Monetary Policy and Inflation: Is there a Neo- Fisher Effect? Evidence from Inflation Targeting Countries in Central and Eastern Europe

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Abstract

In this study we empirically investigate the influence of the low interest rate environment adopted by inflation targeting countries from Central and Eastern Europe as a rescue measure after the outbreak of the financial crisis. Moreover, we focus on examining the existence of a Neo-Fisher effect that may explain the positive relation between interest rates and inflation, with causality from interest towards inflation rate. We employ a Vector Autoregressive model, together with an impulse response analysis and a variance decomposition technique, to capture the response of economic growth and inflation to shocks to the monetary policy. Our main results point to a negative relation between policy rates and economic growth, as predicted by the economic literature. However, results show a significant positive relation between interest rates and inflation, meaning that negative shocks to interest rates lead to lower inflation. Also, we find that the response of inflation and economic growth is the same, regardless of the crisis or non-crisis period.

Key words: interest rates, inflation, Neo-Fisher effect, monetary policy
J.E.L. Classification: E43, E31, E52

1. Introduction

In the years following the 2008 financial crisis, the major central banks all over the world have adopted an expansionary monetary policy with the aim of supporting the banking systems and avoid a deeper economic recession, or, even a collapse of it. The same behavior was employed by the central banks in Central and Eastern Europe, although adapted at the economic situation of each country in the region. However, in spite of the continuous efforts of monetary authorities to expand their conventional instruments to boost the economic growth, there is a slow response from it. Furthermore, the very low interest rates established by central banks should, at least in theory, lead to an increase of prices and to higher levels of inflation. Again, this effect is not observed in the real economy and we can say that the reality contradicts the theory since, at least after the crisis and until recently, the low interest rates coexist together with low inflation.

In the context of the recent financial crisis, there is an increasing interest towards a re-analyze of the relation between interest rates and inflation, in the spirit of the so-called Fisher effect, which postulates a positive relation between the two rates, with the causal impact from inflation to interest rate (Anari and Kolari, 2016). The on-going debate, known as Neo-Fisherism (Bullard, 2016; Cochrane, 2016; Williamson, 2016) argues that it may be the case that the Fisher effect works in practice not from inflation towards interest rates, but rather in the opposite direction, from monetary policy towards inflation. Cochrane (2016) makes an extensive analysis of different models that incorporate the reaction of inflation to interest rates and a review of empirical results on this topic, concluding that it may be the case that economists and monetary authorities tend to overlook the existence of a positive impact of inflation to the interest rate movements. Williamson (2016) share the same opinion, reminding the case of the Federal Reserve Bank as the only central bank that decided to gradually increase the interest rate, although it does not motivate this decision

using the Neo-Fisherian argument. However, the President and CEO of Federal Reserve Bank from St. Louis, James Bullard, emphasized, in a speech delivered at the 19th International Research Forum on Monetary Policy, that the existence of a Neo-Fisher effect should be seriously taken into account in shapping the future monetary thinking.

In this paper we aim to empirically investigate the Neo-Fisher effect. Our research question is: Does a low interest rate environment mean higher or lower prices? Moreover, we want to investigate the following research hypothesis: Low interest rates are positively related with inflation.

2. Data and methodology

The aim of our paper is to analyze the monetary policy adopted by the inflation targeting countries from Central and Eastern Europe in the period 2005-2015. Also, we investigate the influence of the monetary policy stance on the economic growth and inflation. Moreover, we investigate the existence of a Fisher effect that could explain the relation between the interest rates and inflation for the countries under review.

Our sample consists of the following inflation targeting countries in Central and Eastern Europe: Albania, Czech Republic, Hungary, Poland, Romania and Serbia. As in Plescau (2017), we do not take into consideration Ukraine because it has decided to enter into a process of implementing the inflation targeting regime only recently, in 2016. We use the World Bank data facility to obtain information regarding the inflation rate and the economic growth. Also, we use the websites of the central banks from each country in our sample to obtain information regarding the monetary policy adopted by each country.

We measure the monetary policy stance using the central bank policy rate, while the inflation is captured through the Consumer Price Index (CPI) and the economic growth is measured through the Gross Domestic Product (GDP) growth rate. Also, when we discuss about the central bank policy rate we take into account the annual mean value of it.

A first step in our study is to analyze the relation between the variables included in the analysis. We first look at the descriptive statistics of the data and, afterwards, we look at a scatter plot that defines the relation between the interest rate and the inflation rate for the countries included in the sample, during the period under review.

Table 1 shows the descriptive statistics of our data. The central bank policy rate has a mean value of 5.409%, with a minimum of 0.05% (registered in Czech Republic for years 2014, 2014 and 2015) and a maximum of 17.750% (registered in 2008 in Serbia). In our sample, during the period 2005-2015, only Czech Republic is the only country that confronted the technical zero-lower bound for the interest rate and there are no negative values for the nominal interest rate. Moreover, economic growth has a mean value of 2.58%, with a minimum value of 7.10% and a maximum value of 8.50%. The lowest GDP growth rate was registered in 2009 in Romania and it shows the negative effects of the crisis on the economic activity. Furthermore, the inflation rate has a mean value of 3.95%, with a minimum of -1% (in 2015 in Poland) and a maximum of 16.10% (in 2005 in Serbia).

Table no. 1 Descriptive statistics of the variables included in the analysis

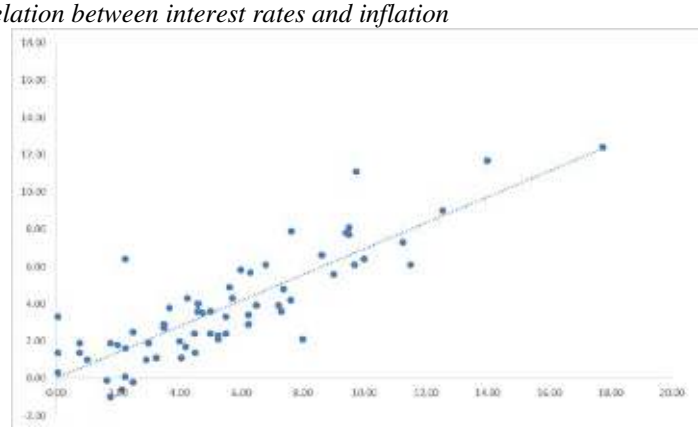
Variable	Description	Mean	Std. Dev.	Min	Max	Obs.
IR	Central bank policy rate	5.409	3.617	0.050	17.750	65
EC_GROWTH	Economic growth – GDP growth	2.68	3.17	-7.10	8.50	66
CPI	Inflation – Consumer Price Index	3.95	3.29	-1.00	16.10	66

Source: own computations

The aim of our paper is to investigate the impact of monetary policy on the macro-economy, with a focus on the relation between interest rates and inflation. Having as a start point the Neo-Fisherian argument that establishes a positive relation between them in the sense that low interest rates lead to an increase of the inflation rate, we want to study whether this is true for the inflation

targeting countries in Central and Eastern Europe, in the context of the recent financial crisis. A first look at the data, as shown in Figure no.1, shows that there is a positive relation between interest rates and inflation and that the expansionary monetary policy adopted after the crisis has not led to an increase of the consumer price index. This result could be explained by the Fisher effect, which supports a positive relation between monetary policy and inflation. Moreover, we conduct an in-depth analysis to better investigate our hypothesis.

Figure no. 1. The relation between interest rates and inflation



Source: own computations

We develop our methodology based on Papadamou et al (2015). In order to investigate the impact of monetary policy on the inflation and economic growth, we employ the Vector Autoregressive (VAR) estimation method. Our sample is organized as a panel data with 6 cross-sections (countries) with 11 years for each country. In total, we have 66 country-year observations. Moreover, as Papadamou et al. (2015), we conduct an impulse response and a variance decomposition analysis.

Using Brooks (2008) we define our basic models as follows:

$$Y_{i,t} = A_0 + A_1 Y_{i,t-1} + e_{i,t} \quad (1)$$

In the above equation, $Y_{i,t}$ is a vector that contains the following variables: EC_GROWTH, CPI and IR. Adopting the strategy of Papadomou et al. (2015), EC_GROWTH is the logarithm of GDP growth, while CPI is the logarithm of the Consumer Price Index. Moreover, IR captures the monetary policy stance and it is defined as the central bank policy rate established by each central bank.

We apply the impulse response analysis in order to investigate the responsiveness of the economic growth and inflation to a shock in the central bank policy rate. This helps us understand the sign of the relationship between the variables under review and to determine whether there is a negative or a positive relation between them. Moreover, we use the Cholesky decomposition for identifying the shocks or the innovations to the interest rate. A shock to the interest rate is defined as one standard deviation of this variable (Papadamou et al., 2015). Also, as Papadamou et al. (2015) have done, we use two different orderings for our variables, as a robustness check.

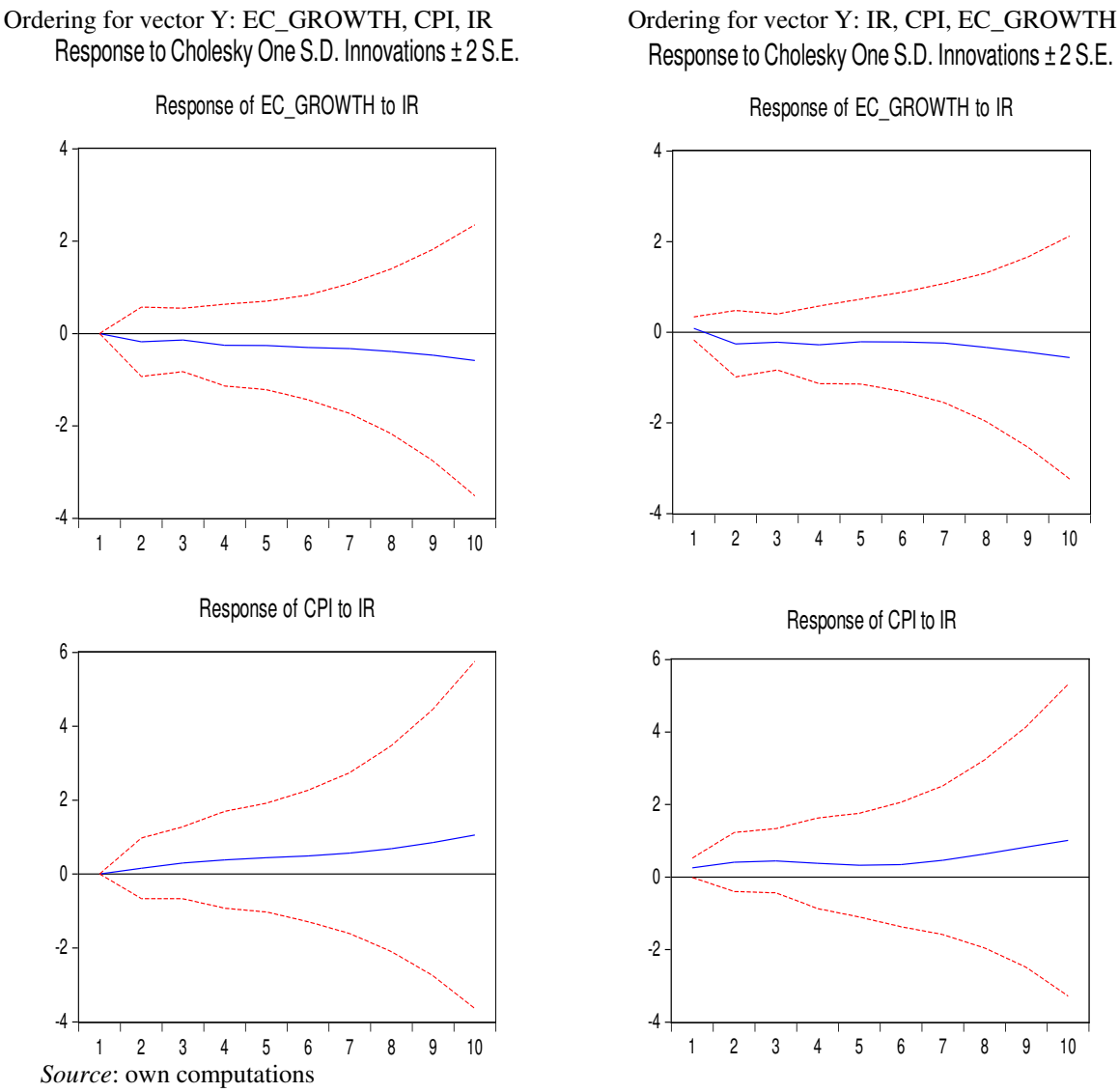
Besides using the impulse response analysis, we apply the variance decomposition in order to evaluate the proportion of the variance in one variables that is explained by the shocks to each variable in the system, including their own shocks (Brooks, 2008).

In addition to our basic estimation, we investigate whether the relation between interest rates and economic growth and inflation is different in the crisis period. To do so, we define a dummy variable, CRISIS, which takes the value of 1 for the period 2008-2010 and 0 elsewhere. Further on, we will apply the VAR methodology using the following version for Y vector: {EC_GROWTH, CPI, IR*CRIS, IR*(1-CRIS)}.

3. Results

We apply two different orderings for the vector Y. The basic ordering is {EC_GROWTH, CPI, IR}, while we use the reverse order of this vector as robustness check (Brooks, 2008; Papadomou et al., 2015). The results of the impulse response analysis are shown in Figure no. 2. They point to a negative relation between interest rate and economic growth, as predicted by the economic literature. This means that a negative shock to the central bank interest rate will increase the GDP, supporting the economic growth, as expected by the monetary authorities when adopting low levels of the interest rate. However, in contrast to what the theory says, our results show a positive relation between interest rates and inflation during the entire period 2005-2015. This result highlight that a negative shock to the central bank policy rate will decrease the inflation rate. Our result can be seen as a Neo-Fisher effect, as it is argue in Williamson (2016). Our result is in contrast to what Papadamou et al. (2015) obtain and maybe this is due to the fact that they use a different time period, 19998-2010, which does not capture the effect of the recovery period after the financial crisis. We can observe in Figure no. 2 that our results are the same, independent of the ordering we use to define our vector Y.

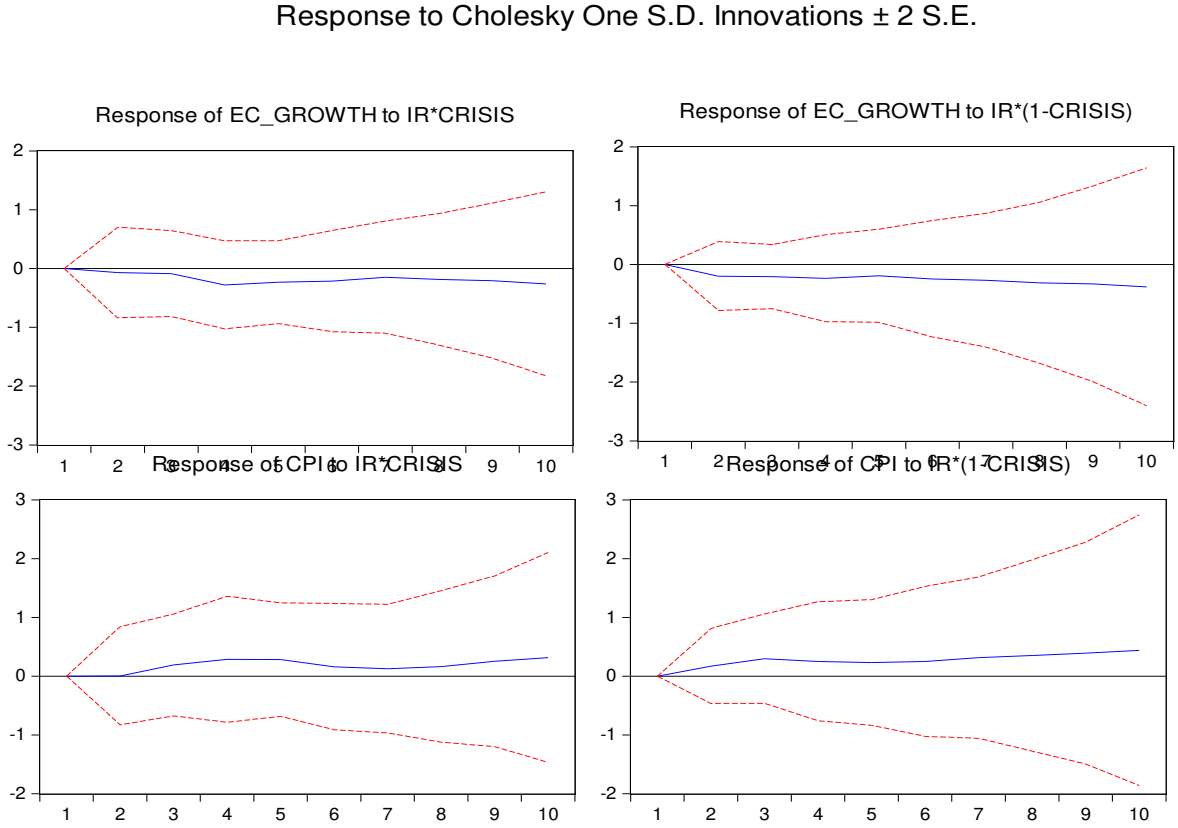
Figure no. 2. Impulse response analysis using the two ordering for the variables of vector Y



Source: own computations

The results obtained when differentiating between the crisis and non-crisis period are synthesized in Figure no 3. As a general conclusion, results show that the relation between interest rates and economic growth and inflation is the same, independent of the crisis effects. Moreover, this analysis supports the previous result that one standard innovation to the central bank interest rate is positive related to the inflation rate. Furthermore, this means that low levels of interest rates are associated with low levels of the inflation rate (consumer price index).

Figure no. 3: The impulse response analysis – crisis versus non-crisis period



Source: own computations

The results regarding the variance decomposition are reflected in Table 2. As in Papadamou et al. (2015), we show the results that represent the total impact for the 10th period. We observe that the movements in the level of interest rates influence, to a significant degree, the variance of both economic growth and inflation. This result support the ones obtain by applying the impulse response analysis.

Table no. 2 Variance decomposition analysis

Variable	Period	EC_GROWTH	CPI	IR
EC_GROWTH	10	28.244	16.189	55.567
CPI	10	7.593	27.359	65.048
IR	10	1.035	1.071	97.894

Source: own computations

4. Conclusions

In this study we analyze the impact of the monetary policy adopted in Central and Eastern Europe on the two main macro-economic indicators: economic growth and inflation. Also, for comparability reasons, we include in our sample only the inflation targeting countries from this European region. There are two important conclusions pointed out by our results, The first one is the negative relation between interest rates and economic growth and this means that the low interest rates adopted by central banks especially in the years after the financial crisis had a beneficial impact on stimulating the economy. Furthermore, the second conclusion is the existence of a positive relation between monetary policy and inflation, and this is a puzzling results since it is in contrast with the economic theory that predicts a negative relation between the two. However, our result are in line with the recent ongoing discussion about the possible existence of a Neo-Fisher effect that argues a positive relation between interest rate and inflation, with causation from the first to the latter.

Our study contributes to the literature related to the effects of low monetary policy adopted by many central banks as a rescue measure after the outbreak of the 2008 financial crisis. Also, we relate our analysis to the theoretical debates about the relation between monetary policy and inflation and the sense of the causal effect between them. In this sense, we consider that out study is a step-forward toward the empirical investigation of the Neo-Fisherian argument. Also, in the context of the recent financial crisis, we think that it is highly important to extend the research related to the interest rate-inflation nexus, since the recent financial events and the dynamics of economic realities may deliver new insights regarding the economic and monetary theory.

5. Acknowledgement

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6. References

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