THE IMPACT OF COMPENSATION GROWTH ON INFLATION RATE AND UNEMPLOYMENT

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Abstract: *The study analyzes the manner in which the growth rate of employees' compensation impacts both inflation rate and unemployment rate. The objective of the study is to identify, analyze and evaluate the effects of the compensation's growth on inflation and unemployment for five countries: Bulgaria, Czech Republic, Hungary, Poland and Romania with quarterly data collected for the period between 2000 - 2018. The results of the study proved to be important as it indicates the variation in the effects of compensation of employees on each indicator due to the pecularity of each country, as well as the manner in which every economy responds to a positive impact given by the growth of the general wage level.*

Keywords: compensation; inflation; unemployment; cointegration; causality

JEL Classification: E24, E31, M52

1. Introduction

The well-known relation between inflation and unemployment has been one of the most appealing subjects for economists in empirical literature. Thus, on short term, a low rate of unemployment can be obtained if a high rate of inflation is accepted by the economy. In this relationship, compensation of employees has an determinant role, as it significantly impacts both variables. This study aims to identify and assess the effects of compensation of ecmployees on both factors. This approach will be achieved through an econometric model, which aims to assess the intensity and direction of influence of this indicator.

For this study, the following countries are considered: Bulgaria, Czech Republic, Hungary, Poland and Romania. State selection has as starting point the consideration of the economies outside the Euro zone, where factors such as employees motivation are considerably driven by compensation package in order to achieve and mentain sustainable levels of figures such as unemployment and inflation. Thus, the selection criteria provides a homogeneous study group, as well as comparable results. In order to conduct the analysis, we used different econometric tests and methods to quantify the impact of the compensation growth. The results of the study are important, as they allow the formulation of proposals for guidance of compensation establishment process at national level in the direction of stimulating all groups of employees.

2. Literature review

This research analyzes the trade off between inflation and unemployment, as well as the effects given by general level of employees' compensation on both specific indicators. As a low rate of unemployment might be a desirable policy objective for a sustainable economy, not so many economists would consider a high rate of employment as a place for work for anyone who is looking for a job.

In one of his studies, economist Phillips compared the growth rates of both wage and unemployment for United Kingdom, and he concluded that as labour market shrinked, the general level of compensation would subsequently increase. Further, given the correlation between compensation and

overall prices increase, the economist's results have been considered as the trade-off between unemployment and inflation rate, and then developed as „the Phillips curve".

Madeira (2017) shows that the Phillips curve for United States data is more accurate if a behavioral model is used with both backward and forward looking forecast strategies and antrepreneurs using one of these two strategies based on their performance. In addition, Bhattarai (2013) indicates in his research paper that even if inflation rate increases, its response at a decrease in unemployment might be lagged and rather slow, which makes disinflation an expensive objective for public authorities. In this regard, the study developed by Cover (2010), demonstrates how both inflation and unemployment are disadvantageous for individuals and in this respect, any instrument that can be used by policymakers in order to avoid an increase of these variables are highly recommended.

3. Data and methodology

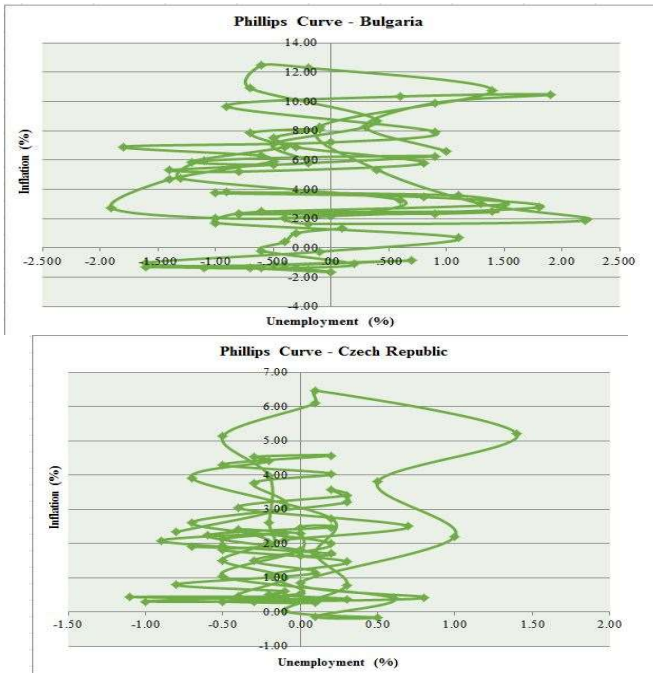
The study approches a way of analyzing the causality between the growth rate of employees' compensation and inflation rate, as well as unemployment rate, through various models and tests using Eviews (e.g., VAR / VECM model, the impulse-response function).

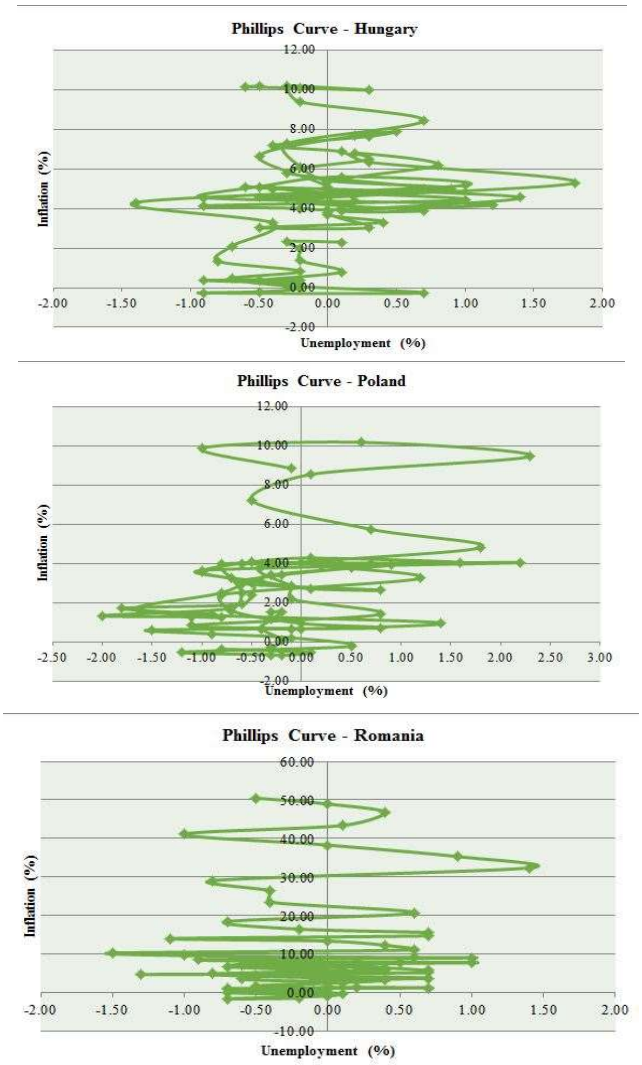
The three data series (employees' compensation, unemployment and inflation rate) were taken over for 18 years (2000-2018) from the official Eurostat database for each of the five economies: Bulgaria, Czech Republic, Hungary, Poland and Romania. In order to model the three variables and to get the relationship of influence between each factor and compensation' growth, we will use the Eviews 7 program. The use of cointegration as a case study methodology is motivated by the need to represent long-term causal relationships between unemployment / inflation rate and the growth of compensation.

4. Results

First, we analysed the Phillips curve developed for all five economies included in the study which represents the trade off between unemployment and inflation rate during 2000 – 2017. As Cashwell (2004) observed, the trade-off between inflation and unemployment from 1960 was available only in the short-run, its application being limited to our considered period.

Figure 1 The Phillips Curve for Bulgaria, Czech Republic, Hungary, Poland and Romania during 2000 - 2018





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As Figure 1 shows, the trade-off did not persist and we could not find similarities between the two variables. The irregular patterns obtained for all countries in Figure 1 indicate the high number of adjustments, as well as the numerous and volatile policy objectives set by public authorities in the last decade.

In order to analyze the cointegration of data series, we need to study the stationarity of the variables as well as the integration order. Using the Augmented Dickey Fuller test we checked both conditions. Further, we will use the ADF test to determine the data series integration order used in the model, and the results of running this test indicate that all three time series are 1st order integrated. The next step is to check the cointegration of each of pairs surveyed, namely: growth of employees compensation, inflation rate and unemployment rate.

Running the VAR model involves selecting the appropriate number of lags for each model, and this was done by considering the Likelihood Ratio, Final Prediction Error, Akaike information criterion, Schwarz information criterion and Hannan-Quinn information criterion.

The next step is to analyze the results of the Johansen Test to illustrate the long-term relationship between each pair of variables analyzed, and further we obtained for each model two cointegration relationships.

After lag selection, the patterns are run by using VAR for data series pairs where we have not observed cointegration relationships, respectively rewriting them as VECM for cointegration. We used

VECM models for all influence relationships between unemployment and compensation, respectively between inflation and compensation. This fact indicates the economic dependency of the indicators, as well as the short-term dynamic, results sustained also by the Phillips curve which are represented by Figure 1.

Table 1 VECM equations

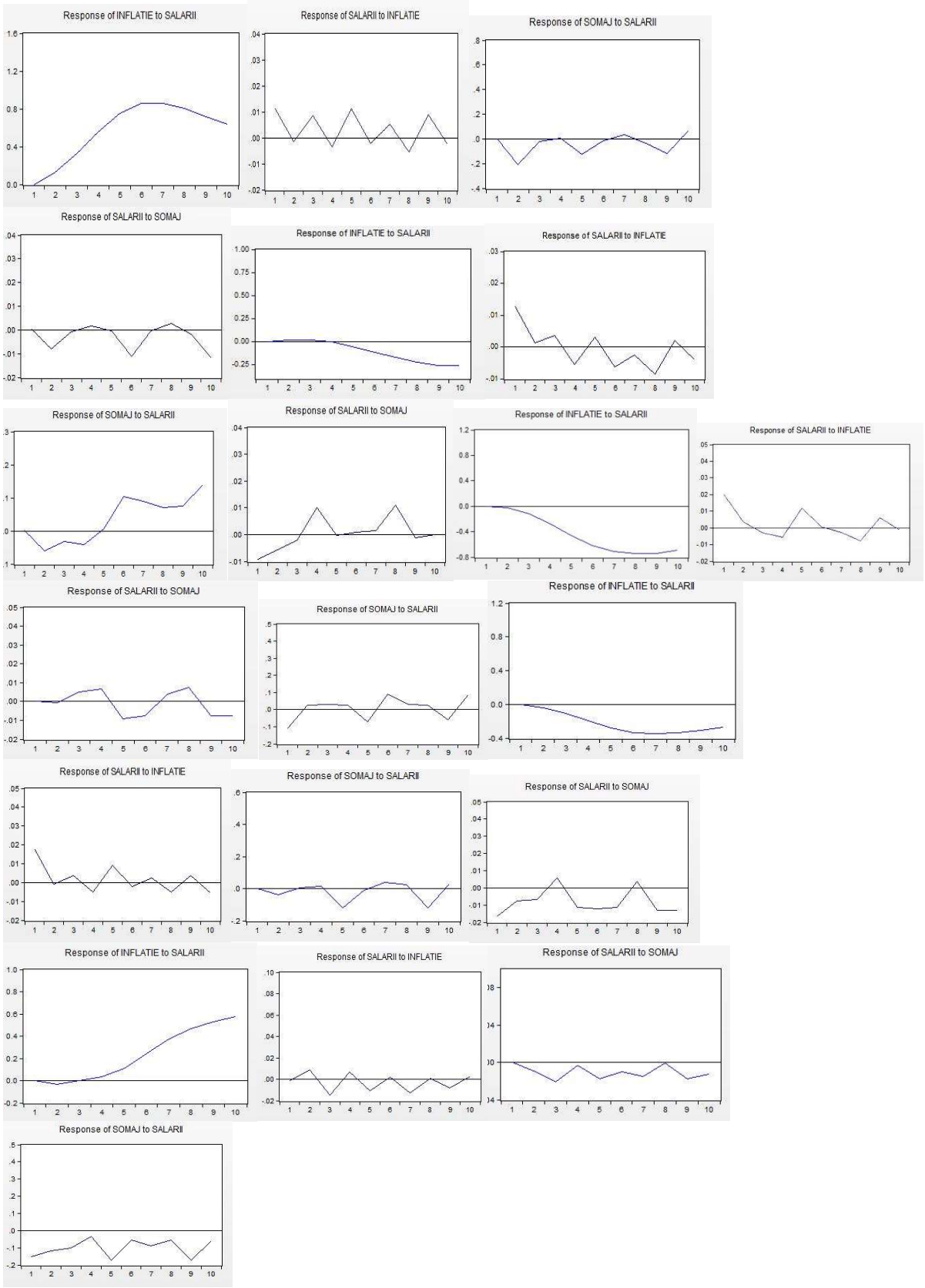
	Inflation_Compensation	**Unemployment_Compensation**
BG	D(Inflation) = C(1)*(Inflation(-1) - 498.029624512*Compensation(-1) + 9.1688057163) + C(2)*D(Inflation(-1)) + C(3)*D(Inflation(-2)) + C(4)*D(Inflation(-3)) + C(5)*D(Inflation(-4)) + C(6)*D(Compensation(-1)) + C(7)*D(Compensation(-2)) + C(8)*D(Compensation(-3)) + C(9)*D(Compensation(-4)) + C(10)	D(Unemp) = C(1)*(Unemp(-1) + 0.588048318627*Compensation(-1) + 0.190537398803) + C(2)*D(Unemp(-1)) + C(3)*D(Unemp(-2)) + C(4)*D(Unemp(-3)) + C(5)*D(Unemp(-4)) + C(6)*D(Compensation(-1)) + C(7)*D(Compensation(-2)) + C(8)*D(Compensation(-3)) + C(9)*D(Compensation(-4)) + C(10)
CZ	D(Inflation) = C(1)*(Inflation(-1) + 312.618264811*Compensation(-1) - 8.5981038337) + C(2)*D(Inflation(-1)) + C(3)*D(Inflation(-2)) + C(4)*D(Inflation(-3)) + C(5)*D(Inflation(-4)) + C(6)*D(Compensation(-1)) + C(7)*D(Compensation(-2)) + C(8)*D(Compensation(-3)) + C(9)*D(Compensation(-4)) + C(10)	D(Unemp) = C(1)*(Unemp(-1) - 11.1838883921*Compensation(-1) + 0.326557353137) + C(2)*D(Unemp(-1)) + C(3)*D(Unemp(-2)) + C(4)*D(Unemp(-3)) + C(5)*D(Unemp(-4)) + C(6)*D(Compensation(-1)) + C(7)*D(Compensation(-2)) + C(8)*D(Compensation(-3)) + C(9)*D(Compensation(-4)) + C(10)
UG	D(Inflation) = C(1)*(Inflation(-1) + 910.427947239*Compensation(-1) - 19.8820000654) + C(2)*D(Inflation(-1)) + C(3)*D(Inflation(-2)) + C(4)*D(Inflation(-3)) + C(5)*D(Inflation(-4)) + C(6)*D(Compensation(-1)) + C(7)*D(Compensation(-2)) + C(8)*D(Compensation(-3)) + C(9)*D(Compensation(-4)) + C(10)	D(Unemp) = C(11)*(Compensation(-1) + 0.00901681450822*Unemp(-1) - 0.0168681351736) + C(12)*D(Compensation(-1)) + C(13)*D(Compensation(-2)) + C(14)*D(Compensation(-3)) + C(15)*D(Compensation(-4)) + C(16)*D(Unemp(-1)) + C(17)*D(Unemp(-2)) + C(18)*D(Unemp(-3)) + C(19)*D(Unemp(-4)) + C(20)
PL	D(Inflation) = C(1)*(Inflation(-1) + 475.672120985*Compensation(-1) - 9.10205318123) + C(2)*D(Inflation(-1)) + C(3)*D(Inflation(-2)) + C(4)*D(Inflation(-3)) + C(5)*D(Inflation(-4)) + C(6)*D(Compensation(-1)) + C(7)*D(Compensation(-2)) + C(8)*D(Compensation(-3)) + C(9)*D(Compensation(-4)) + C(10)	D(Unemp) = C(1)*(Unemp(-1) + 31.3818694881*Compensation(-1) - 0.240751737201) + C(2)*D(Unemp(-1)) + C(3)*D(Unemp(-2)) + C(4)*D(Unemp(-3)) + C(5)*D(Unemp(-4)) + C(6)*D(Compensation(-1)) + C(7)*D(Compensation(-2)) + C(8)*D(Compensation(-3)) + C(9)*D(Compensation(-4)) + C(10)
RO	D(Inflation) = C(1)*(Inflation(-1) - 39.4518061327*Compensation(-1) - 7.57511836869) + C(2)*D(Inflation(-1)) + C(3)*D(Inflation(-2)) + C(4)*D(Inflation(-3)) + C(5)*D(Inflation(-4)) + C(6)*D(Compensation(-1)) + C(7)*D(Compensation(-2)) + C(8)*D(Compensation(-3)) + C(9)*D(Compensation(-4)) + C(10)	D(Unemp) = C(11)*(Compensation(-1) + 0.207543947124*Unemp(-1) - 0.0188272491476) + C(12)*D(Compensation(-1)) + C(13)*D(Compensation(-2)) + C(14)*D(Compensation(-3)) + C(15)*D(Compensation(-4)) + C(16)*D(Unemp(-1)) + C(17)*D(Unemp(-2)) + C(18)*D(Unemp(-3)) + C(19)*D(Unemp(-4)) + C(20)

Source: Authors' work

The cofficients C(1) obtained through VECM models support the existence of a long term causality relation for inflation / unemployment and compensation in case of Bulgaria, Hungary and Romania. We further notice the unfavorable results for Poland given by the lack of negative and statistically significant coefficients.

The coefficients obtained for the models developed for Hungary determine that we can state the presence of causality from compensation to both inflation and unemployment on a long period of time. With respect to Bulgaria models, we have obtained the causality of compensation – inflation rate on long-term.

Figure 2 Impulse – response function for Bulgaria, Czech Republic, Hungary, Poland and Romania



Source: Authors' work

The impulse - response representations show the specificity and the variaty of each inidicator (unemployment / inflation rate) response at an positive impact given by employees' compensation

growth. Thus, the unemployment rate has recorded fluctuations, mainly around the zero value, with an ascending trend in Czech Republic. The analysis of Granger test indicates the highest causality between unemployment and the growth of compensation for the Czech economy.

Table 2 Selection of statistically significant results of the Granger test

	Null hypothesis	Prob
BG	Unemp does not Granger Cause Compensation	0.0953
CZ	Compensation does not Granger Cause Unemp	0.0053
	Unemp does not Granger Cause Compensation	0.0152
PL	Unemp does not Granger Cause Compensation	0.0596

Source: Authors' work

In addition, from Table 2 we note the lack of favorable outcomes for the Romania and Hungary, for which we have not identified causal relationships.

5. Conclusions

The analysis of the entire set of results for all five states included in the study indicates the causal relationship between compensation of employees and inflation / unemployment. Thus, the results are varied: in Bulgaria and Poland unemployment causes the rise of compensation, we have not achieved a relationship of cointegration for none Hungary, nor Romania, and in case of Czech economy we have achieved bidirectional causality.

The causal relationship from unemployment to compensation increase is also confirmed by the results of the study by Stock (2001). Thus, the economist underlined that a high flexibility of labour market is recommended in order to exclude distortions caused by institutional supply side for a long term growth in these economies.

An overall analysis of the obtained results indicates that Bulgaria recorded highest causality and cointegration relationship between unemployment / inflation rate and compensation of employees. We also note the increased number of causality relations from unemployment to wages rise, explained by Johansen test, VECM coefficients, Wald test, as well as Granger.

In the case of Romania, although the causal relationship between compensation growth and inflation / unemployment is supported by the results of the Johansen test which demonstrated long-term causality and the Wald test confirming short-term causality, the results of impulse-response functions indicate low responses in growth of labour market' activity and inflation from the positive impact of wages' dynamics.

6. References

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