI | : Foreign Direct Investment |
| GDP | : Gross Domestic Product |
| IMF | : International Monetary Fund |
| NKPC | : New Keynesian Phillips Curve |
| OLS | : Ordinary Least Squares |
| PP | : Phillip-Perron |
| VAR | : Vector Autoregressive |
| VAT | : Value Added Tax |
| US | : United States |

CHAPTER 1

INTRODUCTION

1.1 Introduction

The aim of this study is to examine the impact of the selected macroeconomic variables on unemployment rate in the Western Balkan economies.

Labor markets in these selected countries (Albania, Bosnia and Herzegovina, Macedonia, Montenegro, and Serbia) have low employment rates and high unemployment rate in Europe. Unemployment is considered as important economic and political issue that society has to deal with. Much has been written about labor market problems and unemployment issue in developed Western Europe including the countries that are part of euro-zone. Labor market conditions and developments in the Western Balkan economies share a number of similarities among them. These economies have a unique challenge which is high unemployment rate.

Unemployment is defined as the proportion of people which are able to work and actively searching jobs but they could not find a job. When labor market performs weak is an important social concern. The reasons of high unemployment are many, but the most important is the economic crisis that affects the whole economy. All Western Balkan countries fall into recession in year 2009, except Albania and Kosovo that could maintain positive economic growth.

The group of countries selected for this study, are candidate countries for European Union. In comparison to EU member states, candidate countries are characterized by high unemployment rates and higher youth unemployment than in EU member states (Knogler, 2011).

With the globalization the countries can easily trade with each other. Regarding open trades, exchange rates started to have a crucial role in the economy by impacting on the employment rate of a country. When the domestic currency devaluated, exports increase and as a consequence expenditure of imports reduces. By the open trades, foreign currency inflow is increased and economies tend to grow and as result the unemployment rate falls. But, some researchers like Bratsiotis and Robinson (2002) concluded that exchange rate crises have impact on economy and unemployment rate in developing economies. By the exchange rate devaluation, they refer as crises, because according to them the benefits of devaluation are not for the long term.

This thesis is divided into five chapters. The first chapter consists of introduction of the research topic. The second chapter contains literature review framework. This chapter explains the main factors affecting the rate of unemployment. Also there is a review of the previous studies conducted by different scholars on this topic. The third chapter explains the data that are used in this paper and the methodology used in order to explore the impact of the selected macroeconomic variables on the unemployment rate. The next chapter is an examination of the empirical results for the Western Balkan Countries. In the last chapter are discussed the results and conclusions.

1.2 Economies of Western Balkan Countries

Regarding the economy of Albania in recent years has economic growth. Generally Albania had maintained financial stability and positive growth rates, despite the economic continuing crises. Before the global financial crises, Albania experienced fast economic growth by 6 % annual real growth rate. However, after 2008 real growth rate declined, and unemployment increased from 12.5% in 2008 to 17.6% in 2014.

In Albania agriculture remains one of the main sectors regarding the income and employment. Agriculture sector in year 2015 represents around 21% of GDP and accounting for about 43.3% of the workforce. (World Bank, Annual Report, 2015)

Referring the macroeconomic conditions of Bosnia-Herzegovina, in the second half of 2008 began to decline in economic activity. One of the factors causing this decline was the global financial crisis. Also, structural and political problems of Bosnia-Herzegovina affect negatively the economy. Then, the governments of Bosnia-Herzegovina turned to the International Monetary Fund (IMF) for assistance. The main problematic issue is a lack of unified economic issues between the Republic of Srpska and the Federation of Bosnia and Herzegovina. This issue has resulted in imprudent monetary policy and in different fiscal and taxation systems between the two entities. The regime of domestic currency is fixed, attaching the Bosnian mark to the Euro. This resulted in low inflation in the entire country. Regarding the unemployment, in 2015 is estimated around 44.6%. (World Bank, Annual Report, 2015)

Macedonia, since its independence in 1991, has made a significant progress in economy and improving its business environment, but has not been able to attract foreign investment. Regarding the unemployment issue has remained high at more than 30% since 2008. In Macedonia is present a wide gray market, estimated to be between 20% and 45% of GDP that is not captured by official statistics. So the unemployment rate may be overestimated because of the existence of a wide gray market. Macedonia could maintain macroeconomic stability through the global financial crisis by conducting

appropriate monetary policy. In 2013 it achieved a modest GDP growth after a reduction in year 2012. The inflation is under control, and is about 2.8%.

(World Bank, Annual Report, 2015)

The economy of Montenegro is slowly passing to a market system, but the state sector remains huge. Foreign tourism and export of refined metals are very crucial for the economic growth of this country. The global financial crises had a significant negative impact on the economy, due a decline in real estate sector, a decrease in aluminum exports, and credit crunch. The Government of Montenegro increased value added tax (VAT) to 19% in 2013 from 17% in year 2012. In 2015 the inflation was 4% and unemployment rate 19.1%. (World Bank, Annual Report, 2015)

Serbia's economy in 2008 was facing many economic challenges. Some of them were by internal factors (macroeconomic instability), but some of them are by external factors (such as global financial crises and the Euro zone crises). Serbia was facing large macroeconomic imbalances because its economic growth model was import and consumption driven, financed by borrowings. These macroeconomic imbalances resulted in current account deficit, volatile inflation and high unemployment rate. To put the country on a sustainable growth path, reforms consisting of macroeconomic stabilization were necessary. Macroeconomic stabilization has a positive impact on Foreign Direct Investments (FDIs) by increasing the economic growth to 30% in year 2015. The rise of FDIs in Serbia is higher than almost in any country in central and Southeast Europe. This is the consequence of the expansionary monetary policies of global players and reforms. Due to increase in exports and investment there is a positive economic growth. (World Bank, Annual Report, 2015)

1.3 Objective of the Study

The objectives of this thesis are:

- a. To analyze unemployment in Western Balkan countries by descriptive and graphical analysis. How unemployment has changed over time for these countries.
- b. To examine the impact of macroeconomic indicators on unemployment by using vector auto-regressive (VAR) model and Granger Causality Tests

1.4 Motivation

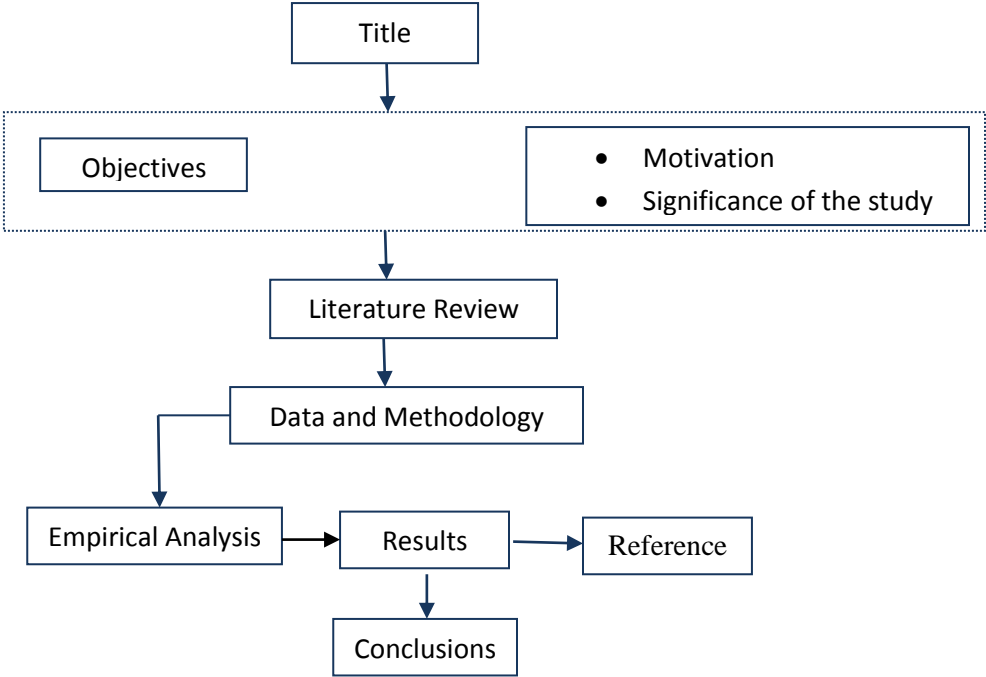
Unemployment is a unique challenge for the Western Balkan candidates to EU and for many years unemployment rate is high in these countries. Since the unemployment affect the whole economy, it is very crucial to find out which factors impact the unemployment rate in these countries. This thesis takes in consideration some macroeconomic indicators to understand if they affect unemployment rate and what can be done to reduce it.

1.5 Significance of the Study

Unemployment issue plays a crucial role in the development of economies. Since the unemployment rate is high in this group of countries, there are many constrains for a higher future growth, especially in developing economies.

This thesis conducts the analysis through vector auto-regression (VAR) model and Granger Causality Tests in order to understand the impact of each selected macroeconomic variable on the unemployment rate. This will benefit both the researchers and to the policymakers of these countries. Also this study will serve to give them a clearer view of how the macroeconomic variables affect the unemployment rate.

1.6 Analytical Framework

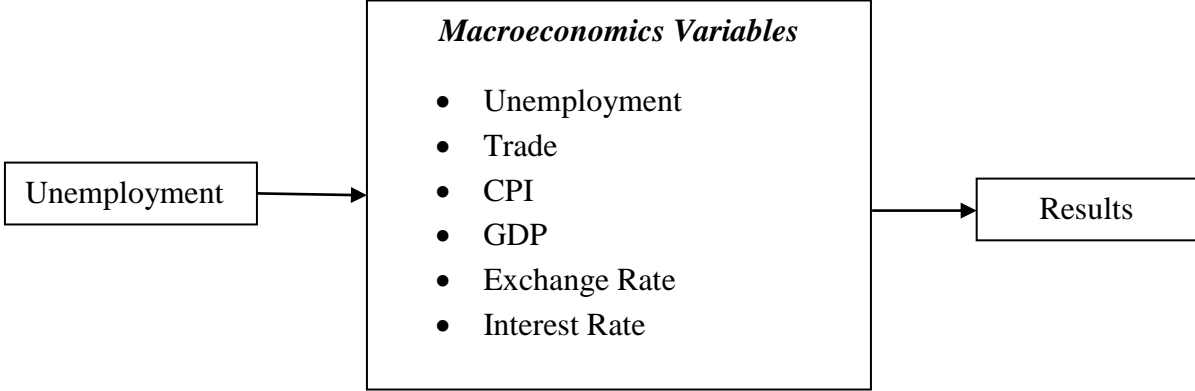


1.7 Theoretical Framework

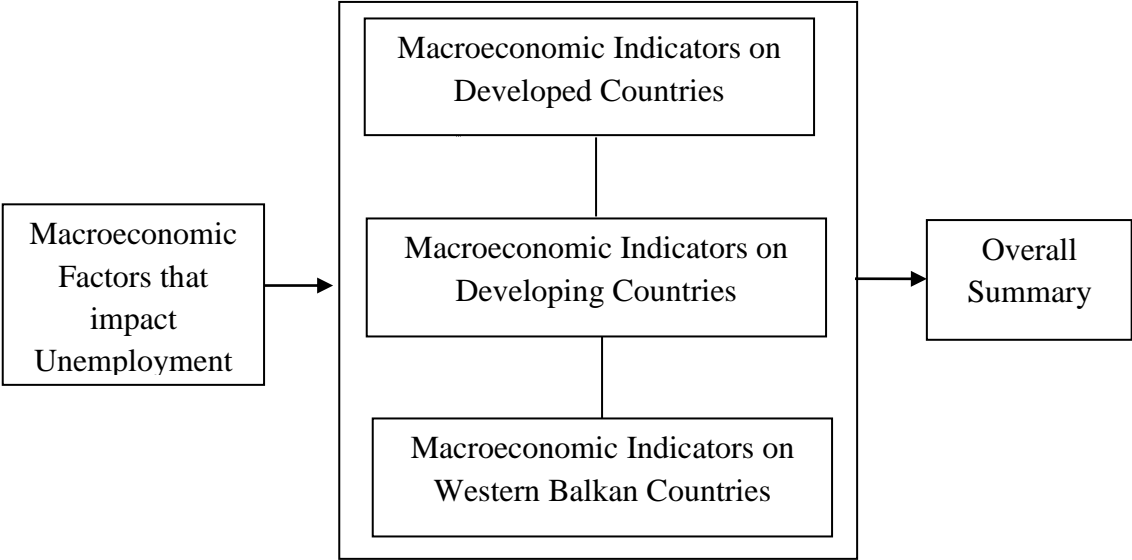
| Theories/Theoretical Background | Authors |
|--|-----------------|
| “Philips Curve” | (Philips, 1958) |
| “Okun’s Law” | (Okun, 1962) |
| “The General Theory of Employment, Interest and Money” | (Keynes, 1936) |

- One of the main theories that are related with this research is Phillips Curve which is named by A.W.Phillips in 1958. It shows that the unemployment rate and inflation rate are inversely related with each other in an economy. It is an essential tool to analyze macroeconomic policy. Philips curve states that if unemployment decreases (employment increases) in an economy will results in higher rates of inflation.
- Okun Law states that if rate unemployment falls by 1%, then the level output will be increased by 3%. The economy should expand continuously in order to avoid losses from unemployment. This law is simple and consistent, by taking in consideration two important macroeconomic variables.
- John Maynard Keynesian argued in the book: General Theory of Employment, Interest and Money that rate of employment is determined by the total demand for goods. In a closed economy the total demand is determined by consumption and investment. Investment depends on the interest rate, which is determined by money supply and money demand, while consumption depends mostly on the level of real income.

1.8 Research Model



1.9 Literature Review Flowchart



CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter includes framework of the literature review. In this chapter is an explanation of the main macroeconomic factors affecting the unemployment rate. Also is important to make a review of the previous studies conducted by different scholars on this topic. The economic literature is reach with numerous studies that reflect the relation between rate of unemployment and economic growth. The first part of the literature is regarding the developed countries, the second part for the developing countries, and the last one for the Western Balkan countries candidate to EU like: Albania, Bosnia and Herzegovina, Macedonia, Montenegro and Serbia.

2.2 Unemployment in Developed Countries

This section explains the main macroeconomic factors that have impacted the unemployment rate in different developed countries. Unemployment issue is described as socio-economic problem by Kitov.I and Kitov.O (2009). Another scholar, Caraiani, 2006 explains that the labor market of a country affect directly the life of the people. His study is for the Korean labor market for thirty four years, from 1970 to 2004. In order to analyze the coefficients of Okun, Caraiani uses regression analysis. The findings conclude that employment and unemployment rate cyclical behavior are consistent, independent from the frequency.

From this research is indicated that labor market in Korea is one of the heaviest regulated among countries with high economic growth. Christopoulos (2004) did a research in Greece. He applied unit root tests to check the stationarity of the data. Also he uses cointegration tests on panel data and estimated

Okun's law. The results of this study are consistent with Okun's law in six regions from thirteen regions that were part of the research.

In Austrian economy is also made a study regarding Okun's Law. Sogner (2001) uses quarterly data of GDP growth and unemployment rate. Initially the Okun's coefficients were 2 percent to 3 percent, but in this research they found to be 4.16 percent.

Neely (2010) says that different laws, technology, preferences, social traditions and demographics affect the relationship of unemployment to output growth. So, the coefficient of Okun may change by time. Also he noted that developed economies with less regulated labor markets tend to have smaller Okun's coefficients.

Regarding, the period 1960-1997 Brauninger and Pannenberg (2002) shows that the rise of unemployment rate was accompanied by a fall in a productivity growth in Europe and US.

Another scholar, Seyfried (2005) studied the GDP growth and employment rate relationship in ten countries which have developed economies. This study shows that economic growth has a positive significant impact on employment level. By the increase in GDP, unemployment rate decreases and employment rate increases. Also economic growth improves the standards of living.

There is a study regarding the relationship of unemployment rate and real GDP of three countries such as: France, Greece and Spain. The scholars, Rigas. J and Blanes (2011) want to examine if Okun's Law is still valid in today's economy. The results of this

research conclude that the relationship of GDP to unemployment rate differ significantly among the three countries selected in this study. He uses granger causality test to check if the relationship of unemployment rate and GDP is a two-way causal relation.

Form the findings in any of the countries does not exist a two- way causal relation between GDP and unemployment rate.

A study regarding the output and unemployment rate relationship is done by Revored-Giha.C and Renwick (2012) in Scotland. Since the Scottish labor market conditions decline, their study is influenced by these conditions. In year 2009 Scottish economy gets out of recession period, but labor market conditions did not improve. The results of this paper concluded that the output and unemployment relationship differs between urban economy and rural economy. From the study it was clear that in urban areas exist a strong relationship between growth and employment level.

Furthermore, a study is done in Italy regarding the relationship between inflation and unemployment rate by Lui (2009). This research is done in circumstances where inflation rate has different results on people that are unemployed and employed people. In this analysis the data used are taken from an Italian Survey done in 2004, and in this study is included only labor force. For this research is used linear regression method and general equilibrium. The findings explain that the inflation and unemployment rate relationship is either positive or negative which depends on the institutions of labor market and goods.

When the inflation rate is high, the incentive of labors to work increases but on the unemployment has negative impact. On the other side, firm's returns are decreased by inflation, so the jobs offered in this firm decreases. So unemployment rate increases.

In Japan is done a study regarding output-inflation trade-off by De Vierman (2007) using the New Keynesian Phillips Curve (NKPC) framework. The research is for the period 1998-2002. The findings show that deflation is not caused by the large negative output

gap, as it is expected by NKPC.

For period between 1960 and 2004 Kitov.I (2006) investigated the rate of inflation in USA. The variables used in this research are inflation, change in labor and unemployment level. Philips Curve is used in this research to explore the impact of inflation

The results conclude that population is an important tool in order to estimate the long term behavior of changes in labor force. Economic growth and inflation are independent and are determined by different forces related to population.

A research is done for the new European Union member states regarding the relationship between inflation level and unemployment rate. This study is done by Pallis (2006). The frequency of data in this study is annually, and the data are from 1994 to 2005. These data referred to the 10 new EU member states. For this research are used three variables: price deflator of GDP at market prices, nominal compensation per employee, and total rate of employment in percentage. In this paper non-linear least square method of estimations and E-views techniques are used. The finding of the research concludes that we cannot apply the same policies across economy, because these policies may have different effect on inflation and unemployment level.

Ortansa (2014) examined inflation level and unemployment rate relationship. This research is done for young individuals in Romania, who were between 20 and 24 year old. On the collected data Phillips curve is used for analyzing. The findings of this study conclude that inflation level and unemployment rate relationship was not either direct or reverse amongst the young citizens in Romania. But, a reverse relationship between inflation and unemployment is found in some years of the study.

There are some empirical studies such as Cascio (2001) regarding 11 European countries, Orphanides and Williams (2002) and Ravn and Simonelli (2006) for the US, Dajvire and Riobon (2003) for Israel, examine monetary policy shocks and total unemployment rate relationship. The finding of this research is that when monetary policy is tight or fixed, unemployment level increases.

There are some studies regarding the impacts of fiscal policies on output level, employment level and wages within a small open economy. In their research, Agenor Pierre and Aizenman (1999) argue that if fiscal policies are expansionary, tend to increase unemployment rate.

But, Alexius and Holmlund (2007) argue that monetary policies have more determined effects on unemployment level than the fiscal policies and foreign demand, regarding the country they did the research, Sweden.

Researchers like, Carlino and DeFina (1998) explore the chance that monetary policy may have different effects among the regions in the United States (US). Monetary policy can have different effects because of the moment in time and the magnitudes of economic growth. The findings of this research showed that regions are affected differently by monetary policy. Algan (2002) established in USA and France that a positive demand shock could decrease the unemployment rate permanently. Also, Blackley (1991), Freeman (2000), Izraeli and Murphy (2003) and Bisbing and Patron (2005) argue that the relationship between output and unemployment differs amongst demographic groups between and within the regions in the United States (US).

Regarding the trade and unemployment relationship, there are many theoretical models that analyze the impact of trade in the unemployment rate. Yet there is no consensus on whether trade and unemployment are directly or indirectly related to each other. General intuition is negative relationship between trade and the unemployment rate. This means if trade increases, the unemployment rate decreases.

DUTT and Ranjan (2009) argue that trade openness that improves labor productivity, will decrease unemployment rate. Also, other scholars, Felbermayr, Prat, and Schmerer (2011) argue that trade liberalization can reduce the level of unemployment as long as it improves aggregate productivity.

Also, another researcher, Matuz (1996) agrees that the productivity of the economy is improved by trade. This leads to the reduction of the unemployment rate. By the increasing of trade, more labor force is demanded, which results in the reduction of the unemployment rate.

Contrary with Matusz, Helpman and Itskhoki (2010) conclude that unemployment level increases by lowering trade barriers. When trade barriers are reduced, the profitability of exporting firms is increased, resulting in the growth of the trading sector. When labor force reallocate in the exporting sector, the level of unemployment will increase.

Sener (200) and Moore and Ranjan (2005) argue that liberalization of trade leads to an increase in the rate of unemployment of workers that are unskilled, but theoretically has unclear effects on total unemployment. From this research is concluded that trade liberalization increases the profitability of innovation activity by raising the profit margin of the exporting firms.

Regarding the European unemployment rate there is a theoretical study by Davis (1998). This study is one of the earliest, which analyzes the relationship between trade and unemployment rate. David says that European unemployment rate is increased significantly by the opening of international trade. This happens because Europe is engaged to maintain the minimum wage.

2.3 Unemployment in Developing Countries

This section explains the most important macroeconomic variables that affected the unemployment rate in different developing economies.

Some scholars argue that the growth-unemployment relation comes through Okun's law. This law states indirectly relation between output level and unemployment rate.

The scholars, Noor.Nor and Ghani (2007) studied the output and unemployment rate relationship for the period 1970-2004. In this research is a used Augmented Dickey Fuller (ADF) and Phillip-Perron (PP) test to check the stationarity of the data. Also they used granger causality tests to analyze the two-way causality. Their findings in this study conclude that between unemployment level and output growth exists a negative relationship. Also from the granger causality test in this research is said to be a two-way causality of GDP and unemployment rate in the economy of Malaysia.

Irfan (2010) did a research in some Asian countries. He aimed to check the validity of Okun's law. He uses data annually from the year 1980 to 2006. The findings show that between output level and unemployment rate the inverse relation was not valid in some developing countries of Asia.

Two researchers, Meidani and Zabihi (2011) study unemployment rate effect on real GDP per capita in Iran. This study tends to examine the relation between level of output and rate of unemployment. They used Auto-regressive Distribution lag (ARDL), for the period 1971-2006. The finding of this paper shows that the rate of unemployment is statistically significant in determining real GDP per person in the long-run period. Also from this study is concluded that unemployment rate and real GDP are positively related in both terms (short-run and long-run)

Regarding the validity of Okun's law there is a done a research in four Arabic countries like: Algeria, Egypt, Morocco and Tunisia. In this research, Moosa (2008) investigated that Okun's coefficient was statistically insignificant for these Arabic countries. So, the output growth in these countries does not increase employment level.

Regarding the macroeconomic variables which may affect the unemployment rate, a research is done for Turkey by Tunah (2010). In this study he uses quarterly data for the period 2000-2008. He uses PP test and ADF test to investigate the stationarity of the selected data. Also he uses

Johanse's cointegration and granger causality tests are used for empirical analysis. The findings of this study concluded that unemployment rate is significantly affected by real GDP, consumer price index (CPI) and previous unemployment rate. Also in this study is concluded that real effective exchange rate has no effect on the rate of unemployment for this period.

In his study, Shahid (2014) investigated the impact of the rate of inflation and rate of unemployment on economic growth of Pakistan. The data used in this study are taken from the World Bank for the period 1980-2010. As dependent variable is economic growth of Pakistan. Inflation rate and unemployment rate are the variables which are as independent for this research. From the unit root test table it was clear that all the variables used in this study are stationary in their levels. Also it is said that an appropriate education system and political stability could increase economic growth and reduced unemployment level.

Moreover, El-Agrody (2010) investigated the effect that unemployment rate has on GDP of Egypt. The data of this research are for the period 1194-2004. He uses the data like: privatization, population, consumption expenditure, interest rates, exchange rates, technology, agricultural domestic product, real wage rates and agricultural investment. For the analysis simple and multiple linear regression analysis are used. The results of this paper concluded that there is a positive significant impact of national investment,

national unemployment, exchange rate, and average per capita share of GDP on the volume of GDP. Also the findings showed that unemployment rate increases due to privatization and population. The researchers recommended that policies of privatization should be revised and to lower interest rates in order to reduce the rate of agriculture unemployment.

A study in Nigeria is done to examine the effect of economic growth on the rate of unemployment and the poverty of the country. Osinubi (2005) aims to examine the relationship between economic growth, rate of unemployment and poverty. He used annual time series data for the period of thirty years (1970-2000). Index of agriculture production, index of petroleum production, unemployment, inflation, money supply, exchange rate, and changes in real GDP, saving, work stoppages and trade disputes are used for this research. The findings of this research showed that economic growth and poverty are negatively related, while economic growth and unemployment are positively related.

2.4 Western Balkan Countries

Since the Western Balkan economy is a region with low employment rate and high unemployment this section provides some researches regarding the macroeconomic indicators that affect the unemployment rate. According to public opinion surveys, high unemployment is the most crucial challenge that this region is facing. Even during periods of significant economic growth, employment level improves by small percentage. The high unemployment rate of this region during the years is as the consequence of transition and restructuring. But employment rate has an important role in order to achieve economic growth in the developing countries.

In Macedonia the most important socio-economic problem for a long time is the high rate of unemployment. Mostly, this problem has been inherited from the time when Macedonia was part of former Yugoslavia. Analyzing the rate of unemployment in Macedonia should be considered the fact that a large part of the population are working

in informal sector and as consequence they resulted as unemployed people. Gray market in Macedonia is estimated around 40 percent of the GDP of the country Nenovski (2008).

2.5 Overall Summary

To summarize, it is important to say that unemployment rate has impact on the economies of these countries, let them be developed or developing ones. The pace and the size of that impact depends on countries specific characteristics. For different countries, different macroeconomics variables have much impact on the unemployment rate.

CHAPTER 3

DATA AND METHODOLOGY

3.1 Data

This research is a quantitative study that explores the impact of the macroeconomic factors on the unemployment rate in Western Balkan countries candidate to EU. The countries that are included in this study are: Albania, Bosnia and Herzegovina, Macedonia, Montenegro and Serbia.

The data provided for the selected macroeconomic factors are yearly and are for the period 2000-2015. The data for this study are taken from official sources like World Bank and International Monetary Fund (IMF).

Data used in this paper are as follows:

1. Unemployment: growth rate of total unemployment as percentage of labor force.
2. Trade: reflects the annual growth rate of the trade as percentage of GDP.
3. CPI: reflects changes in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly as in this study.

4. GDP: reflects the annual percentage of GDP growth
5. Exchange Rate: corresponds to the growth rate of exchange rate of the domestic currency of each corresponding country with US dollar. Data are yearly.
6. Interest Rate: reflects the real interest rate in percentage. Data are yearly.

3.2 Methodology

In this research will perform the vector auto-regression model (VAR) and Granger Causality test in order to analyze the impact of macroeconomic variables on unemployment in the Southeast Europe countries. For this sample of countries panel data is used and the behavior of countries is observed across time.

3.2.1 Vector Autoregressive Model (VAR)

The AR model involves one dependent variable, which depended only on legs of itself (and possible a deterministic trend). A VAR has more than one dependent variable and has more than one equation. Each equation uses its explanatory variables lags of all the variables under study (and possible a deterministic trend).

Vector Autoregressive models were firstly used by Sims (1980) instead of multivariate equations for macroeconomic analysis. He stated that these models would be appropriate only for stationary variables without time trend. However, these models are able to capture even variables exhibiting stochastic trend (Engle & Granger, 1987).

3.2.1 VAR Equations

$$\begin{aligned}
UN = & \alpha_1 + \delta_{11}UN_{t-1} + \delta_{12}UN_{t-2} + \delta_{13}UN_{t-3} + \delta_{14}UN_{t-4} + \theta_{11}TRADE_{t-1} + \theta_{12}TRADE_{t-2} \\
& + \theta_{13}TRADE_{t-3} + \theta_{14}TRADE_{t-4} + \omega_{11}CPI_{t-1} + \omega_{12}CPI_{t-2} + \omega_{13}CPI_{t-3} \\
& + \omega_{14}CPI_{t-4} + \delta_{11}GDP_{t-1} + \delta_{12}GDP_{t-2} + \delta_{13}GDP_{t-3} + \delta_{14}GDP_{t-4} \\
& + \gamma_{11}EXCH_{t-1} + \gamma_{12}EXCH_{t-2} + \gamma_{13}EXCH_{t-3} + \gamma_{14}EXCH_{t-4} + \varepsilon_{11}POP_{t-1} \\
& + \varepsilon_{12}POP_{t-2} + \varepsilon_{13}POP_{t-3} + \varepsilon_{14}POP_{t-4} + \varphi_{11}INT_{t-1} + \varphi_{12}INT_{t-2} \\
& + \varphi_{13}INT_{t-3} + \varphi_{14}INT_{t-4}
\end{aligned} \tag{3.1}$$

$$\begin{aligned}
TRADE = & \alpha_2 + \delta_{21}UN_{t-1} + \delta_{22}UN_{t-2} + \delta_{23}UN_{t-3} + \delta_{24}UN_{t-4} + \theta_{21}TRADE_{t-1} \\
& + \theta_{22}TRADE_{t-2} + \theta_{23}TRADE_{t-3} + \theta_{24}TRADE_{t-4} + \omega_{21}CPI_{t-1} + \omega_{22}CPI_{t-2} \\
& + \omega_{23}CPI_{t-3} + \omega_{24}CPI_{t-4} + \delta_{21}GDP_{t-1} + \delta_{22}GDP_{t-2} + \delta_{23}GDP_{t-3} \\
& + \delta_{24}GDP_{t-4} + \gamma_{21}EXCH_{t-1} + \gamma_{22}EXCH_{t-2} + \gamma_{23}EXCH_{t-3} + \gamma_{24}EXCH_{t-4} \\
& + \varepsilon_{21}POP_{t-1} + \varepsilon_{22}POP_{t-2} + \varepsilon_{23}POP_{t-3} + \varepsilon_{24}POP_{t-4} + \varphi_{21}INT_{t-1} \\
& + \varphi_{22}INT_{t-2} + \varphi_{23}INT_{t-3} + \varphi_{24}INT_{t-4}
\end{aligned} \tag{3.2}$$

$$\begin{aligned}
CPI = & \alpha_3 + \delta_{31}UN_{t-1} + \delta_{32}UN_{t-2} + \delta_{33}UN_{t-3} + \delta_{34}UN_{t-4} + \theta_{31}TRADE_{t-1} \\
& + \theta_{32}TRADE_{t-2} + \theta_{33}TRADE_{t-3} + \theta_{34}TRADE_{t-4} + \omega_{31}CPI_{t-1} + \omega_{32}CPI_{t-2} \\
& + \omega_{33}CPI_{t-3} + \omega_{34}CPI_{t-4} + \delta_{31}GDP_{t-1} + \delta_{32}GDP_{t-2} + \delta_{33}GDP_{t-3} \\
& + \delta_{34}GDP_{t-4} + \gamma_{31}EXCH_{t-1} + \gamma_{32}EXCH_{t-2} + \gamma_{33}EXCH_{t-3} + \gamma_{34}EXCH_{t-4} \\
& + \varepsilon_{31}POP_{t-1} + \varepsilon_{32}POP_{t-2} + \varepsilon_{33}POP_{t-3} + \varepsilon_{34}POP_{t-4} + \varphi_{31}INT_{t-1} \\
& + \varphi_{32}INT_{t-2} + \varphi_{33}INT_{t-3} + \varphi_{34}INT_{t-4}
\end{aligned} \tag{3.3}$$

$$\begin{aligned}
GDP = & \alpha_4 + \delta_{41}UN_{t-1} + \delta_{42}UN_{t-2} + \delta_{43}UN_{t-3} + \delta_{44}UN_{t-4} + \theta_{41}TRADE_{t-1} \\
& + \theta_{42}TRADE_{t-2} + \theta_{43}TRADE_{t-3} + \theta_{44}TRADE_{t-4} + \omega_{41}CPI_{t-1} + \omega_{42}CPI_{t-2} \\
& + \omega_{43}CPI_{t-3} + \omega_{44}CPI_{t-4} + \delta_{41}GDP_{t-1} + \delta_{42}GDP_{t-2} + \delta_{43}GDP_{t-3} \\
& + \delta_{44}GDP_{t-4} + \gamma_{41}EXCH_{t-1} + \gamma_{42}EXCH_{t-2} + \gamma_{43}EXCH_{t-3} + \gamma_{44}EXCH_{t-4} \\
& + \varepsilon_{41}POP_{t-1} + \varepsilon_{42}POP_{t-2} + \varepsilon_{43}POP_{t-3} + \varepsilon_{44}POP_{t-4} + \varphi_{41}INT_{t-1} \\
& + \varphi_{42}INT_{t-2} + \varphi_{43}INT_{t-3} + \varphi_{44}INT_{t-4}
\end{aligned} \tag{3.4}$$

$$\begin{aligned}
EXCH = & \alpha_5 + \delta_{51}UN_{t-1} + \delta_{52}UN_{t-2} + \delta_{53}UN_{t-3} + \delta_{54}UN_{t-4} + \theta_{51}TRADE_{t-1} \\
& + \theta_{52}TRADE_{t-2} + \theta_{53}TRADE_{t-3} + \theta_{54}TRADE_{t-4} + \omega_{51}CPI_{t-1} + \omega_{52}CPI_{t-2} \\
& + \omega_{53}CPI_{t-3} + \omega_{54}CPI_{t-4} + \delta_{51}GDP_{t-1} + \delta_{52}GDP_{t-2} + \delta_{53}GDP_{t-3} \\
& + \delta_{54}GDP_{t-4} + \gamma_{51}EXCH_{t-1} + \gamma_{52}EXCH_{t-2} + \gamma_{53}EXCH_{t-3} + \gamma_{54}EXCH_{t-4} \\
& + \varepsilon_{51}POP_{t-1} + \varepsilon_{52}POP_{t-2} + \varepsilon_{53}POP_{t-3} + \varepsilon_{54}POP_{t-4} + \varphi_{51}INT_{t-1} \\
& + \varphi_{52}INT_{t-2} + \varphi_{53}INT_{t-3} + \varphi_{54}INT_{t-4}
\end{aligned} \tag{3.5}$$

$$\begin{aligned}
POP = & \alpha_6 + \delta_{61}UN_{t-1} + \delta_{62}UN_{t-2} + \delta_{63}UN_{t-3} + \delta_{64}UN_{t-4} + \theta_{61}TRADE_{t-1} \\
& + \theta_{62}TRADE_{t-2} + \theta_{63}TRADE_{t-3} + \theta_{64}TRADE_{t-4} + \omega_{61}CPI_{t-1} + \omega_{62}CPI_{t-2} \\
& + \omega_{63}CPI_{t-3} + \omega_{64}CPI_{t-4} + \delta_{61}GDP_{t-1} + \delta_{62}GDP_{t-2} + \delta_{63}GDP_{t-3} \\
& + \delta_{64}GDP_{t-4} + \gamma_{61}EXCH_{t-1} + \gamma_{62}EXCH_{t-2} + \gamma_{63}EXCH_{t-3} + \gamma_{64}EXCH_{t-4} \\
& + \varepsilon_{61}POP_{t-1} + \varepsilon_{62}POP_{t-2} + \varepsilon_{63}POP_{t-3} + \varepsilon_{64}POP_{t-4} + \varphi_{61}INT_{t-1} \\
& + \varphi_{62}INT_{t-2} + \varphi_{63}INT_{t-3} + \varphi_{64}INT_{t-4} \tag{3.6}
\end{aligned}$$

$$\begin{aligned}
INT = & \alpha_7 + \delta_{71}UN_{t-1} + \delta_{72}UN_{t-2} + \delta_{73}UN_{t-3} + \delta_{74}UN_{t-4} + \theta_{71}TRADE_{t-1} \\
& + \theta_{72}TRADE_{t-2} + \theta_{73}TRADE_{t-3} + \theta_{74}TRADE_{t-4} + \omega_{71}CPI_{t-1} + \omega_{72}CPI_{t-2} \\
& + \omega_{73}CPI_{t-3} + \omega_{74}CPI_{t-4} + \delta_{71}GDP_{t-1} + \delta_{72}GDP_{t-2} + \delta_{73}GDP_{t-3} \\
& + \delta_{74}GDP_{t-4} + \gamma_{71}EXCH_{t-1} + \gamma_{72}EXCH_{t-2} + \gamma_{73}EXCH_{t-3} + \gamma_{74}EXCH_{t-4} \\
& + \varepsilon_{71}POP_{t-1} + \varepsilon_{72}POP_{t-2} + \varepsilon_{73}POP_{t-3} + \varepsilon_{74}POP_{t-4} + \varphi_{71}INT_{t-1} \\
& + \varphi_{72}INT_{t-2} + \varphi_{73}INT_{t-3} + \varphi_{74}INT_{t-4} \tag{3.7}
\end{aligned}$$

In addition to an intercept each equation contains 4 lags of all variables in study.

The selected macroeconomic variables in the VAR are stationary. Estimation and testing can be carried out by using OLS. P-values or t-statistics help to examine whether individual coefficients are significant.

The reasons to use VAR are:

- It is easy to use
- It provides a framework for testing for Granger causality between each set of variables

In the VAR model, the explanatory variables might influence the dependent variable, but there is no possibility that the dependent variable influences the explanatory variables.

One of the drawback in VARs is they are not theoretical which are not based on economic theory. There is a theory in selecting the variables for the VAR.

3.2 Granger Causality Tests

If event A happens before event B, than it is possible that A is causing B. In other words, events in the past can cause events to happen today. Future event cannot cause past events.

Causality concern is examined by Granger causality (Granger, 1996). The basic idea is that a variable x Granger causes y if past values of x can help explain y . Of course, if Granger causality holds this does not guarantee that x causes y . Nevertheless, if past values of x have explanatory power for current values of y , it at least suggests that x might be causing y .

The equations for each variable are in the VAR model section, equation (3.1) to the equation (3.7)

CHAPTER 4

EMPIRICAL STUDY

In this chapter is included the empirical analysis for Western Balkan countries regarding the selected macroeconomic variables for this paper. To analyze which of the variables has significant impact on the unemployment rate and to study the impact of unemployment rate on the macroeconomic variables.

4.1 Graphical Analysis

In this section the variables of this study are presented in graphs. For each variable, a graph is provided regarding the five countries that are included in this study.

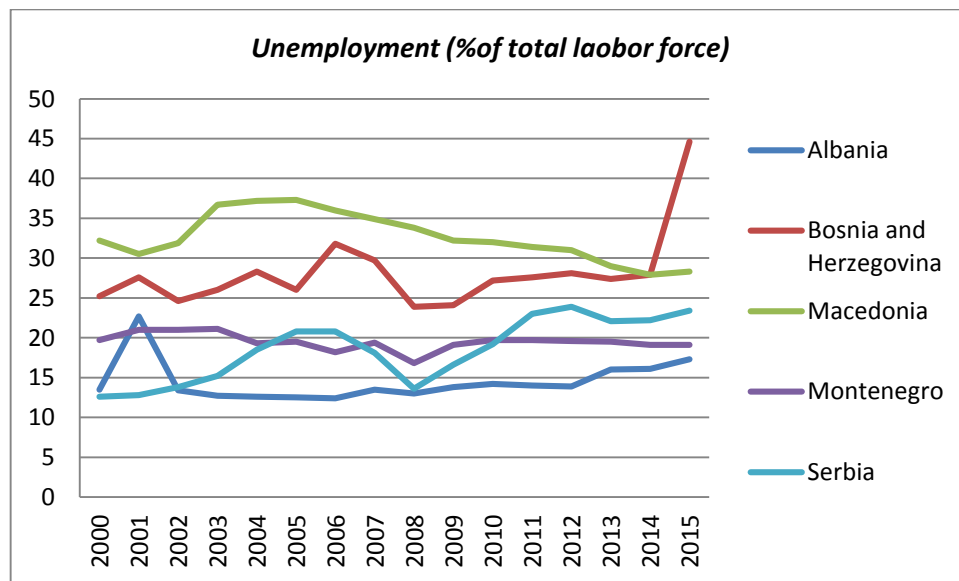


FIGURE 4.1 Unemployment over years

As it is seen from the graph, Montenegro has a stable unemployment rate for this period of study. Regarding Bosnia and Herzegovina trends on unemployment are clear. In 2015 it reaches the highest unemployment rate (45%). Albania and Montenegro unemployment trends seem to be stable for this period, not varying too much. For the period 2000-2003 unemployment rate of Serbia is stable, then it faces an increasing trend expect the year 2008.

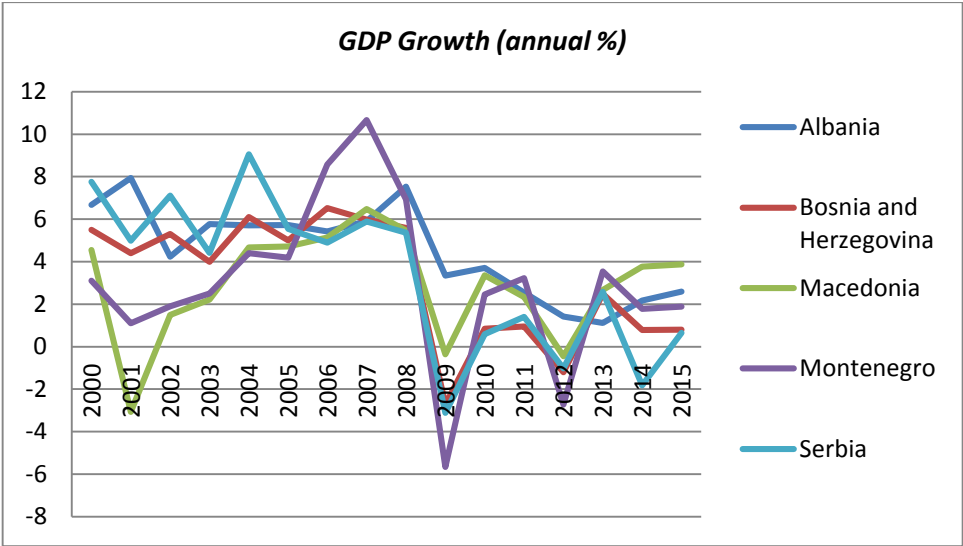


FIGURE 4.2 GDP Growth over year

The reasons of high unemployment are many, but the most important is the financial crisis that affects the whole economy. As result all countries fall into recession in year 2009, expect Albania that could maintain positive economic growth.

Regarding the analysis of GDP growth for the sample of countries that this thesis studies, it is obvious that Montenegro’s GDP growth varies too much from 2000 to 2015. In 2009 Montenegro faces the minimum growth that is -6 %. Also the growth of Serbia, Bosnia and Herzegovina and Macedonia fluctuate much for this period. Referring to this graph only Albania’s growth seems to be more stable from year to year.

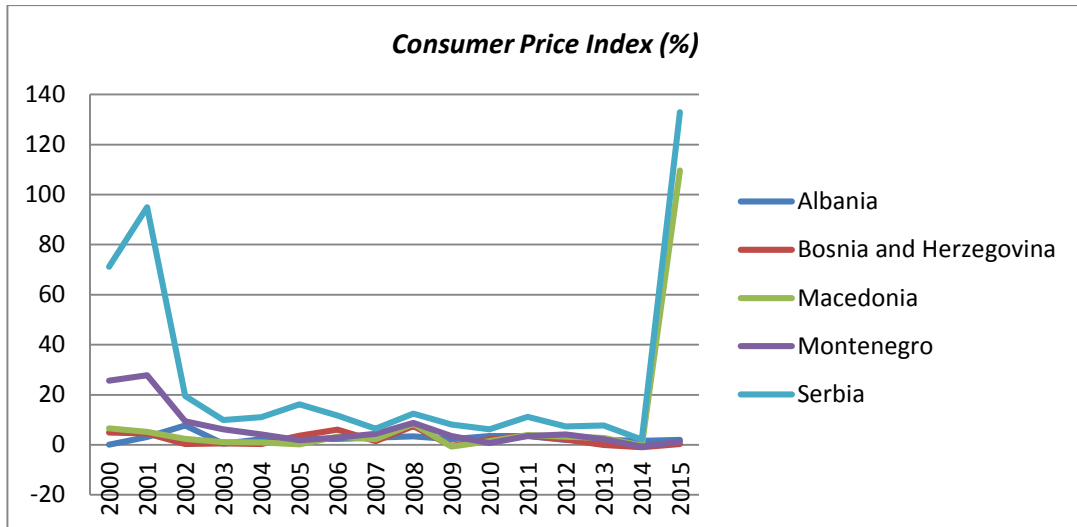


FIGURE 4.3 Consumer Price Index over year

Referring figure 4.3 the inflation rate of Montenegro, Macedonia and Bosnia and Herzegovina do not vary too much from year to year for this period of study. Regarding the inflation rate in Serbia, it faces a sharp decrease in 2002 and then seems not too much fluctuating, but in 2015 it faces a sharp increase. Macedonia seems to have a stable inflation rate for the period 2000-2014, but in 2015 the inflation rate increased sharply.

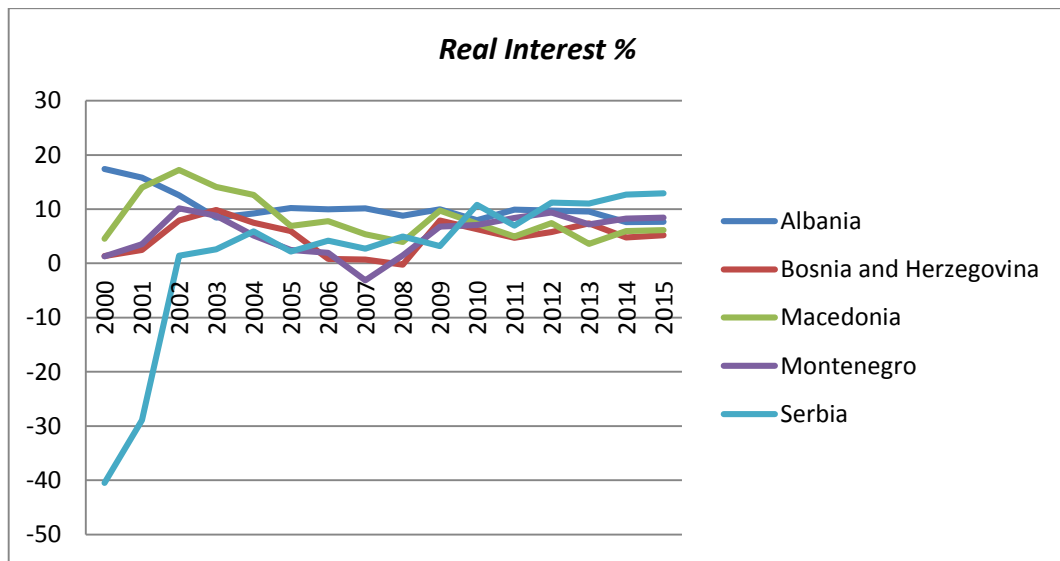


FIGURE 4.4 Real Interest Rate over year

Referring Figure 4.4 after 2014 the interest rate of this sample of countries seems to be more stable. During 2000-2014 the interest rate of these countries volatiles too much.

It is clear that the country with the highest interest rate volatility is Serbia. On the other hand Albania and Macedonia seem to be more stable. If we were to compare Serbia interest rates with interest rate of Macedonia, we could say that they move opposite to each other. Interest rates of Bosnia and Herzegovina have been relatively stable for the period of the study.

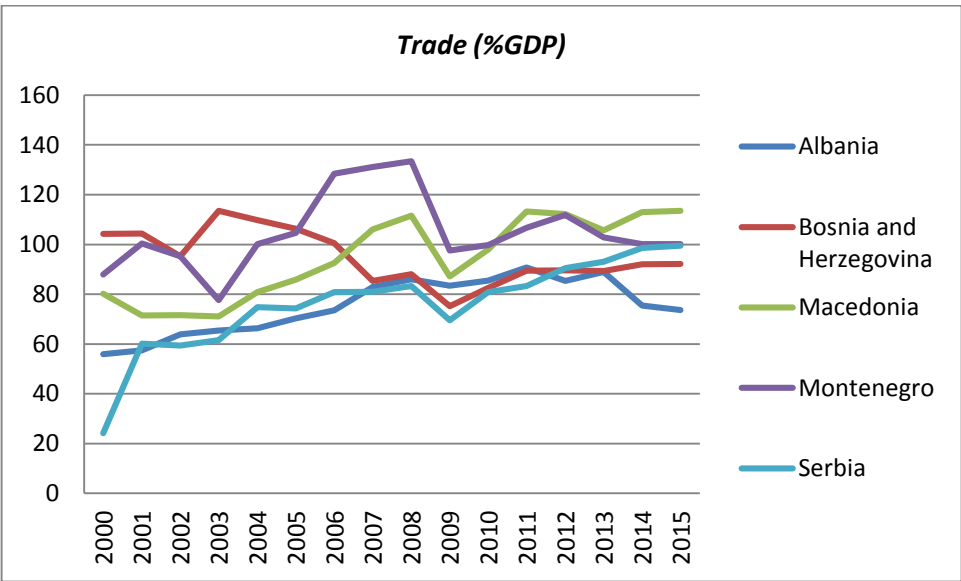


FIGURE 4.5 Annual Growth Rate of Trade

Referring to the Figure 4.5 it is clear that in year 2009 the trade of these countries declines, and this happened as the consequence of financial crisis in 2007-2008.

Albania, Macedonia and Serbia are increasing the trade levels from 2000 to 2015. Regarding Bosnia and Herzegovina, for a period of 2003-2009 the trade is decreasing continuously. The trade level for the period of study in Montenegro varies too much from year to year.

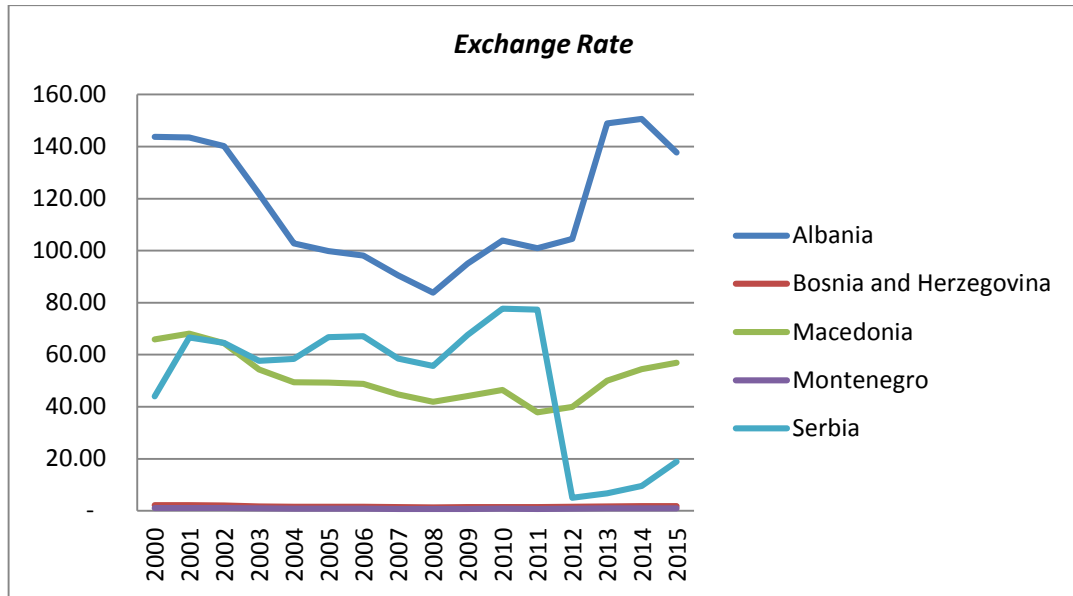


FIGURE 4.6 Exchange Rate over years

Referring the Figure 4.6 for the exchange rate of the countries, Montenegro and Bosnia and Herzegovina's domestic currency nor appreciate; neither depreciate against US dollar for the period 2000-2015.

4.2 Unit Root Test

This section represents the unit root test for stationarity of the data used in this thesis.

Unit root test is employed and the results are reported in Table 4.1. The following table represents the results of the stationarity test of the data conducted by two tests the ADF and PP.

The results indicate that all selected macroeconomic variables are stationary in their levels.

TABLE 4.1 Unit Root Test Result

| Variables | ADF | PP |
|------------------|------------|-----------|
| | Level | Level |
| Unemployment | 0.0001* | 0.0000* |
| Trade | 0.0069* | 0.0000* |
| CPI | 0.0000* | 0.0000* |
| GDP | 0.0602 | 0.0001* |
| Exchange Rate | 0.0228* | 0.0091* |
| Interest Rate | 0.0000* | 0.0001* |

** Indicates significant at 5% significance level*

4.3 VAR Model Results

TABLE 4.2 VAR Model Result Table for Interest Rate

| | UN | TRADE | CPI | GDP | EXCH | INT |
|---------|--|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| INT(-1) | 1.407521 -0.75922 [1.85390] | -0.0884 -0.48565 [-0.18202] | 0.581133 -1.14809 [0.50618] | -4.2158 -18.081 [-0.23316] | -11.1717 -13.6641 [-0.81759] | 0.662015 -0.16728 [3.95752] |
| INT(-2) | -0.21247 -0.96052 [-0.22121] | 1.684014 -0.61441 [2.74086] | -0.32957 -1.45249 [-0.22690] | -18.8722 -22.875 [-0.82501] | -5.54929 -17.287 [-0.32101] | 0.182482 -0.21163 [0.86225] |
| INT(-3) | -0.11775 -1.0023 [-0.11748] | -1.17666 -0.64113 [-1.83527] | 0.649986 -1.51566 [0.42885] | 34.31634 -23.8699 [1.43764] | 28.69049 -18.0388 [1.59048] | -0.17395 -0.22084 [-0.78766] |
| INT(-4) | -0.49362 -0.74425 [-0.66325] | 0.845099 -0.47607 [1.77516] | -0.88452 -1.12545 [-0.78593] | -23.5616 -17.7244 [-1.32933] | -24.0026 -13.3946 [-1.79196] | 0.006801 -0.16398 [0.04148] |

As it has been stated above, the objective of this thesis is to examine the impact of macroeconomic indicators on unemployment of Western Balkan countries. Based on this objective, the following analysis will be made.

The results show that for this sample of countries, from all the macroeconomic indicators only interest rate has a significant impact on unemployment. This effect is statistically significant and positive at 10% level. Since interest rate has positive effect, means that if interest rate decreases, unemployment will decrease too.

TABLE 4.3 VAR Model Result Table for Unemployment

| | UN | TRADE | CPI | GDP | EXCH | INT |
|--------|------------|------------|------------|-------------------|------------|------------|
| UN(-1) | -0.03169 | -0.06914 | -0.22239 | 2.453895 | -3.62127 | 0.000635 |
| | -0.23502 | -0.15034 | -0.3554 | -5.59714 | -4.22985 | -0.05178 |
| | [-0.13484] | [-0.45991] | [-0.62574] | [0.43842] | [-0.85612] | [0.01226] |
| UN(-2) | -0.28219 | -0.01264 | -0.22174 | -11.5365 | -4.79971 | -0.02956 |
| | -0.19684 | -0.12591 | -0.29766 | -4.68772 | -3.54258 | -0.04337 |
| | [-1.43363] | [-0.10040] | [-0.74496] | [-2.46101] | [-1.35486] | [-0.68151] |
| UN(-3) | -0.06614 | -0.10551 | 0.046683 | -1.10358 | -1.75092 | -0.02658 |
| | -0.14699 | -0.09403 | -0.22228 | -3.50065 | -2.64549 | -0.03239 |
| | [-0.44997] | [-1.12214] | [0.21002] | [-0.31525] | [-0.66185] | [-0.82062] |
| UN(-4) | -0.08712 | -0.00949 | -0.09866 | -2.05399 | 1.061491 | -0.01481 |
| | -0.13535 | -0.08658 | -0.20467 | -3.22335 | -2.43594 | -0.02982 |
| | [-0.64365] | [-0.10960] | [-0.48204] | [-0.63722] | [0.43576] | [-0.49677] |

This table shows the impact of unemployment on the selected macroeconomic indicators for this thesis. It is clear that unemployment has impact on GDP. This effect is statistically significant and negative for this sample of countries. It is statistically significant at 1% level. This impact means that if unemployment decreases, the GDP will increase.

TABLE 4.4 VAR Model Result Table for CPI

| | UN | TRADE | CPI | GDP | EXCH | INT |
|---------|------------|------------|------------|-------------------|------------|------------|
| CPI(-1) | 0.868693 | -2.06764 | -0.91892 | 45.10889 | -16.8895 | 0.371871 |
| | -0.69547 | -0.44487 | -1.05169 | -16.5628 | -12.5168 | -0.15323 |
| | [1.24907] | [-4.64775] | [-0.87376] | [2.72350] | [-1.34935] | [2.42681] |
| CPI(-2) | -1.02927 | 1.524775 | -0.2479 | -17.5678 | 10.37997 | -0.07331 |
| | -0.90112 | -0.57641 | -1.36267 | -21.4603 | -16.2179 | -0.19855 |
| | [-1.14221] | [2.64527] | [-0.18192] | [-0.81862] | [0.64003] | [-0.36923] |
| CPI(-3) | -0.60178 | 0.365191 | 1.833916 | 5.975114 | -8.38448 | 0.027353 |
| | -0.94521 | -0.60462 | -1.42933 | -22.5103 | -17.0114 | -0.20826 |
| | [-0.63667] | [0.60400] | [1.28306] | [0.26544] | [-0.49287] | [0.13134] |
| CPI(-4) | 0.256372 | 0.827199 | 0.017653 | -16.6982 | -6.37764 | -0.18171 |

In order to extend the analysis, this table shows which macroeconomic indicators are affected by Consumer Price Index (CPI)

CPI has a significant effect on GDP. This effect is statistically significant and positive for this sample of countries. It is statistically significant at 10% level where t-value equals 2.04020. This means higher CPI brings higher GDP.

4.4 Granger Causality Test Results

TABLE 4.5 Granger Causality Test for interest rate and unemployment

| Null Hypothesis: | Obs. | F-statistic | Prob. |
|--------------------------------|------|-------------|---------------|
| INT does not Granger Cause DUN | 55 | 2.20148 | 0.0836 |
| DUN does not Granger Cause INT | | 0.29571 | 0.8793 |

Granger causality analysis has been performed to observe the causal relationship among variables. The results of Granger causality are represented in the table.

Table above shows the results of the Granger Causality for Southeast European countries.

For the null hypothesis that “interest does not Granger Cause unemployment” the p-value is equal to 0.0836. Since the probability that represents the error is approximately zero, this hypothesis is rejected at 10% significant level. So it means that interest rate Granger Cause unemployment. In the other words, interest rate does impact unemployment.

So the result in VAR model corresponds with the result in Granger Causality test.

TABLE 4.6 Granger Causality Test for GDP and CPI

| Null Hypothesis: | Obs. | F-statistic | Prob. |
|---------------------------------|------|-------------|---------------|
| DGDP does not Granger Cause CPI | 55 | 1.06663 | 0.3839 |
| CPI does not Granger Cause DGDP | | 2.10775 | 0.0951 |

For the null hypothesis that “CPI does not Granger Cause DGDP” the p-value is equal to 0.0951. Since the probability that represents the error is approximately zero, this hypothesis is rejected at 10% significance level. So it means that CPI Granger Cause GDP. High inflation brings high GDP.

CHAPTER 5

CONCLUSION

5.1 Overall Results

The aim of this thesis is to study the macroeconomic indicators that impact unemployment in the Western Balkan countries. The results of VAR model showed that for this sample of countries from all selected macroeconomic indicators only interest rate significantly affects the unemployment rate. Since the interest rate is a monetary policy defined by the central bank of each country, it can be a tool to reduce unemployment. By reducing interest rate of a country, investments will increase, production increases, and companies acquired more workers since their production increases.

On the other hand, the results of VAR model regarding the impact of unemployment on the other macroeconomic indicators showed that unemployment rate has significant negative impact on GDP. It is meaningful because when unemployment rate reduces (employment increases) the GDP of the country increases.

To extend the analysis, from the VAR results, it is obviously that CPI has positive significant impact on GDP. When inflation increases, more money are circulating so the GDP of country increases.

Regarding the Granger Causality tests results, it is clear that interest rate Granger cause unemployment rate. In the other words, interest rate does impact unemployment. So the result in VAR model corresponds with the result in Granger Causality test. Also from these tests, is said that CPI Granger cause GDP. High inflation brings high GDP. Both VAR model and Granger Causality tests reveal same results.

5.2 Implications

This research has implications for policy makers of the Western Balkan Countries, what they should do in order to decrease the unemployment rate. The unemployment rate is a cost for each of the five selected countries included in this study. The government and the nation suffer when the rate of unemployment is high. With the increase of the unemployment rate other economic factors are significantly affected. This thesis research has also implications for scholars in the future. It will contribute in enriching existing literature on unemployment in Western Balkan candidates to EU.

5.3 Limitations

As almost every research, this thesis faced some limitations as well. Main limitations are listed below:

1. Lack of Sample Size: Data used in this research are annually covering the period 2000-2015. The results would more exact if there were data found monthly and for larger periods.
2. Lack of data about developing countries such as Kosovo. There is lack of information about the variables included in this study for Kosovo
3. The variables included in this research do not cover all the variables which help explain the unemployment rate in Southeast European countries.

5.4 Future Studies

The research conducted for this thesis suggests that a number of other studies can be done. Studies of this kind for all developing countries in Europe using the same variables and including more observations could be done in the future.

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APPENDIX

| YEAR | UN | GDP | CPI | INT | TRADE | POP | IMP | EXP | EXC |
|---------|------|--------------|--------------|--------------|--------------|-------|------------|-----------------|--------------------|
| June-00 | 13.5 | 6.6666 21 | 0.050 018 | 17.427 38 | 55.920 43 | 3.089 | -14.3 | - 7.088 | 143.7094166 700 |
| June-01 | 22.7 | 7.9403 31 | 3.107 588 | 15.799 38 | 57.430 36 | 3.06 | 33.18 1 | 23.04 8 | 143.4848333 300 |
| June-02 | 13.4 | 4.2313 71 | 7.770 526 | 12.590 08 | 63.934 24 | 3.051 | 6.066 | 8.253 | 140.1545158 700 |
| June-03 | 12.7 | 5.7734 91 | 0.484 003 | 8.4372 1 | 65.440 62 | 3.04 | 7.733 | 25.15 | 121.8632500 000 |
| June-04 | 12.6 | 5.7095 57 | 2.280 019 | 9.1878 72 | 66.357 83 | 3.027 | 21.06 7 | 24.01 3 | 102.7800512 000 |
| June-05 | 12.5 | 5.7208 2 | 2.366 582 | 10.186 98 | 70.295 3 | 3.011 | 9.912 | 2.948 | 99.87025448 10 |
| June-06 | 12.4 | 5.4310 13 | 2.370 728 | 9.9749 64 | 73.455 05 | 2.993 | 6.648 | 5.163 | 98.10337709 10 |
| June-07 | 13.5 | 5.9 | 2.932 682 | 10.160 08 | 82.872 42 | 2.97 | 22.06 8 | 20.91 1 | 90.42789383 10 |
| June-08 | 13 | 7.53 | 3.359 242 | 8.8216 71 | 86.027 37 | 2.947 | 10.25 2 | 11.17 5 | 83.89460410 10 |
| June-09 | 13.8 | 3.35 | 2.280 502 | 9.9961 31 | 83.359 56 | 2.928 | -2.31 | - 11.28 8 | 94.97811982 00 |
| June-10 | 14.2 | 3.71 | 3.552 267 | 7.9743 04 | 85.464 56 | 2.913 | - 8.815 | 30.34 1 | 103.9364433 500 |
| June-11 | 14 | 2.55 | 3.450 347 | 9.8933 41 | 90.762 86 | 2.905 | 3.198 | 8.344 | 100.8949547 300 |
| June-12 | 13.9 | 1.42 | 2.031 596 | 9.7391 03 | 85.338 51 | 2.9 | - 5.597 | 5.966 | 104.4989166 700 |
| June-13 | 16 | 1.11 | 1.937 618 | 9.5867 44 | 88.929 61 | 2.897 | - 0.154 | 17.41 2 | 148.9329166 700 |
| June-14 | 16.1 | 2.17 | 1.634 033 | 7.5920 96 | 75.503 36 | 2.894 | - 7.094 | - 44.60 4 | 150.6333333 300 |
| June-15 | 17.3 | 2.6 | 1.965 | 7.6875 | 73.602 2 | 2.889 | - 3.204 | - 4.886 | 137.6905833 300 |
| June-00 | 25.2 | 5.5 | 4.973 | 1.3276 36 | 104.19 06 | 3.781 | - 7.455 | 27.22 4 | 2.122859511 90 |
| June-01 | 27.6 | 4.4 | 4.573 | 2.456 | 104.31 89 | 3.798 | 10.13 6 | 3.261 | 2.185659583 30 |
| June-02 | 24.6 | 5.3 | 0.313 | 7.8825 63 | 95.276 77 | 3.828 | 3.864 | - 4.913 | 2.078170426 20 |

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|---------|------|------------------|------------------|------------------|--------------|-------|-----------------|-----------------|-------------------|
| June-03 | 26 | 4 | 0.547 | 9.8675 85 | 113.45 78 | 3.858 | 9.196 | 17.05 4 | 1.732932204 20 |
| June-04 | 28.3 | 6.1 | 0.282 | 7.5158 24 | 109.74 01 | 3.889 | 2.515 | 18.02 2 | 1.575157028 00 |
| June-05 | 26 | 5 | 3.582 | 5.9492 33 | 106.28 76 | 3.919 | -1.63 | - 8.194 | 1.572722019 60 |
| June-06 | 31.8 | 6.5244 82 | 6.125 | 0.8391 88 | 100.49 99 | 3.92 | - 8.928 | 19.73 4 | 1.559071956 10 |
| June-07 | 29.7 | 5.9791 45 | 1.515 508 | 0.7205 59 | 85.379 19 | 3.916 | 25.63 8 | 31.71 3 | 1.429002741 60 |
| June-08 | 23.9 | 5.5936 44 | 7.416 856 | - 0.2348 1 | 88.008 67 | 3.911 | 7.191 | 14.74 5 | 1.335195680 50 |
| June-09 | 24.1 | -2.719 | - 0.390 19 | 7.9216 46 | 75.238 02 | 3.904 | - 9.745 | 3.303 | 1.407891238 40 |
| June-10 | 27.2 | 0.8420 33 | 2.188 538 | 6.2977 86 | 82.550 76 | 3.897 | - 0.636 | 19.39 7 | 1.476739568 50 |
| June-11 | 27.6 | 0.9577 63 | 3.675 | 4.7002 94 | 89.400 87 | 3.89 | 3.686 | 12.95 7 | 1.406936585 70 |
| June-12 | 28.1 | - 1.2069 4 | 2.049 674 | 5.7562 07 | 89.645 57 | 3.884 | - 4.176 | 0.473 | 1.496666666 70 |
| June-13 | 27.4 | 2.48 | - 0.086 64 | 7.3549 31 | 89.386 82 | 3.878 | 1.368 | 12.22 8 | 1.734055833 30 |
| June-14 | 27.9 | 0.7826 12 | - 0.930 23 | 4.7800 68 | 91.970 76 | 3.871 | 8.877 | 4.707 | 1.759667583 30 |
| June-15 | 44.6 | 0.8 | 0.354 | 5.2134 | 92.112 2 | 3.863 | - 0.546 | 5.149 | 1.835795384 90 |
| June-00 | 32.2 | 4.5491 36 | 6.607 423 | 4.5188 5 | 80.160 15 | 2.01 | 32.69 6 | 23.2 | 65.90386667 0 |
| June-01 | 30.5 | - 3.0672 5 | 5.198 885 | 13.971 73 | 71.477 81 | 2.016 | - 24.32 8 | - 19.36 8 | 68.03713333 0 |
| June-02 | 31.9 | 1.4940 29 | 2.314 598 | 17.256 89 | 71.533 87 | 2.022 | 15.10 3 | - 16.06 7 | 64.34979167 0 |
| June-03 | 36.7 | 2.2222 22 | 1.104 111 | 14.115 61 | 71.069 32 | 2.026 | - 5.914 | 0.336 | 54.32225833 0 |
| June-04 | 37.2 | 4.6744 28 | 0.926 819 | 12.629 04 | 80.870 13 | 2.033 | 21.56 6 | 25.98 9 | 49.40993333 0 |
| June-05 | 37.3 | 4.7233 78 | 0.163 762 | 6.8989 09 | 85.841 | 2.037 | 10.60 5 | 29.24 5 | 49.28368333 0 |
| June-06 | 36 | 5.1370 25 | 3.213 629 | 7.7858 | 92.551 67 | 2.042 | 13.09 1 | 20.13 3 | 48.80176667 0 |

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|---------|------|------------------|------------------|------------------|--------------|------------|-----------------|-----------------|-------------------|
| June-07 | 34.9 | 6.4734 87 | 2.251 758 | 5.3931 | 106.09 32 | 2.045 | 16.87 3 | 17.33 4 | 44.72981667 0 |
| June-08 | 33.8 | 5.4717 12 | 8.331 897 | 3.9736 38 | 111.57 01 | 2.049 | 6.129 | -5.99 | 41.86768333 0 |
| June-09 | 32.2 | - 0.3586 2 | - 0.739 63 | 9.7495 33 | 87.176 99 | 2.053 | - 12.41 | - 21.27 8 | 44.10057500 0 |
| June-10 | 32 | 3.3587 6 | 1.509 975 | 7.2931 86 | 97.881 07 | 2.057 | 11.47 5 | 43.23 7 | 46.48555000 0 |
| June-11 | 31.4 | 2.3398 92 | 3.904 754 | 4.9616 16 | 113.19 21 | 2.06 | 10.62 8 | 12.70 7 | 37.88175833 0 |
| June-12 | 31 | - 0.4561 8 | 3.316 056 | 7.4177 25 | 112.21 5 | 2.062 | 6.344 | 1.32 | 39.98107500 0 |
| June-13 | 29 | 2.6656 37 | 2.784 384 | 3.6277 75 | 105.69 72 | 2.066 | 1.435 | 5.994 | 50.00355000 0 |
| June-14 | 27.9 | 3.7675 58 | - 0.281 02 | 5.9315 72 | 112.95 84 | 2.069 | 13.67 7 | 19.36 | 54.46173333 0 |
| June-15 | 28.3 | 3.88 | 109.7 0 | 6.1112 | 113.45 67 | 2.073 | 2.457 | 8.231 | 56.90182833 0 |
| June-00 | 19.7 | 3.0999 97 | 25.69 | 1.3212 | 87.925 2 | 6049 50 | | | 1.085400833 30 |
| June-01 | 21 | 1.1000 01 | 27.86 | 3.5641 | 100.41 02 | 6073 89 | - 24.32 1 | - 12.45 6 | 1.117510000 00 |
| June-02 | 21 | 1.8999 99 | 9.361 | 10.123 4 | 95.247 1 | 6098 28 | - 15.45 6 | - 10.32 1 | 1.062551666 70 |
| June-03 | 21.1 | 2.4999 98 | 6.23 | 8.7894 | 77.599 83 | 6122 67 | - 11.62 1 | - 11.34 9 | 0.886034166 67 |
| June-04 | 19.3 | 4.4000 04 | 4.164 | 5.1234 | 100.10 86 | 6133 53 | 34.66 5 | 65.79 4 | 0.805365000 00 |
| June-05 | 19.5 | 4.1929 94 | 1.8 | 2.4567 | 104.62 51 | 6142 61 | 4.653 | - 4.949 | 0.804120000 00 |
| June-06 | 18.2 | 8.5662 43 | 2.924 513 | 1.9200 76 | 128.47 06 | 6150 25 | 42.06 3 | 27.12 | 0.797140833 33 |
| June-07 | 19.4 | 10.657 9 | 4.347 122 | - 3.1185 7 | 131.09 25 | 6158 75 | 38.56 5 | 7.186 | 0.730637500 00 |
| June-08 | 16.8 | 6.9225 98 | 8.758 728 | 1.4641 1 | 133.47 89 | 6169 69 | 11.99 6 | -9.07 | 0.682674711 24 |
| June-09 | 19.1 | - 5.6569 2 | 3.466 724 | 6.7949 38 | 97.539 93 | 6182 94 | - 31.72 1 | - 28.10 1 | 0.719843359 79 |
| June- | 19.7 | 2.4637 | 0.654 | 7.0527 | 99.780 | 6194 | - | 7.23 | 0.755044951 |

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|---------|------|--------------|--------------|--------------|--------------|------------|------------|------------|-------------------|
| 10 | | 32 | 947 | 67 | 33 | 28 | 3.588 | | 99 |
| June-11 | 19.7 | 3.2284 54 | 3.450 143 | 8.3831 42 | 106.65 89 | 6200 79 | 5.436 | 17.20 3 | 0.719355253 61 |
| June-12 | 19.6 | -2.7238 | 4.145 247 | 9.3688 88 | 111.76 6 | 6206 01 | - 1.379 | - 15.22 | 0.769378814 45 |
| June-13 | 19.5 | 3.5489 82 | 2.205 893 | 7.1747 32 | 102.77 09 | 6212 07 | -1.81 | 3.785 | 0.886608669 12 |
| June-14 | 19.1 | 1.7837 1 | -0.710 | 8.2903 77 | 100.12 76 | 6218 10 | 2.012 | - 10.17 | 0.899703757 48 |
| June-15 | 19.1 | 1.888 | 1.353 | 8.4321 | 100.11 21 | 6218 15 | 7.445 | - 9.277 | 0.938627275 83 |
| June-00 | 12.6 | 7.7592 09 | 71.12 063 | -40.474 | 24.170 33 | 7.516 | | | 44.02000000 0 |
| June-01 | 12.8 | 4.9927 14 | 95.00 523 | -28.928 | 60.187 19 | 7.503 | 34.14 6 | - 7.656 | 66.68059920 0 |
| June-02 | 13.8 | 7.1157 88 | 19.49 083 | 1.4158 71 | 59.370 55 | 7.5 | 28.45 1 | 13.23 1 | 64.48757840 0 |
| June-03 | 15.2 | 4.4154 14 | 9.876 179 | 2.5685 45 | 61.513 06 | 7.481 | 14.33 8 | 31.64 8 | 57.58107330 0 |
| June-04 | 18.5 | 9.0465 13 | 11.02 636 | 5.9034 9 | 74.852 72 | 7.463 | 20.99 9 | 5.726 | 58.39162010 0 |
| June-05 | 20.8 | 5.5404 27 | 16.11 998 | 2.1887 32 | 74.280 07 | 7.441 | - 13.60 | 14.44 2 | 66.72161970 0 |
| June-06 | 20.8 | 4.9043 49 | 11.72 402 | 4.1999 58 | 80.865 59 | 7.412 | 7.79 | 4.919 | 67.14581666 7 |
| June-07 | 18.1 | 5.8887 6 | 6.391 706 | 2.6908 76 | 81.027 17 | 7.382 | 26.01 4 | 17.20 5 | 58.45352500 0 |
| June-08 | 13.6 | 5.3666 83 | 12.41 099 | 4.9807 78 | 83.255 87 | 7.35 | 6.463 | 4.218 | 55.72348333 3 |
| June-09 | 16.6 | -3.1159 | 8.116 951 | 3.2151 68 | 69.591 33 | 7.321 | - 21.74 | - 8.816 | 67.58060000 0 |
| June-10 | 19.2 | 0.5844 78 | 6.142 554 | 10.786 5 | 80.854 | 7.291 | 2.906 | 16.82 5 | 77.72893333 3 |
| June-11 | 23 | 1.4014 66 | 11.13 74 | 6.9449 5 | 83.349 64 | 7.237 | 8.003 | 3.646 | 77.33300000 0 |
| June-12 | 23.9 | -1.0152 | 7.330 386 | 11.232 84 | 90.524 95 | 7.201 | 0.753 | - 0.836 | 4.942500000 |
| June-13 | 22.1 | 2.5717 34 | 7.694 264 | 11.030 15 | 93.109 67 | 7.167 | 2.684 | 21.90 9 | 6.660000000 |
| June-14 | 22.2 | -1.8127 | 2.082 448 | 12.681 63 | 98.600 35 | 7.132 | 1.93 | 1.668 | 9.580000000 |
| June-15 | 23.4 | 0.6432 | 132.9 6 | 12.943 2 | 99.456 7 | 7.132 | 5.691 | 6.716 | 18.94000000 0 |