Emerging Markets Queries in Finance and Business

Analysis of the Behavior of Central Banks in Setting Interest Rates. The Case of Central and Eastern European Countries

Iulian Vasile Popescu\textsuperscript{a,\*}

\textsuperscript{a}Alexandru Ioan Cuza University, B-dul Carol I, nr.22, Iași, 700505, Romania

Abstract

This paper aims to identify the final objectives actively pursued by central banks in Central and Eastern Europe that promote an independent monetary policy. We achieved our scope by investigating the behavior of national monetary authorities in setting short-term nominal interest rates. In this regard we estimated (based on the Generalized Method of Moments) three extensions of a monetary policy Taylor-type rule that takes into account the specifics of the selected countries-emerging economies with a high degree of openness and in full process of convergence towards the euro area. We included in the monetary policy rule additional variables targeted to financial stability in order to determine how concerned monetary authorities have approached the cleaning or mopping-up versus leaning against the wind strategies. The results revealed the main orientation towards their fundamental objective of price stability, but in parallel, to the stabilization of real economic activity and the exchange rate. However, changes in short-term nominal interest rates closely follow the changes in the Eurozone short-term nominal interest rate, while the inclusion of asset price developments indicated a heterogeneous situation among selected central banks.

© 2014 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/3.0/).

Selection and peer-review under responsibility of the Emerging Markets Queries in Finance and Business local organization

Key words: Taylor rule; monetary policy; Central and Eastern Europe; Generalized Method of Moments (GMM)

1. Introduction

Identifying the behavior of central banks (CBs) in setting interest rates may provide a conclusive picture on both the objectives and their prioritization. A standard approach in this respect is the estimation of the central bank reaction function as a Taylor rule. The extensions of Taylor monetary policy rule proposed in this paper are strictly oriented towards country specific factors in Central and Eastern European states, emerging

* Corresponding author. Tel.: +40-740-126-142.
E-mail address:ipopescu1974@yahoo.com.

2212-5671 \textcopyright \textregistered 2014 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/3.0/).
Selection and peer-review under responsibility of the Emerging Markets Queries in Finance and Business local organization
doi:10.1016/S2212-5671(14)00565-6
economies with a high degree of openness targeting the adoption of the single currency. Moreover, their particular monetary policy rule will consider additional variables aimed at financial stability in order to identify how the selected monetary authorities have approached asset prices in the conduct of monetary policy. The models are built on the assumption that the monetary authority follows a strategy of flexible inflation targeting.

Therefore, attention will be paid to the states in the region on the way to the euro adoption and with independent monetary policy, namely the Czech Republic, Poland, Romania, Hungary, but the analysis will also include the parameters for Slovakia and Slovenia until their accession to the Eurozone (EZ). For the other CEE countries that are also making efforts to become part of the EZ, namely Bulgaria, Latvia and Lithuania, the study of the monetary policy decision-making through a Taylor-type rule is not relevant because of the lack of monetary policy independence, given that under an exchange rate targeting strategy, domestic interest rate is not an exogenous variable (set by the monetary authority) but an endogenous one, being determined in the money market.

2. Literature review

While the empirical literature concludes that monetary policy conducted by the central banks of the major developed countries can be described by such a reaction function (Clarida et al., 1998), existing evidence for emerging countries, including Central and Eastern European member states is much narrower.

Most studies that focus on building Taylor-type rules for the CEE region analyze the Czech Republic, Poland and Hungary. Angeloni et al., 2007 compared the results obtained from estimating a Taylor-type rule for these three economies with the ones identified for the euro area, covering the period 1999-2004. Their findings revealed the consistency of the monetary policy fundamental objective in selected countries with the ECB commitment to price stability.

María Dolores, 2005 provided estimates of a simple Taylor rule for the Czech Republic, Poland, Hungary and Slovakia, concluding that the setting of the interest rates for the first three (between 1998 and 2003) could be reasonably described by a simple backward-looking Taylor rule, while for Slovakia, a forward-looking rule would have the ability to better describe the behavior of the central bank in establishing interest rates. Paez-Farrell, 2007 investigated to what extent Taylor-type rules provide an adequate description of the behavior of central banks in setting interest rates in the four member states of the Visegrad Group for the period 1998-2006, taking into account six different specifications of such monetary policy rules. The main conclusion highlights the role of the exchange rate in the monetary policy rule in three of the four countries subject to analysis (Poland, Slovakia and Hungary).

Frommel and Schobert, 2006 enlarged the analysis group to the Czech Republic, Poland, Romania, Slovakia, Slovenia and Hungary and examined the exchange rate as additional explanatory variable. The conclusions of the two authors do not support the validity of the Taylor rule, which has reduced capacity to offer a reasonable description of the monetary policy implemented by the six countries during 1994-2005. In a new paper from 2011, Frommel et al. have addresses the monetary policy rules for selected countries covering the time span 1994-2008, including changes in exchange rate regimes, which resulted in a substantial improvement of the results compared to the previous findings.

Vašíček, 2009 followed the rationale of interest rate setting by the central banks of the 12 new European Union member states. Considering different specifications of the Taylor-type rule (backward - looking and forward-looking, but also the sequential insertion into central bank reaction function of the nominal and real effective exchange rate, money supply, the long-term interest rate, foreign interest rate and asset prices) for the period 1999 - 2007, the author underlined that this monetary policy rule is not always consistent with the official monetary policy.

Orlowski, 2008, 2010 emphasizes the need to include in the formalized expression of selected monetary authorities reaction function their position as countries acceding to the Eurozone by adding to the rule the euro
area (for instance, EZ interest rate) and national macroeconomic variables as well as certain target variables for 
EZ (e.g., inflation gap, calculated as difference between the current rate of domestic inflation and the inflation 
target of the European Central Bank or an inflation target derived from the stability price criterion of the 
Maastricht Treaty).

As for exploring interactions between monetary policy and financial stability, one significant early study 
considering a number of emerging economies (the Czech Republic, Poland and Hungary) is that of Munoz and 
Schmidt-Hebbel, 2012. The authors have analyzed monetary policy decisions on a group of 28 emerging and 
developed countries between 1994 and 2011 by including into the Taylor rule alongside the exchange rate, two 
financial variables, namely the development of private credit and stock prices, and examined their orientation 
towards avoiding the formation of asset prices bubbles. Munoz and Schmidt-Hebbel (2012) identified the 
existence of specific factors that indicate a leaning against the wind approach of monetary policy in the 
countries subject to analysis.

3. The Model: Customization of the Taylor rule to the distinctive features of selected states

The first of the three proposed reaction functions take into account the specificity of analyzed countries as 
economies with a high degree of openness. The reaction function expressed by equation (1) is based on the 
simple rule formulated by Taylor in 1993, on modifications recommended by Clarida et al., 1998, 2000, to 
introduce additional variables as expectations and on the partial adjustment mechanism of the interest rate and 

\[ i_t = \rho i_{t-1} + (1 - \rho)(\alpha + \beta_\pi \pi_{t+m} + \beta_y y_{t+n} + \beta_s \Delta s_{t+p}) + \varepsilon_t \]  

(1)

where: \( i_t \) - the current interest rate set by the central bank; \( i_{t-1} \) - previous value (with a period) of the 
interest rate set by the central bank; \( \rho \in [0,1] \) - interest rate degree of inertia (interest rate smoothing); \( \alpha = \bar{i} - \beta_\pi \pi^* \); \( \bar{i} \) - equilibrium nominal interest rate (given by the sum of the equilibrium real interest rate consistent with 
long term full employment and the current level of inflation); \( \pi^* \) - the inflation target; \( \pi_{t+m} \) - inflation value 
at time \( m \); \( y_{t+n} \) - GDP deviation at time \( n \); \( \varepsilon_t \equiv -(1 - \rho)\{\beta_\pi(\pi_{t+m} - E[\pi_{t+m}\vert \Omega_t]) + \beta_y(y_{t+n} - Eyt+n/\delta t+\nu t) \} \) - the linear combination of the forecast errors of inflation and GDP and \( \varepsilon_t \), initial exogenous 
shocks; \( \Delta s_{t+p} \) - the real effective exchange rate fluctuations; \( \beta_\pi, \beta_y \) and \( \beta_s \) - the weights assigned by the central 
banks to inflation target, real economic activity and the exchange rate.

Countries analyzed, in addition to their specific as small open economies (which has led to the need to introduce the exchange rate in the Taylor rule) involve, in addition, another distinctive feature related to their 
position as Eurozone acceding candidates, which further implies the including of the EZ short-term nominal 
interest rate in the equation (1) that becomes:

\[ i_t = \rho i_{t-1} + (1 - \rho)(\alpha + \beta_\pi \pi_{t+m} + \beta_y y_{t+n} + \beta_s \Delta s_{t+p} + \beta_l^{EUR} l_{t+1}^{EUR} + \varepsilon_t) \]  

(2)

where \( l_{t+1}^{EUR} \) is the nominal short-term interest rate.

The adding to the monetary policy rule of certain variables to identify the behavior of central banks towards 
ensuring the financial stability leads to equation (3):

\[ i_t = \rho i_{t-1} + (1 - \rho)(\alpha + \beta_\pi \pi_{t+m} + \beta_y y_{t+n} + \beta_s \Delta s_{t+p} + \beta_h \Delta sm_l_{t+e} + \beta_c \Delta pc_{t+f}) + \varepsilon_t \]  

(3)

where: \( \Delta sm_l_{t+e} \) is the annual change in the stock market representative index and \( \Delta pc_{t+f} \) is the annual
growth of nongovernmental credit. The introduction of these variables allows for the identification of the way monetary authorities have approached the mopping-up versus leaning against the wind strategies.

4. Methodology and data

The estimation of monetary policy rules expressed by equations (1), (2) and (3) is based on the Generalized Method of Moments (GMM). To predict the response function of equation (1), we considered the following instrumental variables: a constant, the first 3 lags, the sixth lag and the twelfth lag of the interest rates, the exchange rates, inflation, GDP gap, and real effective exchange rate changes. To estimate the rules expressed by equations (2) and (3), the list of instrumental variables has been complemented to the same lags of additional variables included. All tests used to validate the over-identification restrictions (J-statistic) cannot reject the null hypothesis of meeting over-identification requirements. GMM weighting matrix was chosen according to Newey-West covariance estimator robust in the presence of heteroskedasticity and autocorrelation of unknown form.

The time horizon for the variables included in the form of expectations is considered equal (m = n = p = 3, 6, 12 or 24 months), and we only reported the best results in terms of quality and estimation outcomes. We constructed the model based on monthly data. The time span covers the following month the national monetary authority announced the transition to inflation targeting strategy in the case of the first four selected states, the month following the CBs adoption of a monetary policy strategy based on two pillars (similar to the ECB’s) in case of Slovenia, respectively the month following Slovakia’s announcement of applying an informal inflation targeting strategy. For the Eurozone, the analysis begins with the first month of 1999.


The variables included in the analysis are: short-term nominal interest rate as three-month interbank market interest rate (Euribor 3M for the Eurozone and its equivalents for selected countries), the inflation rate measured as annual change of the harmonized index of consumer prices (HICP fixed base 2005 = 100, seasonally adjusted using Census X12 procedure), the output gap (real GDP - potential GDP) as difference between the current value of seasonally adjusted industrial production index (2005 = 100 fixed-base) logarithm and the trend value given by Hodrick-Prescott filter (\( \lambda = 14400 \)), real effective exchange rate expressed as annual percentage change in the fixed-base index (2005 = 100) of real effective exchange rate (its increase translates into currency appreciation), stock market index (fixed base (2005 = 100) as annual percentage change, nongovernmental credit as annual percentage change.

In the literature, when forward-looking monetary policy rules are estimated by GMM, all variables are assumed to be stationary (inter alia, Clarida et al. (1998)). In our approach, contrary to the results (as the ADF test identified some variables to be integrated of order 1 (I(1)), we treated them as stationary, at least for the reason of maintaining the comparability of our findings with those obtained by other authors.

5. Results of monetary policy rules estimation

5.1. The estimation results of the Taylor rule for open economies
Estimation results of the Taylor-type monetary policy rule expressed by equation (1), rule with distinctive features in term of forward-looking nature, dynamics, the presence of inertia element (interest rate smoothing) and the inclusion of the exchange rate are shown in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Czech Republic</th>
<th>Poland</th>
<th>Romania</th>
<th>Slovakia</th>
<th>Slovenia</th>
<th>Hungary</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\rho$</td>
<td>0.939***</td>
<td>0.946***</td>
<td>0.866***</td>
<td>0.895***</td>
<td>0.855***</td>
<td>0.891***</td>
</tr>
<tr>
<td>$\alpha$</td>
<td>-0.068</td>
<td>-0.379</td>
<td>3.654***</td>
<td>4.072***</td>
<td>3.196***</td>
<td>2.288**</td>
</tr>
<tr>
<td>$\beta_\pi$</td>
<td>1.156***</td>
<td>1.874***</td>
<td>0.819***</td>
<td>0.561***</td>
<td>0.425*</td>
<td>1.139***</td>
</tr>
<tr>
<td>$\beta_y$</td>
<td>0.204***</td>
<td>0.795*</td>
<td>-0.647***</td>
<td>0.217**</td>
<td>0.521***</td>
<td>-0.311***</td>
</tr>
<tr>
<td>$\beta_s$</td>
<td>-0.083**</td>
<td>-0.042***</td>
<td>-0.231***</td>
<td>-0.254***</td>
<td>1.048***</td>
<td>-0.121**</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.991</td>
<td>0.995</td>
<td>0.903</td>
<td>0.966</td>
<td>0.849</td>
<td>0.876</td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.163</td>
<td>0.305</td>
<td>0.981</td>
<td>0.453</td>
<td>0.548</td>
<td>0.655</td>
</tr>
<tr>
<td>DW-statistic</td>
<td>1.299</td>
<td>1.394</td>
<td>1.876</td>
<td>1.564</td>
<td>2.040</td>
<td>2.011</td>
</tr>
<tr>
<td>J-statistic</td>
<td>0.071</td>
<td>0.070</td>
<td>0.069</td>
<td>0.012</td>
<td>0.094</td>
<td>0.105</td>
</tr>
<tr>
<td>Prob(J-statistic)</td>
<td>0.686</td>
<td>0.673</td>
<td>0.986</td>
<td>0.846</td>
<td>0.976</td>
<td>0.552</td>
</tr>
</tbody>
</table>

Note: *, **, *** significant variables at 1 %, 5 %, respectively at 10 %
Source: author’s estimation

Estimation of the Taylor-type monetary policy rule for the euro area led to the following results: $\rho = 0.971***$; $\alpha = -1.445$; $\beta_\pi = 1.973**$; $\beta_y = 1.563***$; $\beta_s = 0.134**$ with R-squared = 0.989, S.E. of regression = 0.139, DW-statistic = 1.097, J-statistic = 0.089 and Prob(J-statistic) = 0.516.

From the perspective of estimation quality, results presented in Table 1 are relatively satisfactory (high R-squared values, relatively low standard error of regression, Durbin-Watson statistic with a value greater than the corresponding R-squared). Durbin-Watson statistic less than 1.5 in some cases indicate, however, a number of problems related to serial correlation of errors.

Regarding the estimation results, first, we note that all values returned for $\beta_\pi$ coefficient are statistically significant. Second, we identified coefficient values above par for inflation deviation from the target for the Czech Republic, Poland, Hungary and the euro area and a close value to the unit threshold in the context of Romania. Therefore, in all these cases, the Taylor principle is valid, so that a stabilizing monetary policy should increase the nominal interest rate to a greater extent (more than proportionally) than inflation (Woodford, 2001).

The high values of the inflation gap coefficient compared with those related to other macroeconomic variables considered indicate a strong orientation of selected states CBs towards their fundamental objective of maintaining price stability. This finding also appears to be obvious for the euro area, as the ECB commitment to stability is widely recognized, a fact confirmed by $\beta_\pi$ high value, of 1.93.

The coefficients estimated for the output gap proved to be statistically significant for all the analyzed countries, but countreintuitive (of opposite sign) for Romania and Hungary. ECB seems to be strongly oriented towards stabilizing the GDP gap, but we also identified a clear predisposition of the monetary authorities to the enhancement of the real economic activity in Poland, Slovenia, the Czech Republic and Slovakia by applying a flexible inflation targeting strategy. This finding, however, is not likely to jeopardize the inflation target, as $\beta_y$ values are usually much lower than the corresponding $\beta_\pi$ ones.

Inertia coefficients $\rho$ (interest rate smoothing) obtained are significant in all cases, but the estimates returned are too high to be plausible. Although central banks in the analyzed states have undoubtedly tried to
reach a compromise between aggressive changes in the interest rate to avoid the emergence of instability in financial markets, on the one hand and strengthening the credibility of monetary policy on the other hand, gradual adjustments seem too slow.

The importance given by national monetary authorities to the exchange rate stability is evidenced by the values obtained for the $\beta_s$ coefficient. In its case, the values are found to be statistically significant for all countries subject to analysis, identifying a counterintuitive outcome for Slovenia. In Romania, Slovakia and Hungary, the position of national central banks towards stabilizing the exchange rate through short-term nominal interest rate appears to be obvious, while for the Czech Republic and Hungary, estimated $\beta_s$ values (although of correct sign) seem to have only a limited importance for the monetary policy decision making. This finding for the two states is surprising, given that they are economies with a high degree of openness.

5.2. The estimation results of the Taylor rule for open economies acceding to the Eurozone

The focus on estimating a monetary policy rule that takes into account country specific factors of selected economies acceding to the Economic and Monetary Union (equation 2) leads to the results presented in Table 2.

Table 2: The estimation of a Taylor-type monetary policy rule that considers CEE countries characteristics of emerging states with a high degree of openness, in the process of convergence towards the euro area.

<table>
<thead>
<tr>
<th></th>
<th>The Czech Republic</th>
<th>Poland</th>
<th>Romania</th>
<th>Slovakia</th>
<th>Slovenia</th>
<th>Hungary</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\rho$</td>
<td>0.929***</td>
<td>0.939***</td>
<td>0.799***</td>
<td>0.893***</td>
<td>0.853***</td>
<td>0.919***</td>
</tr>
<tr>
<td>$\alpha$</td>
<td>-0.808***</td>
<td>-2.044***</td>
<td>3.694***</td>
<td>1.829*</td>
<td>2.317</td>
<td>3.426***</td>
</tr>
<tr>
<td>$\beta_\pi$</td>
<td>0.701***</td>
<td>1.622***</td>
<td>0.586***</td>
<td>0.361***</td>
<td>0.402**</td>
<td>0.603**</td>
</tr>
<tr>
<td>$\beta_y$</td>
<td>0.092***</td>
<td>0.457***</td>
<td>-0.239***</td>
<td>0.119***</td>
<td>0.494***</td>
<td>-0.179**</td>
</tr>
<tr>
<td>$\beta_s$</td>
<td>-0.094**</td>
<td>-0.052**</td>
<td>-0.439***</td>
<td>-0.171***</td>
<td>0.978***</td>
<td>-0.222**</td>
</tr>
<tr>
<td>$\beta_i^{EUR}$</td>
<td>0.713***</td>
<td>0.905***</td>
<td>1.002***</td>
<td>0.840***</td>
<td>0.320</td>
<td>0.683*</td>
</tr>
</tbody>
</table>

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R-squared</td>
<td>0.992</td>
<td>0.996</td>
<td>0.914</td>
<td>0.969</td>
<td>0.849</td>
<td>0.877</td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.127</td>
<td>0.289</td>
<td>0.926</td>
<td>0.436</td>
<td>0.555</td>
<td>0.654</td>
</tr>
<tr>
<td>DW-statistic</td>
<td>1.404</td>
<td>1.480</td>
<td>1.833</td>
<td>1.768</td>
<td>2.035</td>
<td>2.050</td>
</tr>
<tr>
<td>J-statistic</td>
<td>0.093</td>
<td>0.081</td>
<td>0.149</td>
<td>0.127</td>
<td>0.101</td>
<td>0.109</td>
</tr>
<tr>
<td>Prob(J-statistic)</td>
<td>0.720</td>
<td>0.882</td>
<td>0.903</td>
<td>0.788</td>
<td>0.997</td>
<td>0.815</td>
</tr>
</tbody>
</table>

Note: *, **, *** significant variables at 1 %, 5 %, respectively at 10 %
Source: author’s estimation

The additional inclusion of the convergence process in the central bank reaction functions of selected countries does not significantly alter previously obtained results. The primary focus of the monetary authorities in the region remains on narrowing the inflation gap, fully in line with their strategy of inflation targeting. Such a monetary policy strategy is not applied in its strict form, allowing for the stabilization of real activity and of the exchange rate.

But what is brings new to the estimation of the monetary policy rule in this embodiment, is that in all states in the region (except for Slovenia, where $\beta_i^{EUR}$ coefficient is not statistically significant), the adjustments of the benchmark interest rate closely follow changes in the Eurozone short-term nominal interest rate. Convergence in the pace of the monetary policy interest rates in the CEE region towards the euro area is high in all cases and
maximum for Romania.

5.3. The estimation results of the Taylor rule including financial stability – related factors

Taylor-type monetary policy rule proposed in equation (3) includes in addition to the exchange rate, two other additional variables represented by the annual change in the stock market index and the annual growth of nongovernmental credit. The results of GMM estimation of the monetary policy rules are presented in Table 3.

Table 3: Estimation of the Taylor-type monetary policy rule for CEE highly opened economies including elements of financial stability

<table>
<thead>
<tr>
<th></th>
<th>The Czech Republic</th>
<th>Poland</th>
<th>Romania</th>
<th>Slovakia</th>
<th>Slovenia</th>
<th>Hungary</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \rho )</td>
<td>0.938***</td>
<td>0.943***</td>
<td>0.788***</td>
<td>0.853***</td>
<td>0.908***</td>
<td>0.870***</td>
</tr>
<tr>
<td>( \alpha )</td>
<td>-0.263</td>
<td>-0.846</td>
<td>4.928***</td>
<td>5.972***</td>
<td>14.979*</td>
<td>3.836***</td>
</tr>
<tr>
<td>( \beta_\pi )</td>
<td>1.128***</td>
<td>1.975***</td>
<td>0.503***</td>
<td>0.222***</td>
<td>0.129</td>
<td>0.636***</td>
</tr>
<tr>
<td>( \beta_y )</td>
<td>0.134***</td>
<td>0.525**</td>
<td>-0.233***</td>
<td>0.015</td>
<td>0.490*</td>
<td>-0.198***</td>
</tr>
<tr>
<td>( \beta_s )</td>
<td>-0.088***</td>
<td>-0.005</td>
<td>-0.224***</td>
<td>-0.066</td>
<td>1.607**</td>
<td>-0.067</td>
</tr>
<tr>
<td>( \beta_b )</td>
<td>0.016***</td>
<td>0.014</td>
<td>-0.037***</td>
<td>-0.018***</td>
<td>-0.058</td>
<td>-0.010</td>
</tr>
<tr>
<td>( \beta_c )</td>
<td>-0.009</td>
<td>-0.027</td>
<td>0.040***</td>
<td>-0.075***</td>
<td>-0.453</td>
<td>0.082***</td>
</tr>
</tbody>
</table>

R-squared: 0.991, S.E. of regression: 0.161, DW-statistic: 1.338, J-statistic: 0.088, Prob(J-statistic): 0.888

The estimation of monetary policy rule that takes into account the financial stability component for Eurozone led to the following results: \( \rho = 0.971***; \alpha = -1.335; \beta_\pi = 1.215*; \beta_y = 1.068***; \beta_s = -0.017; \beta_b = 0.082**; \beta_c = 0.209* \) with R-squared = 0.990, S.E. of regression = 0.132, DW-statistic = 1.148, J-statistic = 0.088 and P(J-statistic) = 0.924.

The results confirm once again the importance of achieving and maintaining price stability objective. In parallel and without endangering the fundamental objective, it seems obvious that central banks of selected countries include in their reaction function the stabilization of the aggregate output and the exchange rate. It should be noted that the monetary policy stance of CBs in the region of ensuring financial stability can be determined by mere identification of exchange rate role under the considered monetary policy rule. This approach appears to be justified if we take into account the characteristics of selected CEE states in terms of their high euroisation level and currency mismatch of financial institutions assets and liabilities, so that the depreciation of the national currencies endangers the financial stability.

In a general approach, monetary policy applied by the countries of Central and Eastern Europe focused on inflation targeting does not include, however, developments in financial asset prices and private credit as driver of price bubbles. \( \beta_b \) estimates have not proved statistically significant in the case of Poland, Slovenia and Hungary and of opposite sign for Romania and Slovakia. At the same time, the values of \( \beta_c \) are also statistically insignificant in the Czech Republic, Poland, and Slovenia and of opposite sign for Slovakia. According to the results, the Czech national monetary authority appears to be the only one to consider the
evolution of financial asset prices, while central banks in Romania and Hungary have sought to limit, through the promoted monetary policy, the uncontrolled expansion of private credit. By contrast, the analysis of the European Central Bank behavior in setting interest rates, aimed at ensuring financial stability, underlines that the bank has considered both changes in the prices of financial assets and the evolution of private credit.

6. Conclusions

The estimation of the monetary policy rule with the insertion of country specific factors of highly opened economies in the CEE region has showed the commitment of the monetary authorities to maintain price stability. Inflation targeting strategy does not appear, however, to be used in its strict version, which allows for the stabilization of the economic activity and the real exchange rate. Thus, in the cases of Poland and the Czech Republic and also of Slovakia until it acceded to the euro area, we note the application of an inflation targeting strategy in a flexible form, compatible with the stabilization of the real economic activity. The analysis has revealed similar findings in terms of stabilizing the exchange rate through short-term nominal interest rate especially in Romania, Slovakia and Hungary.

Estimation of the monetary policy rule additionally taking into account the specificity of selected CEE states in the process of convergence towards the euro area led to similar results. Thus, the primary focus of the monetary authorities in the region remains the narrowing of the inflation gap, fully in line with the adopted strategy of inflation targeting. Such a monetary policy strategy is not applied in its strict form, allowing for the stabilization of real economic activity and of the exchange rate. In addition, the forecast of a Taylor-type monetary policy rule in this shape revealed that changes in short-term interest rates determined by the central banks of selected CEE states closely followed changes in Eurozone short-term nominal interest rate.

Introducing in the monetary policy rule of certain components related to financial stability has led to results that reflect the maintaining of monetary policy stance in selected CEE countries of the fundamental price stability objective in a flexible manner, accompanied by the simultaneous stabilization of aggregate production and of the exchange rate. The stance of monetary policy to prevent asset price bubbles in stock markets appears to be present only in the Czech Republic, while the prevention of excessive credit growth through monetary policy interventions has been identified in cases of Romania and Hungary.

References


