CONVERGENCE IN THE MONETARY POLICY STANCE DURING THE PRE-EMU PERIOD
CASE OF CZECH REPUBLIC AND POLAND

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Abstract
Monetary policy stance assessment is an important subject for both economists and policymakers. The literature offers vast variety of methods in this regard. The main weakness of most of them is that they are biased by a country-specific factors and are not useful for cross-country studies. The need for comparisons of national monetary policies stance at the regional and global level results from ongoing financial and monetary integration. Author proposes a simple theoretical framework for monetary policy stance assessment founded on the demand-supply approach. Then it is used to recognize increasing monetary policy integration of Czech Republic and Poland. The empirical study offers a hint about future EMU accession of both countries. High positive correlation of monetary policy stance between Czech Republic and Poland suggests that these countries are converging not only in business cycle but also in the way economy reacts to monetary impulses and external shocks. Similarity in reaction of a national private sector to monetary impulses might be another OCA criterion.

Keywords: monetary policy stance, monetary policy, monetary union, OCA.

JEL codes: E4, E5.

1. Introduction

For a successful monetary union several conditions are supposed to be met. Aside from classical OCA theory criteria covering those by Mundell (1961), Kennen (1963) and McKinnon (1964), contemporary literature offers some new and more institutional in nature. They are proposed for cases when member countries do not meet optimality criteria in the classical sense. However, the common thread of all of them is that they are aimed at increasing positive correlation of business cycles in union economies or at preventing

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divergence in this matter. Only then common monetary policy is well suited for all at the same time and is not a source of asymmetric shocks itself, that would be causing divergence in cycle phases.

It can be argued that national monetary policy conducted in a similar institutional framework in two or more countries should be similar in its stance, as long as business cycles in these countries are highly positively correlated. Using very simple and intuitive tools convergence of Czech Republic and Poland will be revealed. When analysing the monetary policy in both countries, an innovative method for measurement of its stance will be used. The main hypothesis in this paper is that after transformation period, Czech Republic and Poland became increasingly integrated. It could be a direct result of trading with each other and an indirect by developing international business relations with the same EU partners. Thus business cycle became more correlated in both countries and we can observe it with increased convergence in monetary policy stance. Topic that requires further investigation is the difference that remains in the relationship between money stock and GDP between Czech Republic and Poland.

2. How to measure monetary policy stance?

The concepts of capturing monetary policy stance discussed below are closely related to procedures of setting and tools of implementing monetary and exchange rate policies. Institutional framework is therefore crucial for measuring monetary policy stance.

American literature offers vast variety of restrictiveness measurement tools. One can recognize here simple indicators based on rates of change in monetary aggregates, non-parametric methods or indices based on both qualitative and quantitative inputs.

The first methods used to assess monetary policy stance were based on rates of change in money supply. However, Bernanke and Mihov (1995) argue that this approach is not appropriate. This is because these variables depend on a numerous count of factors beyond any direct or indirect influence of a central bank. Another problem with this group of methods flows from changes in the velocity of money circulation due to technological innovations. Therefore assessment of monetary policy stance in the long run can not be based on this approach. Reynard (2007) argues however that departure from money supply information results in rejecting very important information not included in any other indicator or method. This paper will build on this approach and will develop further suggestions formulated in
Reynard (2007) regarding money velocity short-term changes. This approach offers both qualitative and quantitative information about monetary policy transmission processes.

If the recognition of a monetary policy stance is not the end of itself but serves in further, in-depth studies of interactions between a central bank, households, firms and banking sector, the quantitative indicators offered by Romer and Romer (1989) or Boschen and Mills (1991) seem inappropriate. In case of Romer and Romer (1989) this is an evident return to approach offered by Friedman and Schwartz (1963). Reading documents of monetary policy setting body researchers recognize nature and scope of all changes. As an innovative extension one can note an attempt to separate shocks in money supply and money demand. There is another virtue of Romers’ approach since this is a non-parametric method. It means that there is no need for modelling the way decisions about the monetary policy are made or a way a financial system of an economy operates. However, despite of the evident subjectivity of this approach, Shapiro (1994) and Hoover and Perez (1994) undermine it with difficulty in classification of factors into dependent and independent from the central bank. This is the crucial distinction for any studies covering the monetary policy influence on the real economy. Analyzing documents of a policy-setting body one can recognize only moments in which a change took place. It is impossible to capture neither the strength nor the scope of those changes. Even the extension of this method proposed by Boschen and Mills (1991) by introducing 5-tier scale for restrictiveness is of no use when analyzing the monetary policy stance influence on real variables. The problem of subjective assessment still haunts this method from the very beginning. Romer’s approach is best when used as a cross-checking device. When other methods of monetary policy stance assessment are utilized, it is reasonable to test for their compliance with central bank’s intentions captured by Romers’ methodology. One have to remember however that sometimes intentions of a monetary authority are misplaced and result in opposite consequences than intended. Therefore this kind of cross-checking can be used for recognizing validity of central bank decisions.

Some analysts in Poland use a similar approach, but the basis for restrictiveness assessment are not documents of the Monetary Policy Council (MPC), since these documents are classified. Instead, public statements of the MPC members are used. In a periodical newspaper published by the ING Bank these statements and opinions are presented in two categories: doves & hawks. As the next step a subjective evaluation of the monetary policy stance and an expected evolution is offered (ING 2006). Despite it serves investors well in
short-term decisions it can not be used for thorough studies of the economy nor for suitability of monetary policy assessment nor in international comparisons.

An alternative approach to monetary policy stance assessment is based on indices composed of variety of inputs. The literature offers many ideas in this regard. Interested readers should refer to Bernanke and Mihov (1995), Bernanke and Blinder (1992), Bernake (1990), Christiano and Eichenbaum (1992), Eichenbaum (1992) and Strongin (1992). However, since they are strongly influenced by the way monetary policy is conducted and by characteristics of the financial sector they can not be used in case of Poland or Czech Republic.

Indices are present both in American and European literature, including the Polish one. Departing from monetary policy goals defined in terms of monetary aggregates growth rates and implementing inflation targeting required measurement of used tools influence on the price level. Central bank of Canada created a method that captures monetary policy stance in one number. According to Freedman (1994) this is how Monetary Conditions Index or MCI was born. The general concept is that this measure is a weighted average of changes in short-term interest rate and exchange rate. Two additional factors of supreme importance are: reference period and weights assigned to variables composing the index. Theoretically weights should reflect relative influence of interest rates and exchange rate on inflation or GDP growth. Which variable (inflation or GDP) is picked depends on the way monetary authorities’ goals are defined.

Among Polish authors there is a substantial contribution to disseminating MCI concept by Chwiejczak (1999). He presented briefly most important features and threats for this index-based approach. Franek (2002) articulated the nature of relationship between exchange rate, interest rate and monetary policy stance. This gave a hint that MCI method might be appropriate for transforming and emerging economies. The similar conclusion could have been formulated on the basis of Korhonen’s (2000) results for Central European economies. And there was Kot (2003a, 2003b) that followed the same path and proved high effectiveness of MCI for Czech Republic, Hungary and Poland.

Despite MCI is used as the main operating target of monetary policy (central bank of Canada) or a supporting tool (central banks of Norway, Sweden, New Zealand, Poland) already in 1996 some researchers questioned many of its assumptions. Eika, Ericsson and Nymoen (1996) proved that there is plenty of threats for appropriate MCI interpretation. These doubts were confirmed partially by Gerlach and Smets (2000) and Batini and Turnbull
(2000). Several conditions must be met in order to use MCI credibly in assessing the monetary policy stance. The problems with these conditions are of theoretical and empirical nature (Eika, Ericsson, Nymoen 1996):

- there is a difference in inflation and GDP dynamics in response to monetary policy,
- there is a different cointegration of time series of interest rates, exchange rate and dependent variables,
- parameters are not stable,
- some important independent variables are omitted when parameters are estimated and it results in improper dynamics, exogenity, cointegration and instability of parameters.

In addition none of the institutions using the MCI conducted causality tests (in Granger’s sense). Without this feature interpretation of estimated parameters as partial derivatives is not justified (Eika, Ericsson, Nymoen 1996, p. 21). The MCI framework is not appropriate for international comparisons since the weights depend on the national economy model used to estimate parameters. All these arguments challenge the MCI concept and vows for another measure of monetary policy stance for certain categories of research.

Another way used in assessing monetary policy stance is the Taylor rule, initially presented in Taylor (1993). These types of rules were used also to measure the monetary policy stance since they were descriptive and organizing tools for a monetary policy. The problem with the Taylor rule as an indicator for the monetary policy stance is that it depends on some unobservable variables, such as inflation gap or an output gap. Specification of the model used to assess these gaps shapes the results and therefore is not independent enough to be used in cross-country comparative studies.

3. **Velocity of money according to quantitative theory of money.**

The methods for assessing the monetary policy stance proposed so far are sensitive to specific institutional solutions and characteristics of an economy. There is however a method to recognize direction and size of the monetary developments, that is entirely independent. The concept is based on a specific interpretation of money velocity fluctuations in the short run. Traditionally, the relation in focus refers to an average amount of money and a value of transactions that are serviced by this money.

The velocity of money \(V\) is given by an equation derived from Fisher’s exchange equation:
\[ M \times V \equiv C \times P / : P \]
\[ V \times \frac{M}{P} = C / \left( \frac{M}{P} \right) \]
\[ V = \frac{C}{\frac{M}{P}} \]  

(1)

The equation (1) states that velocity of money circulation (V) depends positively on the real consumption spending (C) and conversely on the real money supply (M/P). Using nominal rather than real numerator that captures most of the transactions serviced by money stock requires usage of nominal money supply measures (M).

Barro (1984) claims that in calculating velocity of money, the GDP is used rather than the consumption spending (C). However, even this extension and modification is not consistent with theoretical foundations of this ratio (V). This is because the GDP covers only final goods and services. To assess the number of times money was used during a period one need to consider all transactions, including those at earlier stages in production processes. Another shortcoming, resulting in understating velocity of money when the GDP alone is used, flows from the fact that money in circulation services also trade in financial assets. Only after adding up these transactions one can conclude about velocity of money properly.

Bearing in mind these two arguments, calculation of the developments in money velocity in Czech Republic and Poland, brings the following paths.

Figure 2. Velocity of money in Czech Republic and Poland. Quarterly data 1995Q1 – 2005Q4.

The period covered by this study was the time of systemic transformation in both countries and post-crisis recovery in case of Czech Republic. In addition, transition from centrally planned to market economy witnessed technological changes in financial sector that are always perceived as velocity increasing factors. The nature of this kind of change is never sudden but gradual and long-term. Velocity of money in Poland was falling in the whole period. In case of Czech Republic one can recognize two periods: of speeding up money use 1995-1998Q3 and slowing it down 1998Q4-2006. Another significant difference is in the absolute level of velocity and its variability. Quantity of money in Czech Republic exceeds quite often the value of transactions that are supposed to be serviced by this money. The period 1995-98 can be interpreted as increasingly restrictive monetary policy, while the remaining period, because of expectations for decreased velocity, is associated with relaxing monetary policy. This is true for both countries.

4. An alternative interpretation for short-term fluctuations in money velocity as a monetary policy stance indicator.

Henry Thornton (1802) when formulated advices for successful central bankers referred indirectly to velocity of money. Directive no 3 says that monetary authority can allow for increasing money supply but it must be associated closely with the growth of trade volume (“in the Kingdom”). This should be interpreted as a rule of keeping the GDP/M ratio constant. Thornton (1802) allows for departures from this rule only in certain circumstances. Expansionary monetary policy was advised for periods when temporary increase in money demand was occurring. Restrictive stance, on the other hand, was perceived as an appropriate countermeasure for capital flight associated with dissatisfactory exchange rate. Therefore, a central bank without a good reason should keep the GDP/MONEY ratio constant.

Since downward trend for the GDP/MONEY relationship is inconsistent with expectations formulated with some assumptions about financial innovations and neutrality in monetary policy keeping this ratio constant – the observed developments reflect increase in money supply in relation to demand represented by the GDP. The only rational interpretation is the following. For all periods when the GDP/MONEY ratio falls, easing monetary policy should be recognized. The observed deviations from the trend are associated with periods of a more restrictive (upward movements) or a more expansive (downward movements) monetary policy.
This interpretation is an extension of an approach found in Reynard (2007). He treats short-term velocity movements as fully part of the monetary policy transmission process. This paper goes further in using money velocity to recognize monetary policy stance. For a convenient interpretation of the proposed indicator a simple adjustment is needed. To use the velocity of money as the monetary policy stance indicator it is reasonable to calculate first difference time series. It gives a precise information about the timing and the size of all changes in the monetary policy. The Indicator is presented in figure 3 and 4 for Czech Republic and Poland respectively.

Figure 3. Monetary policy stance indicator. First differences of velocity of money in Czech Republic 1995-2005


Increase in the value of the indicator means more restrictive policy when quantity of money decreases in relation to demand represented by the GDP. Drop in the level of this variable is always associated with relaxing monetary policy and monetary expansion in comparison to the previous period. Due to using quantitative input data it is possible to capture both the size and the relative strength of changes in the monetary policy stance.

The proposed indicator for assessing the monetary policy stance is based on money supply controlled by monetary authorities and on demand for money because of business transactions. Methods that were utilizing money supply only or rates of change of these aggregates were long criticized (Bernanke & Mihov 1995). Authors indicated the need to consider demand and supply together.
The idea presented above is an initial attempt but at this stage already can be used in research that requires precise timing and strength of monetary policy stance changes. Since this approach does not depend on any estimations nor institutional solutions it seems to be well suited for international comparisons of national monetary policy developments. It will be used for this purpose to test for convergence in monetary policy stance of Czech Republic and Poland.

5. Monetary policy convergence in Czech Republic and Poland.

Czech Republic and Poland belong to a group of economies that started systemic transformation at the beginning of 1990s. Initial situation was more or less the same, since the central planning was inefficient and resulted in economic and social problems. By the mid of 1990s the first and most important reforms were conducted in both countries. In addition, there was an important change in Czech Republic since it become a separate national entity after divorce with Slovakia. Reforms in Czech Republic resulted in a serious economic crises. The economy was recovering from it for several years. This kind of events were not seen in Poland, and it was perceived as a leader of market-oriented reforms. Since the first half of the 1990s was associated with significant redesigning of both economies it was dropped from the analysis. The consecutive years – 1995 – 2006 could be perceived as a time of arriving at a
market economy in both cases and maturing new institutional framework supporting economic and social reforms. This institutional framework includes, among others, the central banks and national monetary policies.

To test for convergence in the monetary policy stance in Czech Republic and Poland, a simple exercise was conducted. Correlation coefficients for a 6-quarter window was calculated for the 1995 – 2006 period. In a graphical form results are presented in figure 5. By the mid of 1999 it is impossible to recognize any signals of similarity in monetary policy stance. The reason for different monetary policy stance under the same institutional framework for monetary policy indicates differences in business cycle in both economies. This was the case, because Czech Republic was recovering for several years after a financial crises. However, after overcoming these crisis-driven problems and recovering from the recession one can observe a sudden change in similarity of the monetary policy stance (from 0 to 0.6) by the end of 2000. Since then, correlation is at this level with only one temporary departure when Poland was struck by a short recession in 2002.

Figure 6. Correlation of the monetary policy stance indicator in Czech Republic and Poland 1995-2005 for quarterly data (correlation for 8 quarter window).

Assuming the validity of the monetary policy stance indicator used one can capture not only a similarity in the way the monetary policy is conducted in two or more countries but also receive much information about economic trends in analysed economies. When we observe growth in correlation (2000-2006) after a period of low or negative values (1995-1999) it seems reasonable to conclude that both economies are converging in monetary policy.
stance. This means that under the same institutional framework for monetary policy, the underlying economic activity is also converging. The conclusion is that Czech Republic and Poland were increasing positive correlation also of business cycles. This process was an unintended result most probably of liberalization of all Balance Of Payments accounts and trading with the same partners (EU-countries: Germany in particular) and as well as with each other.

One can think of this convergence as a rationale for creating a monetary union, since the same policy serves both economies. Despite of classical OCA criteria, that are argued to be endogenous, and not included in any monetary union admission pre-conditions, convergence in monetary policy stance could be required before joining currency union. Under such directive, substituting national central banks by one common central bank would not be a source of a shock itself – since all unionised economies would be prior already subject to the same monetary policy (or a very similar one).

6. Conclusions

Contributing to a discussion about costs and benefits associated with a monetary union membership one has to remember that there is a set of preconditions for a successful currency union. When these preconditions are met there is a low probability of significant costs and most of the benefits materialize. One of the most important preconditions is the similarity in monetary impulse responses and high positive correlation of business cycles. Both these characteristics result in a common monetary policy that is well suited for the current economic conditions and is not a source of asymmetric shocks itself. To put it in other words – monetary policy is effective and does not cause a divergence among member economies.

Despite of initial compliance with all nominal admission criteria (Maastricht criteria) and converging in business cycle prior to joining the monetary union – it is possible to suffer from the common monetary policy after joining the EMU, if the economic agents react to monetary impulses in a different way. To test for being ready to join a monetary union one can use the exercise presented in this paper, based on the alternative interpretation of short-term money velocity fluctuations as a reflection of monetary policy stance changes. This allows for several important questions to be answered: (1) whether business cycles are correlated prior to admission, (2) is the monetary policy subject to convergence, (3) is the economy responding to monetary impulses in a similar manner as in other member states. When business cycles are correlated, the monetary policy is converging (in its stance) with
other member countries and the economy is responding in a similar way to monetary impulses then substituting national central banks with a common monetary authority would not result in any shocks or divergence.

This paper offers a first attempt to magnify the importance of a convergence in monetary policy stance prior to admission to a monetary union using a very simple and intuitive tool for measuring the monetary policy stance. The method based on the alternative short-term money velocity fluctuations interpretation offers both qualitative and quantitative information about the monetary policy stance. Since this method is not biased by any assumptions nor model-based parameters nor economy characteristics, it seems to be a convenient way of capturing monetary policy stance for international comparisons. Question number (3) posted in the preceding paragraph, despite not answered in this paper, draw attention of Sierpińska and Młodkowski (2007) where interested readers should find some more comments on similarity in business agents reaction to monetary impulses.

References


