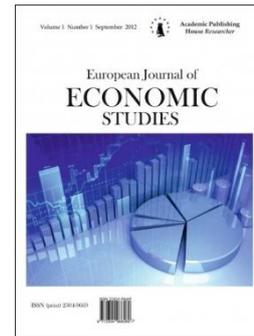


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Effect of Consumer Price Index Change on Annual Net Salary in Balkan Countries: Case of Serbia, Croatia and Bosnia

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Abstract

This research is examining the effect of Consumer Price Index (CPI) to calculate the change in Annual Net Salary (ANS), across the three Balkan countries: Bosnia, Serbia and Croatia. The study will be using the data with the graphical representations and publications regarding CPI and ANS in the period from 2014 to 2018 from the „Agency of Statistics in BiH“, „Trading Econometrics“ and „CEIC Data“. In order to test the hypothesis regression approach will be used where we define the regression models, find statistical relationship and present calculations reached in Excel and SPSS. Authors confirm the main hypothesis for all three countries using statistical tools such as mean and the median of descriptive statistics, correlation analysis, model summary with R, R-Square(s) and standard error of the estimate, ANOVA significance and coefficients – confidence intervals. Authors show that the relationship of CPI and ANS is rather strong hence the hypothesis stands. Authors conclude that this research could be helpful for the analysis of similar indicators for other transition economies.

Keywords: consumer price index, salary impact, Balkan countries, GDP, wealth creation.

1. Introduction

This research is examining the outcome of the change in two indicators, the Consumer Price Index and the Annual Net Salary. The goal is to calculate the change in one indicator by the approximate change in the other, across the three countries. Consumer Price Index is taken as the independent variable which change is causing the dependent variable change in Annual Net Salary. Consumer Price Index (CPI) is representing the change in inflation rate in the prices of products and services through the consumption and demand in the territories of Bosnia and Herzegovina, Croatia and Serbia. Consumer Price Index compares the inflation and price movements in one country like BiH with inflation in other countries like Serbia or Croatia. Products, goods or services that are bought by the population for consumption are included and written in the index. Net Salary or Annual Net Salary (ANS) is the money you ultimately receive into your account and it does not represent the actual amount of your work for one year. The amount of your work is Gross Salary, but you simply must share the difference of the amount with the state. People have developed the understanding of this procedures over time and they are more aware of their duties living less worried with the fact of cutting their earnings. The Net is therefore the money that taps

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under the people arms after the state takes a part that belongs to it. By comparing these two indicators, we will inspect the difference between the three neighbor countries and find out if this study can consider to fulfill the aim that it is set from the topic. This research will study five years of these countries from 2014 to 2018.

2. Discussion

The useful articles that helped me doing this research are those that were closest to the topic. For example; the definitions, information and regulations are obtained through the article „Consumer Prices, the Consumer Price Index, and the Cost of Living“. These authors explained how to accurately measure prices and their rate of change, inflation, and how that affect almost every economic issue. That includes growth and productivity, industry prices, government taxes and spending programs, budget deficits and debts, monetary policy, real financial returns, real wages, real median incomes and poverty rates, and the comparative performance of economies. The author explained that relative prices of different goods and services change frequently, in response to technological and other factors affecting costs and quality, which leads consumers to change their buying patterns. Despite important updates and improvements over time, the change in the CPI has substantially overstated the actual rate of inflation, and it is also likely to continue to overstate the change in the cost of living for the foreseeable future. (Boskin, 1998). Generally looking, the salary is considered as the income of most of the employed population in countries with a solid economy and which holds the main share between the market-specific fundamental incomes. According to the author of „Analysis Of The Evolution And Correlation Between Gross Net Salary And Consumer Price Index“, this author states that regarding their forms of existence and their practical significance, two forms of salary are distinguished: Nominal Salary (Gross and Net) and Real Salary. The Nominal Salary is the amount of money that the employee receives from his employer, expressed in current market prices. On the other hand, Gross Salary includes all income from work (basic salary and other benefits). In this article it is said that the Net Salary is based on the reduction of the Gross-Nominal Salary with the salary tax, social insurance contributions and other obligations stipulated by the law. In countries with market economy, the minimum wage is set by law. It consists of a certain amount of money needed for living insurance, being a measure of social protection of the employees. Its size varies from one country to another and from one period to the next. The Real Salary is expressed in the form of money, the quantity of goods, materials and services that can be acquired by an employee or a family of employees at a given time with the Net Nominal Salary earned. The size of the real wage was influenced by two factors: the Net Nominal Salary size and the price level of the goods for the consumption of the population. (Popescu, 2018). Now, regarding that the topic is related to the neighbor countries, we found out this study about Serbian economy. In a chapter of „Modeling And Presentation Of Macroeconomic Time Series Of Serbian Economy“ the author (Lojanica, 2018) says that economic growth parameters are key macroeconomic variables that are always in the public focus. With the inflation rate and the unemployment rate, a general picture of the development and review of the economy is being created. Inflation, economic growth and unemployment are central issues for social and economic livelihoods. It is undoubtedly that some of the macroeconomic goals are that a country wants to achieve economic growth, price stability and full employment. (Lojanica, 2018). In his study „The Analysis of Profit per Employee in the Trade of Serbia“ the author Lukić (2015) stated that there is a special system of indicators for measuring efficiency, productivity and performance of trade. The significance of profit per employee is expressed as a contemporary measure of trade performance. His work analyze the factors of the profit per employee that influence the trade in Serbia and some developed market economies. In that relation, profit per employee in trade of Serbia is significantly lower in observed companies and on the level of the whole trade. Increasing the profit per employee in Serbia for the future time is necessary to successfully control the critical factors of business success. The effects of all this are increased revenues, decrease of total costs and increase of total profit and profit per employee in trade of Serbia. (Lukić, 2015). Regarding our other neighbor – Croatia, there is a study of „Hedonic Regressions and Price Indices – Application to the Personal Computer Price Index in Croatia“. It explains different methods used in the CPI compilation process. This study overviews it's use for statistical method and discusses the possibility of its implementation in the price index compilation in Croatia. This overview helped to understand the statistically important information

that could be used in this research. Although the application of methodological regression is not directly required, numerous expert papers, analyzes in different countries and conferences dedicated to this topic in recent years point to the probability of initiating its application at least at the experimental level. On the other hand, it is necessary to emphasize that the calculation of the harmonized consumer price index is still largely based on recommendations, and only methods that are considered inappropriately are banned. (Botrić, 2004) In the study named “Impact of Authentic Leadership Style on Job Satisfaction: Case of Insurance Sector in Bosnia and Herzegovina” from the authors Ajana Šakić, Nereida Hadžiahmetović and Nataša Tandir (2019) the subject of discussion are the aspects of authentic leadership. That aspects are affecting worker’s job satisfaction in particular sectors in BiH. This study helps to understand the effects of the leadership on the job satisfaction and to find out how job satisfaction can be affected by the Net Salary (Šakić, 2019). The study written by Ensar Mekić and Emina Mekić (2013) pursue a discussion of a study called “Thinking ‘I’ and ‘The Company’ were the same”. These authors explain that the manager with leadership is better for a company, but that the leadership has it's traps. This should be the parallel with our study because it shows us how person can be selected to a position even when it is not aware of the abilities that it possess. That triggers some kind of consequences if that person is for example the manager that gives salaries to the employees. The more of “I” person that is, the more will affect the salaries and job satisfaction of the workers, and probably the whole chain which pulls the consumption next (Mekić, 2013).

3. Methodology

For the explanation of this study we will take the statistical approach, precisely the regression analysis where the Consumer Price Index is the independent variable and Annual Net Salary is dependent variable. This starts the main hypothesis of this research that is named „Change in Consumer Price Index has a strong effect on the change in Annual Net Salary“ – by implementing this hypothesis, we have to define it as the formula no.1. Assume that CPI is X and the independent, and ANS is Y which is dependent variable on the change in X. If we assume that, then we can make the formula like this:

$$Y = b_0 + b_1 * X \quad (1)$$

The b_0 is the percentage change. This formula can be plotted on the graph, whereas $+/- b_1$ represents the slope that is either positive or negative. Putting any number at the place of Y will automatically calculate the difference between these two variables and the causal effect of X will make the variable Y to change. Data collected is secondary data for most part of this research. It includes the sources from the Internet, articles, chapters, statements, conference papers, books and other types. This collected data and sources are mentioned in the section of Literature Review. The other group of data collected is from agencies for statistics in BiH, Serbia and Croatia, and from global data sources. Information that is plugged in this research is trying to fulfill the goal of the topic. This data will provide the backbone to the main hypothesis of this research. The main hypothesis is even assuming that the other factors like Inflation, Interest Rates, Exchange Rates, Import, Export and etc., also influence the change in Annual Net Salary with strong effect. This is important for the research because when we measure one indicator, we almost immediately assume that it will cause changes to another indicator(s). Countries that are taken for this research have similar history, present and fate in the economic activities. Entering the European Union did not make progress for Croatia in the sense of young people leaving the country trying to find well paid job. Some of them actually foresee that the CPI or other indicators do nothing significant to the increase in Net Salary. Serbia at the other hand, has probably one of the lowest minimal wages in our region. The problem is that the standards of all three countries is very huge regarding the prices of commodities. That emerges the statistics that the average family has monthly spending four or five times more than the minimal wage. However, this study shows that even with similar destiny, all three countries are aiming for the European Union recognition. Croatia is already inducted and Serbia and BiH are desperately trying to get there. By stating that change in CPI is causing change in ANS, the obvious question is how that looks in every year analyzed. This examining process concerns itself with the years from 2014 to 2018, collected from the data.

4. Results

In the annual report of financial sustainability of BiH we can see that deflationary pressures began to weaken in 2014. General consumer prices, measured by the consumer price index (CPI) in 2014 were lower than in the previous year. In December 2014, a deflation of 0.4 % was recorded on an annual basis level, while average consumer prices in 2014 were lower by 0.9 %. Deflationary movements at the end of the year are to a fall in prices in many categories like house and apartment, water, electric energy, gas and other energy products. Deflation movements continued in the first five months of 2015 in BiH. The prices measured in the CPI compared to the same period last year were lower by 0.5 %, while in May 2015 they recorded annual deflation rate of 0.4 %. Although indicators from the real sector show a slight recovery, economic activity in the country was still weak, and it was expected that weak domestic demand will continue in the upcoming period with limiting factor in terms of a significant economic growth activities in the country. With the two year period of stagnation, the average net salary in 2016 has slightly increased. Comparing it to the previous year, the average net salary has been increased by 0.96 % and in 2016 it amounted to 838 BAM. That increase in the average net salary do not significantly increase the purchasing power of its employees, bearing in mind the inflationary pressures at the end of 2016 and beginning of 2017. In 2017, a slight recovery of the economy continued in BiH, and according to the preliminary data of the Agency for Statistics in BiH, growth was recorded in almost all areas of the economic activities. Although there are noticeable positive developments in the labor market, average nominal net salary in 2017 it amounted to 851 BAM and in comparison with the previous year it increased by 1.5 %. (Central Bank of BiH – Financial Stability Reports 2014, 2015, 2016, 2017, 2018). Throughout the 2018, the average net salary was 889 BAM which shows a big progress regarding that many years ago average was almost 50 % lower. The CPI in 2014 to 2018 is increasing highly because many four-member families are spending four times more than receiving the minimum or average net salary. The graphical representation of that is shown in following [Figure 1](#).

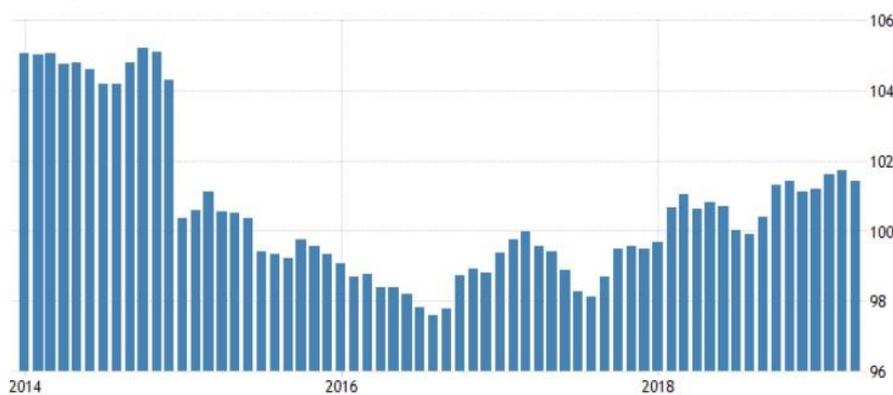


Fig. 1. Changes in BiH CPI 2014 – 2018

Source: Trading Econometrics – BiH CPI 5 year difference

In Serbia this was the state of the Consumer Price Index. In 2014 the CPI varies from 101,4 to 99,6 to monthly changes in previous month. Also from 103,1 to 101,7 at the end of the year comparing to the same month last year, and from 101,4 to 101,7 comparing to the December of previous year.

In 2015 the CPI varies from 99,8 to the same amount at the end of the year to monthly changes comparing to previous month. Also from 100,1 to 101,5 at the end of the year comparing to the same month last year and from 99,8 to 101,5 comparing to the December of previous year. In 2016 the CPI varies from 100,6 to the 99,9 at the end of the year to monthly changes comparing to previous month. Also from 102,4 to 101,6 at the end of the year comparing to the same month last year and from 100,6 to 101,6 comparing to the December of previous year. This was the state in 2017 and 2018. Throughout the both years the CPI varies from 101,4 to the 100 and 100,3 to 100,1 at the end of the year to monthly changes comparing to previous month. Also from 102,4 to 103

and from 101,9 to 102 at the end of the year comparing to the same month last year and from 101,4 to 103 and 100,3 to 102 comparing to the December of previous year.

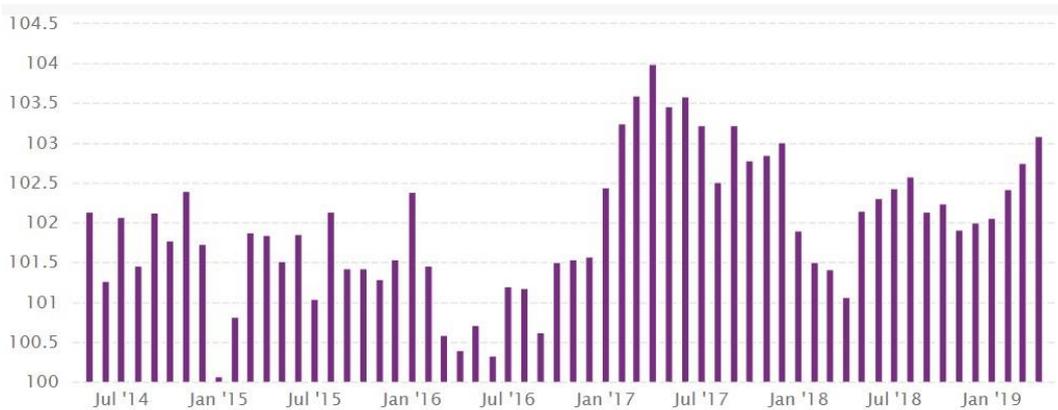


Fig. 2. Changes in Serbia CPI 2014–2018
Source: CEIC data – Serbia CPI 5 year difference

In Croatia, Consumer Price Index averaged 86,99 from 1998 until 2019, having the record high of 102,5 in October of 2018, and in April of this year the country was close to the record with 102,4. The following figure will present the actual state throughout the years, bearing in mind that in all these years Croatia was already a member of European Union.

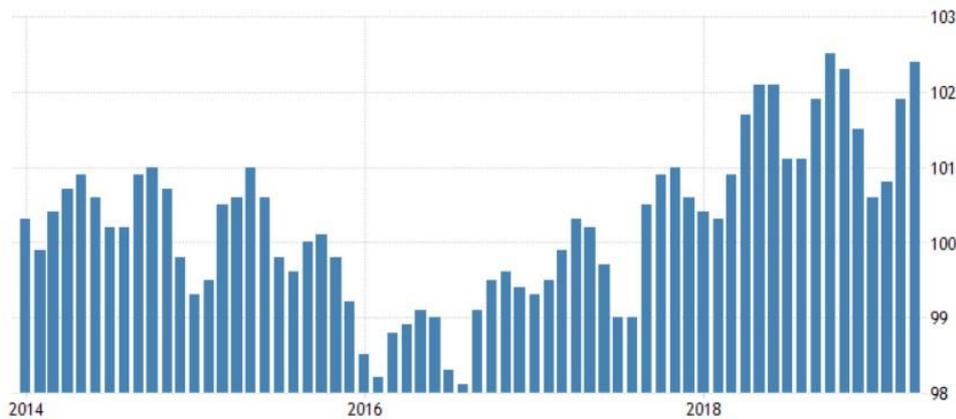


Fig. 3. Change in Croatia CPI 2014–2018
Source: Trading Econometrics – Croatia CPI 5 year difference

In this section, we present the statistical relation between CPI and ANS where we use regression analysis with the elements of descriptive statistics, correlation, ANOVA table, model summary and standard error of estimate and the coefficients. This the next figure shows the results of comparing and calculating the change of both indicators throughout five years in BiH.

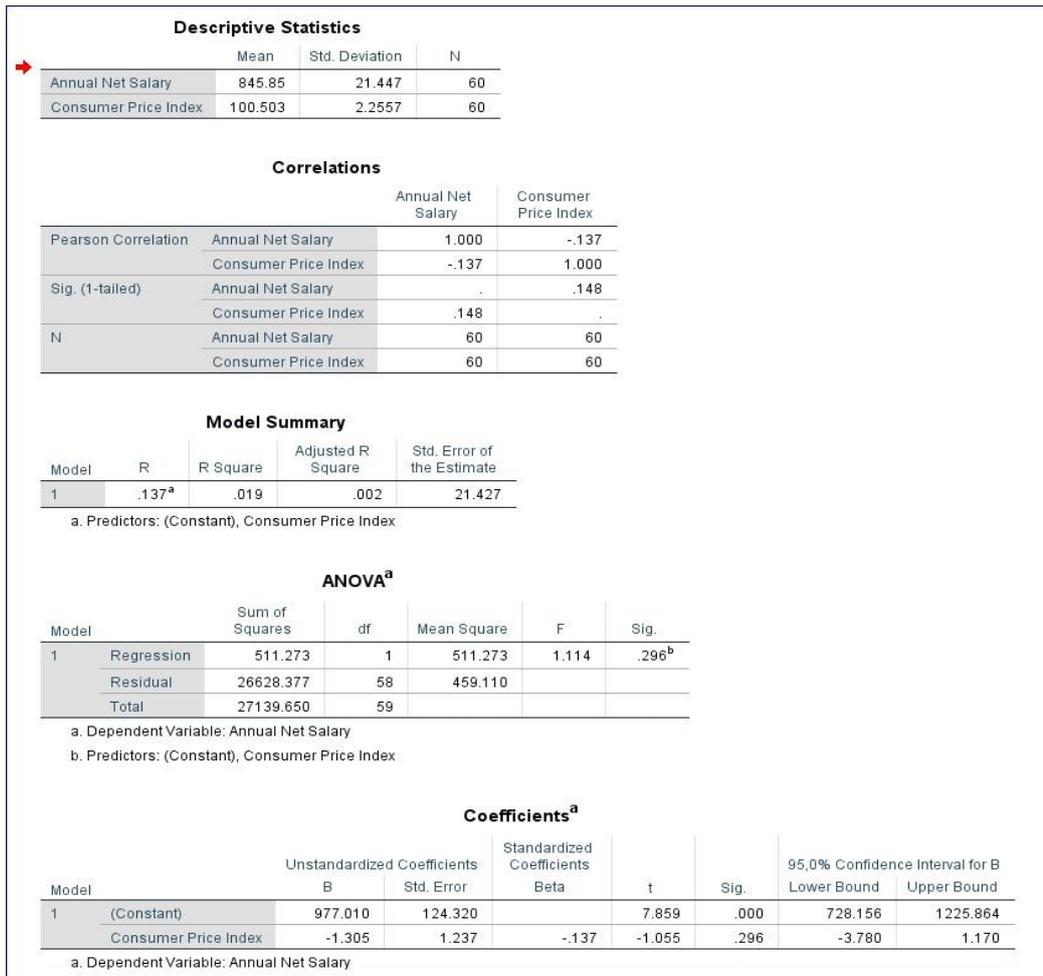


Fig. 4. Regression Analysis of Consumer Price Index on Annual Net Salary in BiH

Regarding Serbia, the average annual net salary is 46.515 RSD, and in 2014 the amount was 49.970 RSD and that is around 832 BAM which is very similar to average in BiH. Next year it has risen to 51.485 RSD, which equals around 858 BAM in 2015. In 2016 the average ANS was 53.456 RSD or 890 BAM. In 2017 and 2018 the average ANS was 54.344 and 52.372 respectively which equals 905 and 872 BAM. This shows that the ANS in Serbia in most years exceeds Bosnia's Annual Net Salary ([Trading Econometrics](#)).

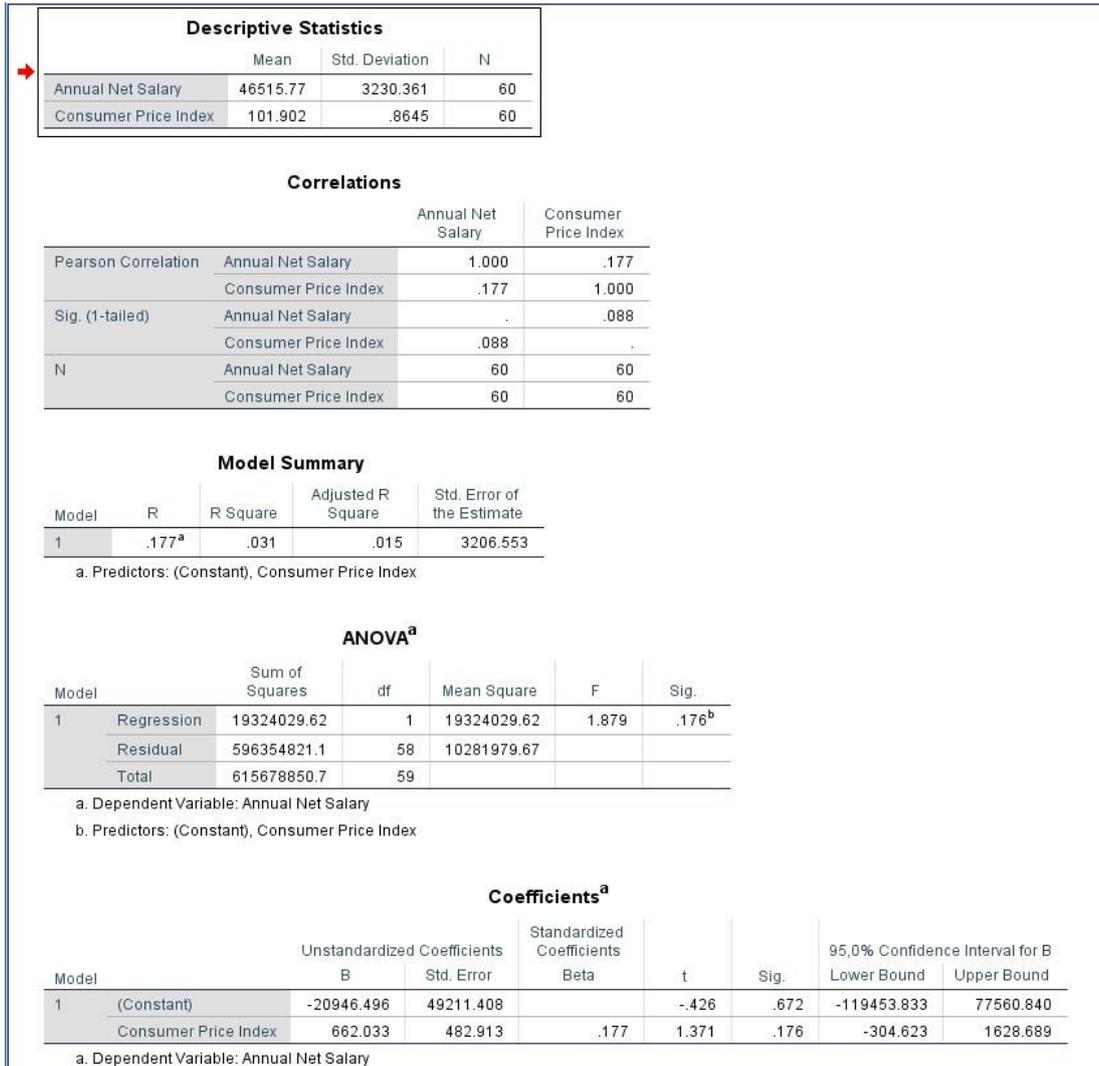


Fig. 5. Regression Analysis of CPI on Annual Net Salary in Serbia
Source: Author's calculations

The average salary of employees in the Republic of Croatia is 5830 HRK, and in January 2014 amounted to 5,553 HRK or 1388 BAM. The average paid off net salary per employee in the Republic of Croatia for 2015 amounted to 5,656 HRK and that is around 1414 BAM. The average monthly paid off net earning per person in employment in the Republic of Croatia for 2016 amounted to 5,685 HRK or 1421 BAM. The average net salary monthly paid per person in employment in the Republic of Croatia for 2017 was 6022 HRK, which is around 1500 BAM. The monthly paid net earnings per person in 2018 in Croatia amounted to 6,190 HRK, which is a nominal increase of almost three percent on a monthly basis and it equals around 1550 BAM. It is shown that almost double the annual net salary is in Croatia comparing to the BiH and Serbia. (Croatia National Bank)

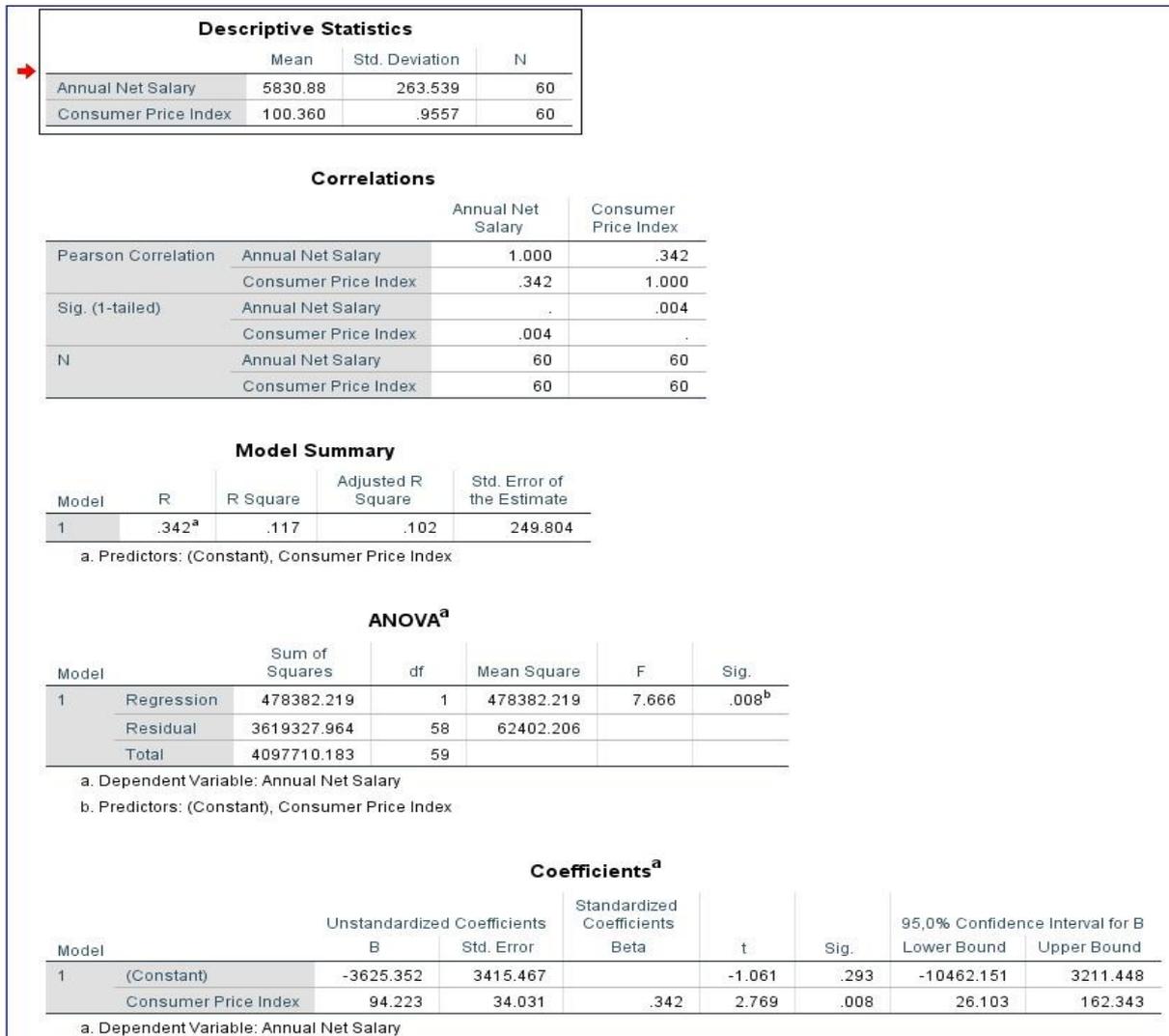


Fig. 6. Regression Analysis of CPI on Annual Net Salary in Croatia
Source: Author's calculations

5. Conclusion

This research was aiming to determine and examine the causal effect of Consumer Price Index on Annual Net Salary. Consumer Price Index or CPI is assumed as independent indicator and Annual Net Salary as dependent. We compared them in three countries of BiH, Serbia and Croatia. From the beginning of the research, we mentioned that this research used secondary data.

In methodology we reached the main hypothesis that is „A change in Consumer Price Index has a strong effect on the change in Annual Net Salary“. In the analysis and discussion we put few graphs and information from 2014 to 2018 across each of three countries for the mentioned periods.

We can see that in almost every segment, as the member of European Union, Croatia is highly in advance comparing to BiH and Serbia, whose goal is to enter the EU one day. Even regarding that, Croatia has a problem of young people leaving because of high consumption standards in the country.

In Serbia the situation is that the country has the problem of low wages, and food, fuel and living standards exceed the average salaries by far. Same situation is in BiH but this country is feeling the effect of even higher impact because of two entities Federation of BiH (FBiH), Republic of Srpska (RS) and district Brčko.

However it looks, the future does not look bright for these countries, or at least two of these three. Assuming that, in much more successful situation is Croatia which has the support of the

European Union. The only thing left for the other two countries is the hope that soon enough, they will enter the EU and stabilize their economic situation.

References

Boskin et al., 1998 – *Boskin, M.J., Dulberger, E.R., Gordon, R.J., Griliches, Z., Jorgenson, D.W.* (1998). Consumer Prices, the Consumer Price Index, and the Cost of Living. *Journal of Economic Perspectives*.

Botrić, 2004 – *Botrić, V.* (2004). Hedonic Regressions and Price Indices – Application to the Personal Computers' Price Index in Croatia. Article on Research Gate.

CEIC data – Serbia CPI five year difference [Electronic resource]. URL: <https://www.ceicdata.com/en/serbia/consumer-price-index-same-month-previous-year100/cpi-same-mth-py100>

Central Bank of Bosnia and Herzegovina – Central Bank of Bosnia and Herzegovina. Financial Stability Reports 2014, 2015, 2016, 2017, 2018. [Electronic resource]. URL: www.bhas.ba

Croatia National Bank – Croatia Average Net Wages [Electronic resource]. URL: <https://www.hnb.hr/statistika/statisticki-podaci/odabrane-nefinancijske-statistike/indeksi-placa>

Lojanica, 2018 – *Lojanica, N.* (2018). Modeling and presentation of macroeconomic time series of serbian economy. Chapter on Research Gate.

Lukić, 2015 – *Lukić, R.* (2015). The Analysis of Profit per Employee in the Trade of Serbia.

Mekić, Mekić, 2013 – *Mekić, E., Mekić, E.* (2013). Thinking 'I' and 'The Company' were the same. Conference Paper on Research Gate.

Popescu, 2018 – *Popescu, A.* (2018). Analysis of the evolution and correlation between gross net salary and consumer price index. Article on Research Gate.

Šakić et al., 2019 – *Šakić, A., Hadžiahmetović, N., Tandir, N.* (2019). Impact of Authentic Leadership Style on Job Satisfaction: Case of Insurance Sector in Bosnia and Herzegovina. Article on Research Gate.

Trading Econometrics – Bosnia and Herzegovina Consumer Price Index and Wages five year difference. [Electronic resource]. URL: <https://tradingeconomics.com/bosnia-and-herzegovina/consumer-price-index-cpi>; URL: <https://tradingeconomics.com/bosnia-and-herzegovina/wages>