

## **Monetary Policy Stance of the EMU Countries in the Pre-Integration Period**

### INTRODUCTION

Creation of a monetary union is not an aim for itself. Societies of interested territories are expecting that benefits flowing from a common monetary policy and currency will exceed any potentially associated costs. As a result, wealth of nations composing a monetary union will experience stable and sustainable growth. This is the most commonly recognized motivation for giving up an independent domestic monetary policy. But in order to make this true, national economies that are members of a currency union should meet some criteria. From the classical OCA theory point of view, these include free flow of labor or public transfers [Mundell, 1961] to deal with CA imbalance, openness to other member states [Mc Kinnon, 1963] and diversification of production structures [Kenen, 1969] to decrease importance and relative size of asymmetric shocks. The abovementioned criteria do not grant however that the common monetary policy is suitable for each member territory and the whole union. The problem lies in a way financial and real sectors respond to monetary policy instruments. There may be a case when all classical OCA criteria are met and monetary integration does not appear because agents in different member states react in the opposite manner when responding to monetary policy shocks. As a consequence a common central bank will be responsible for asymmetric shocks and for divergence in business cycle phases. It seems reasonable to introduce another criterion of optimality when currency areas are considered – similarity in private agents response to monetary policy instruments. In addition to this feature that is to be present for the whole life of any successful monetary union, a convergence in monetary policy stance in pre-integration period is a must. Only then substituting national central banks (NCBs) with the common one can be conducted without any debacles and the whole process will be smooth. Otherwise one-time adjustments of the real and financial sectors are natural but can have a detrimental impact on the perception of monetary integration. Convergence of long-term interest rates (as required in Maastricht Treaty) is not sufficient since it can be achieved in economies that react in an opposite manner or in different business

cycle phases leading to initial incompatibility of members and the common monetary policy.

The paper is organized as follows. Section II offers a review of methodologies developed so far for monetary policy measurement. Section III presents a simple method for assessing monetary policy stance for international comparisons. Section IV covers an empirical part in which convergence of monetary policy stance is tested in a group of countries that compose EMU. The last part (V) concludes both on methodology used and empirical results obtained.

### CAPTURING MONETARY POLICY STANCE. A LITERATURE REVIEW

When analyzing methods offered for measurement of monetary policy restrictiveness one can recognize case-sensitive approaches. Methods are country-specific and therefore do not allow for international comparisons. The monetary policy indicators start with very simple ones, based solely on monetary aggregates changes and cover non-parametric ones and indices based on qualitative and quantitative information.

According to Bernanke and Mihov [1995], the very first methods used to capture monetary policy stance were based on rates of change of monetary aggregates. Since these variables depend on a number of factors that are not controlled by a central bank, this simple methodology does not describe monetary policy stance appropriately. Another problem with this first group of methods is that we can observe changes in money velocity due to technological innovations and money stock can be influenced this way. This is only recently that more and more authors are indicating that rejection of information about money supply in assessment of monetary policy results in losing very important information [Reynard, 2007]. As will be shown later, focusing on an alternative interpretation of short-term shocks of money velocity offers an interesting alternative to all other methods.

When measuring monetary policy stance in any one country the aim of this exercise matters. When this recognition is not the end of itself but is used in in-depth studies of responses of agents to a central bank actions, then the quantitative indicators offered by Romer and Romer [1989] or Boschen and Mills [1991] seem inappropriate. Reading and subjectively interpreting documents issued by a central bank or monetary policy setting body is the basis for recognizing the nature of any changes in monetary situation. This approach was already used by Friedman and Schwartz [1963]. Hoover and Perez [1994] point out that it is difficult to divide factors shaping restrictiveness into categories of dependent and independent from the central bank. Analysis of documents of a monetary policy-setting institution allows only for indicating moments in which decision was made and has nothing to do with actual restrictiveness develop-

ments. It is not possible to recognize neither strength nor the scope of them. In addition, real sector behavior and its response can result in opposite changes in the actual monetary situation. Boschen and Mills [1991] introduced an extended 5-tier scale for evaluating monetary policy, but the core idea remained and subjectivity of this method is still present. It seems that the Friedman-Schwartz-Romer approach is very useful when cross-checking exercise is conducted. Therefore it can serve as a reference point for other methods because it offers not the monetary policy stance proxy but a reflection of the central bank's intentions. Since these intentions are sometimes misplaced they can contribute to unintended consequences and responses of agents.

Building indices to capture monetary policy stance is an alternative approach. One can find many competing methodologies within this group of methods. There are several that are most significant and used most often, including Bernanke and Mihov [1995] or Bernanke and Blinder [1992] or even Bernanke [1990]. The authors that were also developing indices to capture monetary policy stance cover Strongin [1992], Eichenbaum [1992] and Christiano and Eichenbaum [1992]. The most significant weakness of this index-approach is that components are very case-sensitive. This means that institutional design of the financial sector and central bank's instruments matter. Therefore these indices can not be used in international comparative studies because the underlying monetary systems are diverse. In such a setup any comparisons and conclusions would be meaningless. There is however another index-approach that requires some more elaboration due to its significance in defining and conducting monetary policies of many countries.

Implementation of inflation targeting and moving from money targeting required a method that would capture impact of monetary policy instruments on the general price level. It was the central bank of Canada that created and implemented for the first time the Monetary Condition Index (MCI). This is a simple approach in which two elements are merged: a weighted average of short-term interest rate changes and a weighted average of short-term exchange rate changes. Freedman [1994] stresses that there are two additional factors: a reference period and those weights associated with both variables used in compiling the index. From the methodological point of view, the weights should be adjusted according to each variable relative impact on inflation or GDP. It is up to the way goals of central bank are defined, which variable is chosen for the MCI compilation. This method is used by many central banks as the main or a supporting tool and target for monetary policy (Canada, Sweden, Norway, New Zealand, Poland). However, some researches undermined the MCI's correctness and showed that its assumptions are wrong [Eika, Ericsson and Nymoén, 1996]. These observations were later confirmed by other economists, including Gerlach and Smets [2000] and Batini and Turnbull [2000]. Credibility of the MCI is undermined because [Eika, Ericsson and Nymoén, 1996]:

- dynamics of a response of inflation and the GDP to monetary policy instruments are different,
- cointegration of interest rates, exchange rates and dependent variables is different,
- parameters are not stable over time,
- when parameters are estimated some important independent variables are omitted and this results in false dynamics, exogeneity, cointegration and the instability of parameters.

After analyzing publications that utilize MCI method to assess monetary policy stance and institutional utilization of this index it turns out that there were no causality tests conducted. It is not possible to interpret the estimated parameters as partial derivatives without this exercise [Eika, Ericsson and Ny-moen, 1996, p.21]. Again, the MCI belongs to methods that can not be used for international comparisons. This is because the weights depend on a model of the national economy that serves in estimating parameters.

The Taylor rule is also used for assessing monetary policy stance. It was for the first time presented by Taylor [1993] and gained wide recognition. However this method is based on two unobservable variables: inflation and output gaps. Therefore results obtained for one country are not comparable with those for other countries. This is because specification of models used for estimating both gaps is driving the final results.

As can be seen from the presented literature review, there is no method developed so far that is credible in capturing monetary policy stance for international comparisons. This is a very hot topic since financial integration and monetary integration has dominated contemporary research in international finance and macroeconomics.

### MONETARY POLICY STANCE INDICATOR (MPSI)

Henry Thornton [1802] defined basic rules for successful central bankers referring to velocity of money indirectly. One of his directives (No.3) states that money supply growth rate must be adjusted to the growth of trade volume. One can conclude that this is a prescription for neutral monetary policy, in other words – keeping GDP/M ratio constant. Departures from the neutral stance are best suited only for special situations. Monetary authority should increase money supply only when temporary increase in money demand is observed. The opposite policy, increase in restrictiveness is appropriate when capital outflows are observed together with dissatisfactory exchange rate. Otherwise GDP/MONEY ratio should be kept constant.

Using the velocity of money as a proxy for monetary policy stance allows for the following interpretation. When GDP/MONEY ratio increases it reflects relative lower money supply to money demand and therefore a restrictive mone-

tary policy. When the ratio falls, it means that there is an increase in money supply relative to money demand. One can interpret it as an expansionary monetary policy. But such short-term shocks to money velocity are observable only when monetary base (M0) is used for GDP/MONEY calculations. These short-term changes in V are fully part of the monetary policy transmissions process. To facilitate utilization of this approach, it is reasonable to introduce a time series of first differences of money velocity. It is suggested to use Monetary Policy Stance Indicator (MPSI) name for this method. This way we achieve a methodology that is describing the actual monetary situation and is independent from any previously mentioned characteristics that were shaping results obtained with other methods. Therefore it is appropriate to use this methodology for international comparative studies, which seek similarities or integration or convergence in monetary policy stance.

The MPSI brings information about timing, nature and relative strength of all changes in monetary situation. It is very important to remember that with this method one can test for efficiency of monetary authority. There can be a situation in which misplaced decisions about increase in restrictiveness result in expansionary monetary policy and vice versa. MPSI and Romer and Romer [1989] approach can verify actions of every central bank.

#### TESTING FOR CONVERGENCE IN MONETARY POLICY STANCE IN EUROPE

Convergence in monetary policy stance is something natural in the globalized world with full liberalization of all BOP accounts [Młodkowski, Sierpińska, 2007]. As long as the exchange rate regime is not a hard peg there is room for the independent monetary policy. But such policy appears only as a response to asymmetric shocks. Without asymmetric developments all economic integrated territories converge in terms of monetary policy stance. This is especially the case of countries heading toward currency union. Such convergence is not only a natural consequence of the previous integration but a necessity to avoid policy-induced shocks, when NCBs are substituted by the common one. Then, there is no problem for the new monetary authority what policy stance should be implemented at the inception of the union (table 1).

**Table 1. Convergence in monetary policy stance (R-restrictive, N-neutral, E-expansionary) prior to monetary union and substituting national central banks (NCB) by a common one (ECB)**

Year -4	Year -3	Year -2	Year -1	EMU Year 0
NCB <sub>1</sub> ; N	NCB <sub>1</sub> ; R	NCB <sub>1</sub> ; N	NCB <sub>1</sub> ; N	ECB; N
NCB <sub>2</sub> ; E	NCB <sub>2</sub> ; E	NCB <sub>2</sub> ; R	NCB <sub>2</sub> ; N	
NCB <sub>3</sub> ; R	NCB <sub>3</sub> ; E	NCB <sub>3</sub> ; E	NCB <sub>3</sub> ; N	

Source: author.

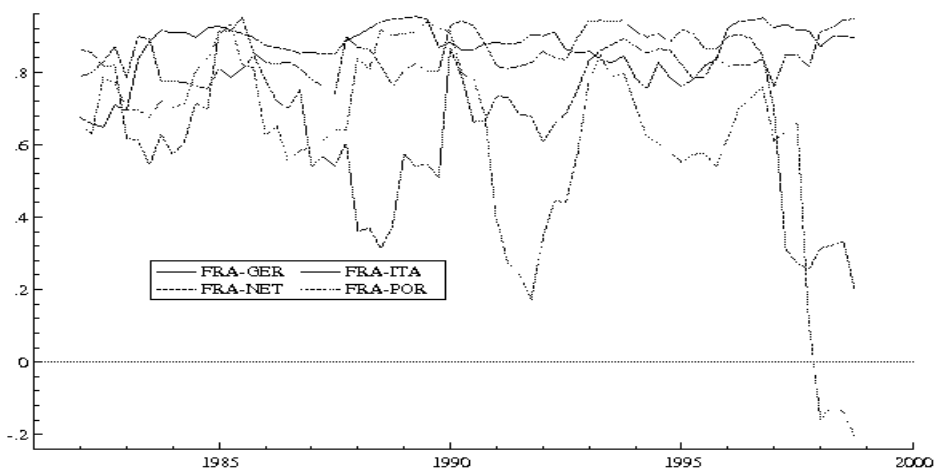
Despite of the differences in the monetary policy stance in the past (years – 4, –3, –2) all NCBs arrive at the same stance in a period preceding currency unification. If the new common central bank implemented policy resulting in different stance than the present one in all member states, it would be no problem. Each of the available stances would mean the same direction of monetary transmission. But if the situation prior to full monetary integration is described by table 2, then the common central bank would induce asymmetric shocks, no matter the policy implemented at the inception of monetary union.

**Table 2. Lack of convergence in monetary policy stance (R-restrictive, N-neutral, E-expansionary) prior to monetary union and substituting national central banks (NCB) by a common one (ECB)**

Year –4	Year –3	Year –2	Year –1	EMU Year 0
NCB <sub>1</sub> ; N	NCB <sub>1</sub> ; R	NCB <sub>1</sub> ; N	NCB <sub>1</sub> ; R	ECB; ???
NCB <sub>2</sub> ; E	NCB <sub>2</sub> ; E	NCB <sub>2</sub> ; R	NCB <sub>2</sub> ; E	
NCB <sub>3</sub> ; R	NCB <sub>3</sub> ; E	NCB <sub>3</sub> ; E	NCB <sub>3</sub> ; N	

Source: author.

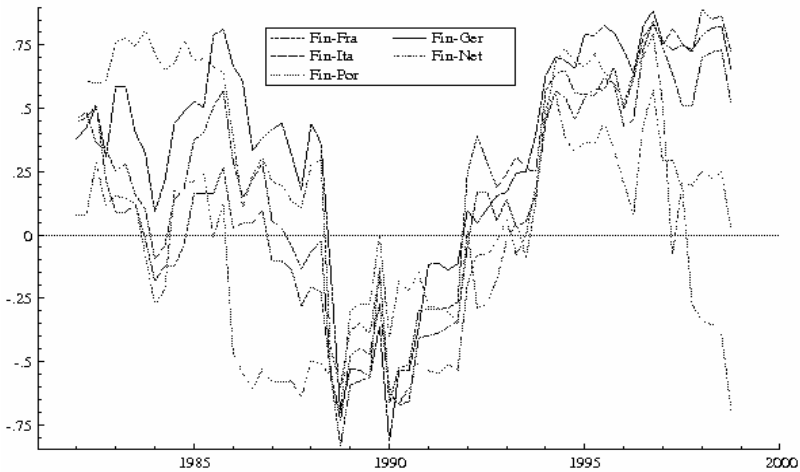
Now a question emerges: which of those two situations described the EMU countries best. In order to answer this question two empirical exercises were conducted. The first one is based on correlation coefficients calculated for pairs of countries for the period 1980–1998 using quarterly data and a 8-quarter moving window. This study revealed a significant convergence for most of the EMU countries.



**Figure 1. Correlation coefficient for Monetary Policy Stance Indicator (quarterly) for France and other European countries, with 8-quarter moving window 1980–1998**

Source: author.

As can be seen, there was always a very high positive correlation coefficient for monetary policy stance in France and the other concerned countries. Two other EMU countries (Netherlands and Portugal) diverged however significantly prior to full monetary integration. It is a signal that attempts to meet convergence criteria (prior to 1999) required in those two countries a quite different policy stance. Another suggestion is that, implementing the common monetary policy would mean for these countries a reversion in developments induced prior to the EMU membership. Divergence of Netherlands and Portugal is confirmed also when Finland's monetary policy is set as a reference point (figure 2).

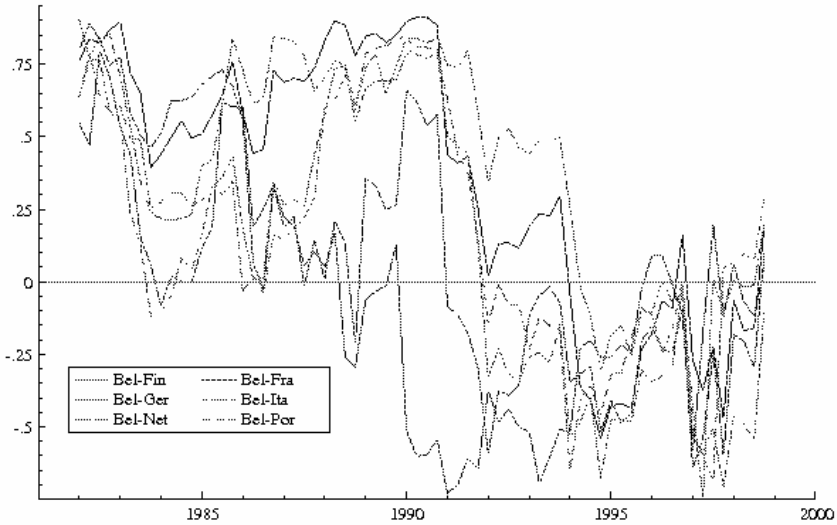


**Figure 2. Correlation coefficient for Monetary Policy Stance Indicator (quarterly) for Finland and other European countries, with 8-quarter moving window 1980–1998**

Source: author.

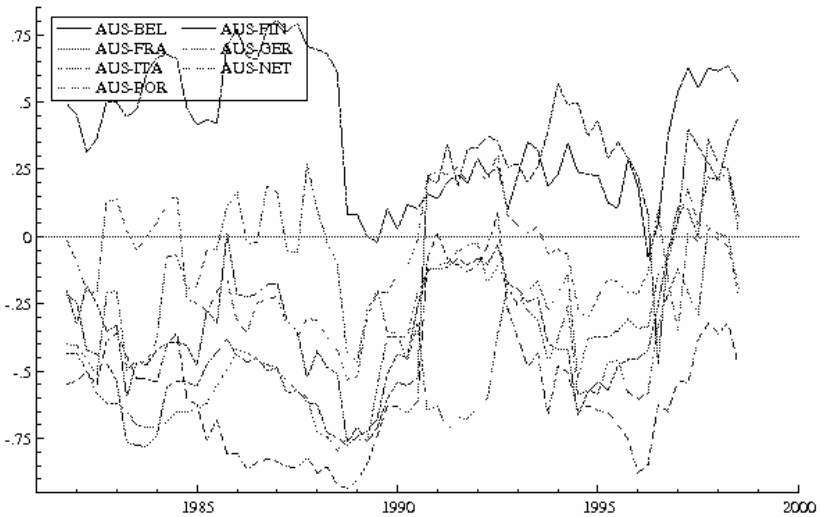
One can observe here quite a different pattern prior to Maastricht Treaty. Monetary policy stance developments in Finland were for the period 1980–1992 opposite than in other European countries. Then, when the decision about European monetary union was made, Finnish monetary policy stance converged with other prospect EMU members. Again a significant divergence can be observed for the same countries as previously.

Another interesting example is Belgium (figure 3). Monetary policy stance of this country was highly positively correlated for many periods in 80s. One could explain such behavior with the prevailing exchange rate regime among European countries. Despite many realignments, the fixed exchange rates and free flow of capital were imposing lack of independent monetary policy. Then there was a diametric change since the Maastricht treaty. High negative correlation reflected pursuing monetary policy of the opposite stance followed by arriving at correlation close to zero prior to the EMU.



**Figure 3. Correlation coefficient for Monetary Policy Stance Indicator (quarterly) for Belgium and other European countries, with 8-quarter moving window 1980–1998**

Source: author.



**Figure 4. Correlation coefficient for Monetary Policy Stance Indicator (quarterly) for Austria and other European countries, with 8-quarter moving window 1980–1998**

Source: author.



The next case is Austria and its unique pattern of correlation with 7 European countries. In contrast to Belgium, Austria was conducting an opposite monetary policy. It was similar only to Denmark, that stays outside of the formal EMU. For comparative considerations, the correlation with the UK was stressed (with bold line). One can observe that for the whole period in 80s, monetary policy of Austria and the UK were almost opposite in stance. But the same observation is true for almost all other countries. At the turn of the decades (80s/90s) correlation coefficient reached the values close to zero, which was observed also in Figure 2. But there was no convergence in monetary policy stance despite the Maastricht Treaty. It was only in 1997 and 1998 when a slight convergence appeared and divergence in some cases diminished in scope.

The second analytical exercise was based on VECM model for pairs of countries to test for cointegration of their monetary policy stance. All time series were stationary at 1% confidence level. ADF statistics are presented in table 3.

**Table 3. ADF statistics for quarterly MPSI in the period 1980–1998**

Country	t-ADF
Austria	-9.1512**
Belgium	-8.8748**
Finland	-12.042**
France	-19.201**
Germany	-10.609**
Italy	-13.783**
Netherlands	-18.849**
Portugal	-10.389**
Switzerland	-15.065**
UK	-13.781**

\*\* – hypothesis about nonstationarity rejected at 1% confidence level

Source: author.

Testing for the optimal lag revealed 1-quarter as the best solution, on the basis of three criteria, AIC, HQ, SC. Each model was estimated with a constant (entered unrestricted). Summary of the results is provided in table 4, covering only the EMU countries.

As was already recognized in the initial correlation analysis exercise, the most problematic country is Austria. This is the only country with the negative relationship (with France and Italy) when a structural model is concerned. All other countries show the positive cointegration of the monetary policy stance for the period preceding the EMU. Error correction vector is also different for Austria (and in two cases for Belgium), confirming previous observations.

**Table 4. VECM parameters for models estimated for pairs of countries, lag=1 quarter, constant**

Standardized beta eigenvectors							
	Austria	Belgium	Finland	France	Germany	Italy	Portugal
Austria		-1.8467	-1.3415	<b>4.9041</b>	-2.4947	<b>3.0216</b>	-20.035
Belgium	0.83302		-1.2157	6.4574	0.7993	0.76789	0.66627
Finland	2.1951	2.2953		6.3558	0.85885	2.175	0.55584
France	<b>4.9769</b>	-3.2789	-3.2849		-0.1865	-0.17	-0.18899
Germany	1.7453	-1.5365	-0.7701	-0.5838		-2.6803	-3.0728
Italy	<b>6.0649</b>	-4.0853	-5.1474	-1.3844	21.493		-0.43118
Portugal	2.4785	-2.955	-1.0894	-0.4234	2.6803	-0.2743	
Standardized alfa coefficients							
	Austria	Belgium	Finland	France	Germany	Italy	Portugal
Austria		-0.3214	-0.3958	<b>0.11377</b>	-0.3154	-0.16	-0.033082
Belgium	<b>0.48815</b>		-0.4002	<b>0.09236</b>	-0.6545	-0.45	-0.53855
Finland	<b>0.71224</b>	<b>0.71457</b>		-0.0512	-0.6745	-0.0303	-0.60095
France	-0.3819	-0.2533	-0.2646		-1.9411	-2.2296	-1.9377
Germany	<b>0.35523</b>	-0.836	-0.7485	-1.0658		-0.0251	-0.1074
Italy	-0.5378	-1.4064	-0.6467	-2.7906	-0.0653		-1.7621
Portugal	<b>0.05962</b>	-1.1279	-1.1784	-0.8457	-0.4184	-0.6826	
Long-run matrix							
	Austria	Belgium	Finland	France	Germany	Italy	Portugal
Austria		-0.3712	0.18436	0.34115	0.37891	0.37807	0.37894
Belgium	0.3297		0.17753	-0.3101	-0.1911	-0.1876	-0.16976
Finland	0.05828	-0.1715		0.03544	0.18648	0.17048	0.19636
France	-0.3418	0.10763	-0.2100		0.07147	-0.0749	0.13634
Germany	-0.2488	-0.0361	-0.3867	-0.4175		-0.1916	0.077384
Italy	-1.1198	0.02538	-0.6213	-0.4256	0.07826		0.45088
Portugal	-0.7101	0.35664	-0.4856	-0.2982	-0.2498	-0.3275	

Source: author.

## CONCLUSIONS

Convergence in monetary policy stance was absent in several of the EMU countries prior to full monetary integration. The most diverged were Austria, Belgium, Portugal and Netherlands. These countries fall into two categories. Austria and Belgium were generally less or negatively correlated in terms of monetary policy stance for the whole period covered by this study. Netherlands and Portugal were highly positively correlated with core EMU countries, but in the period directly preceding inception of the EMU we can observe a significant divergence. It is likely that striving to meet Maastricht criteria required a different monetary policy stance and this was the reason for the observed behavior.

As a consequence of their divergence (of all of four mentioned countries) any policy stance of the ECB at the inception of the EMU should have induced a monetary shock different from the one induced in other EMU countries. In one of the two groups (I: Austria+Belgium+Netherlands+Portugal; II: rest of the EMU) achieving the goals of the monetary policy was less effective. Considering an example, in extreme case – the ECB would be fueling inflation in one group, while containing it in the other.

There is still a question if the proposed MPSI describes monetary policy stance properly. But assuming this is a correct measure, additional conclusion could be offered. As a by-product of the presented research almost identical monetary policy was revealed for the UK and Switzerland. Both countries are open economies, their financial sectors are integrated and there are no restrictions for capital flows. A natural consequence is convergence in monetary policy stance in the absence of asymmetric shocks.

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### Summary

Effectiveness of a common monetary policy in a monetary union depends positively on the level of business cycle correlation. Lack of this similarity or explicit opposite reaction to monetary policy instruments could be a significant argument against common monetary policy. Classical OCA theory does not include this issue explicitly. One can however derive it from general concept of high positive (and sustainable) correlation of business cycles in member economies. Experience shows that despite of meeting classical OCA criteria, monetary integration does not appear. To test a hypothesis about the scope of similarity in monetary policy stance a simple cointegration analysis is conducted and VAR model (1980–1999) for pre-integration period is the basis for concluding about convergence in economic activity, monetary policy and responses of domestic agents to monetary impulses. It turns out that in several cases there was a significant divergence among EMU countries.

## **Konwergencja polityki pieniężnej krajów UGW w okresie przed integracją**

### *Streszczenie*

Efektywność wspólnej polityki pieniężnej w unii walutowej zależy dodatkowo od stopnia korelacji faz cyklu koniunkturalnego. Brak podobieństwa lub wprost odwrotna reakcja gospodarki na instrumenty polityki pieniężnej może być poważnym argumentem przeciwko członkostwu w unii monetarnej. Klasyczna teoria Optymalnych Obszarów Walutowych nie zawiera tego warunku w sposób jednoznaczny. Można go jednak wyprowadzić z ogólnej koncepcji wysokiej dodatniej korelacji cyklu koniunkturalnego krajów członkowskich. Praktyka pokazuje, że pomimo spełnienia kryteriów klasycznej OCA, integracja monetarna nie występowała. W celu przetestowania hipotezy na temat stopnia podobieństwa sytuacji w polityce pieniężnej w krajach, które utworzyły pierwotnie UGW, przeprowadzona została analiza w modelu klasy VAR dla okresu (1980–1999). Stanowi ona podstawę dla wnioskowania o stopniu konwergencji poszczególnych krajów w wymiarze nominalnym. Okazuje się, że w okresie tuż przed utworzeniem UGW niektóre z gospodarek członkowskich doświadczyły istotnej dywergencji w polityce pieniężnej, w stosunku do sytuacji panującej w pozostałych gospodarkach objętych badaniem ekonometrycznym.