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Wstęp

Z wielką przyjemnością oddajemy do Państwa rąk publikację pt. „Ekonomia”, wydaną w ramach Prac Naukowych Uniwersytetu Ekonomicznego we Wrocławiu. Opracowanie składa się z 65 artykułów, w których autorzy prezentują wyniki badań w czterech obszarach problemowych analizowanych na poziomie mikro- i makroekonomicznym.

Pierwszy obszar przedstawia rozważania dotyczące rynku pracy i instytucji rynku pracy, a także roli kapitału ludzkiego w gospodarce. Znalazły się tutaj wyniki badań na temat np.: roli urzędów pracy w przeciwdziałaniu bezrobociu, wpływu instytucji formalnych i nieformalnych na rynek pracy, zjawiska prekariatu, sytuacji kobiet na rynku pracy w dobie polityki równych szans czy pozycji absolwentów na europejskim rynku pracy. Drugi obszar dotyczy problemów makroekonomicznych współczesnych gospodarek, często ukazywanych w kontekście analizy sytuacji Polski na tle innych krajów unijnych. W tej grupie artykułów zaprezentowano wyniki analiz dotyczących m.in.: interwencjonizmu monetarnego i fiskalnego w warunkach wysokiego zadłużenia, polityki monetarnej i fiskalnej w krajach unijnych, ograniczeń wzrostu i rozwoju gospodarczego, innowacyjności i przedsiębiorczości, działalności badawczo-rozwojowej oraz roli kapitału intelektualnego kraju. Trzeci obszar tematyczny prezentowanej publikacji stanowią aspekty mikroekonomiczne, omawiając je np. dokonano analizy relacji podmiotów funkcjonujących na rynku, poddano ocenie przeobrażenia w sferze dochodów gospodarstw domowych czy opisano wpływ migracji na gospodarstwa domowe w Polsce. Czwarty obszar obejmuje zaś opracowania dotyczące fundamentów ekonomii, m.in. racjonalności człowieka w ujęciu *homo sustinens*, nowych paradygmatów rozwoju, refleksji nad metodologią nauk ekonomicznych, koncepcji kształtowania oczekiwań uczestników rynku czy analiz poglądów klasyków francuskich na temat podatków.

Książka przeznaczona jest dla pracowników naukowych szkół wyższych, specjalistów w praktyce zajmujących się problematyką ekonomiczną, studentów studiów ekonomicznych oraz słuchaczy studiów podyplomowych i doktoranckich.

Artykuły składające się na niniejszą książkę były recenzowane przez samodzielnych pracowników nauki, w większości kierowników katedr ekonomii. Chcielibyśmy serdecznie podziękować za wnikliwe i rzetelne recenzje, często inspirujące do dalszych badań. Oddając powyższą publikację do rąk naszych Czytelników, wyrażamy jednocześnie nadzieję, że ze względu na jej wszechstronny charakter spotka się ona z zainteresowaniem i przyczyni do rozpoczęcia inspirujących dyskusji.

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SIMULATION ANALYSIS OF THE DEGREE OF INADEQUACY IN THE SINGLE MONETARY POLICY FOR THE EU ECONOMY OUTSIDE THE EURO ZONE

SYMULACYJNA ANALIZA STOPNIA NIEADEKWATNOŚCI JEDNOLITEJ POLITYKI PIENIĘŻNEJ DLA UNIJNEJ GOSPODARKI SPOZA STREFY EURO

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Summary: The aim of the article is to conduct a simulation analysis of the degree of inadequacy in the European Central Bank (ECB) single monetary policy for the needs of the EU economy which has not joined the euro zone so far. The analyzed research problem is important from the perspective of a country with the so-called derogation of the Economic and Monetary Union. The status “with a derogation” means a formal commitment of a member country to adopt the euro as a single currency. Each economy of the countries with derogation will have to face the consequences resulting from the single monetary policy in the context of macroeconomic stabilization. The results of the conducted simulation may prove useful in the discussion which has already been going on for years on a particular moment at which an economy can join the euro area. The aim assumed and the main areas of the analysis connected with this aim determine the layout and empirical character of the article which consists of two parts. The first part defines the subject and time range of the conducted study and discusses the research method applied. The second part contains the results of the analyses of the degree of inadequacy in the ECB monetary policy to the economic conditions of a country from outside the euro zone. The main conclusions resulting from the conducted research procedure are formulated at the end the article.

Keywords: inadequacy of the single monetary policy, eurozone, Poland, European Central Bank.

Streszczenie: Celem artykułu jest przeprowadzenie symulacyjnej analizy stopnia nieadekwatności polityki pieniężnej EBC do potrzeb unijnej gospodarki, która jak dotąd, nie przystąpiła do strefy euro. Analizowany problem badawczy jest istotny z perspektywy kraju z tzw. derogacją Unii Gospodarczej i Walutowej. Status z derogacją oznacza bowiem formalne zobowiązanie kraju członkowskiego do przyjęcia wspólnej waluty euro. Każda z gospodarek krajów z derogacją będzie zatem musiała stawić czoła konsekwencjom wynikającym z jednolitej polityki pieniężnej w kontekście stabilizacji makroekonomicznej. Rezultaty przeprowa-

dzonej symulacji mogą okazać się przydatne w trwającej od lat dyskusji nad momentem przystąpienia gospodarki do strefy euro. Przyjęty cel i związane z nim główne obszary analizy zdeterminowały układ oraz empiryczny charakter artykułu. W tekście określono zakres przedmiotowy i czasowy przeprowadzonego badania, omówiono wykorzystaną metodę badawczą i zawarto wyniki analiz stopnia nieadekwatności polityki pieniężnej EBC do uwarunkowań gospodarczych kraju spoza strefy euro. Sformułowano w nim również najważniejsze wnioski wynikające z przeprowadzonego postępowania badawczego.

Słowa kluczowe: nieadekwatność jednolitej polityki pieniężnej, strefa euro, Polska, Europejski Bank Centralny.

1. Introduction

The subject of the conducted analyses is the inadequacy of the single monetary policy. This phenomenon is connected with the fact that the centralized monetary policy, effective at the level of the whole single currency area, is not necessarily optimal from the viewpoint of its individual member countries.¹ The reason why the single monetary policy does not match individual requirements of each economy is divergences of the structural and cyclical nature which exist between the economies. A consequence of those divergences are differences in the level of economic development and an the imperfect synchronization of their business cycles.

The countries at a higher (lower) level of economic development are characterized by a lower (higher) rate of economic growth and prices, lower (higher) decline of unemployment and smaller (bigger) external disequilibrium² than the average values of the above mentioned indicators registered at the level of the monetary union. Due to the fact that within the frameworks of the single monetary policy decisions are made on the basis of the economic situation of the whole group, this assumption implies that in the countries where the level of economic growth is much different from that of the whole group's, this policy may finally have a pro-cyclical, not stabilizing character. The single monetary policy may also exert a pro-cyclical influence on the economies characterized by a low degree of synchronization between their business cycles and the cycle of the group [Urbanowicz 2014a, p. 256].

In this context, a similar level of growth in the member economies and a high convergence between their business cycles are the condition to benefit from the

¹ The problems of asymmetric impact of the centralized monetary policy within the single currency area were already dealt with in 1977 by H.G. Grubel. See: Grubel [1977, p. 452]. More on that subject also in: Bukowski [2007, pp. 48-50], Sławiński [2008], Wójcik [2008, pp. 115-117], Rogut [2010], Ochrymiuk, Rogut [2010, pp. 36-37], Urbanowicz [2014b; 2014c].

² It is assumed that countries with relatively high GDP *per capita* are usually characterized by small external imbalances, due to the fact that the economic growth – progressing slower – does not require large imports from abroad, and also is created basing mostly on increasing exports. On the other hand, in countries with low levels of economic development, increasing imports for the needs of relatively fast progressing economic growth and only weakly expanded exports may result in relatively larger current account deficit.

single monetary policy. The fulfilment of those criteria increases a probability of an effective impact of the single monetary policy upon the process of macroeconomic stabilization, both at the level of the whole group and at the level of its member countries. In such a case the influence of the single monetary policy observed at those levels will be similar, both as regards its force and direction [Urbanowicz 2014a, p. 256].

The related literature contains many publications which quote the decrease of differences in GDP *per capita* (the process of real convergence) and a better and better synchronization of the business cycles as part of the consequences resulting from adoption of the single European currency, but the results of empirical studies do not seem to unequivocally confirm such opinions. Above all, those results indicate that operating inside the euro zone does not guarantee the acceleration of the real convergence [Lopez, Papell 2012; Borsi, Metiu 2013; Soares, Aguiar-Conraria 2014], and, apart from that, the course of business cycles in individual member countries is divergent in many ways [NBP 2009; Barczyk et al. 2010; Lee 2013]. Therefore, it seems that a varying effectiveness of the ECB single monetary policy in shaping the macroeconomic stability of the member states can be a derivative of the diversity in their economies [Urbanowicz 2015, p. 13].

The problems of inadequacy of the single monetary policy are present in theoretical considerations concerning the euro zone and the effectiveness of activities undertaken by the ECB. In the related literature one can also find attempts at measuring the phenomenon of inadequacy of the single monetary policy. The first analyses of this type had appeared even before the euro zone was created. An impulse to conduct those studies were doubts raised by some economists as regards the planned establishment of the monetary union consisting of considerably heterogeneous economies. Studies on the extent of inadequacy of the ECB monetary policy in individual member states were continued in subsequent years [Hayo 2006; Blanchard 2006; Flaig, Wollmershäuser 2007; Sturm, Wollmershäuser 2008; Lee, Crowley 2009; Lee, Crowley 2010; Van Poeck 2010; Reichenbachas 2013].³ Due to a different time range, spatial range and methodology, the conclusions differ and are not fully comparable. Nevertheless, all of those papers emphasize that the monetary policy implemented by the ECB was not equally adjusted to the needs of particular member states of the euro zone [Urbanowicz 2015, pp. 13-15].

The aim of this article is to carry out a simulation analysis concerning the degree of inadequacy of the ECB monetary policy to the needs of the EU economy which has not joined the euro zone yet. The analyzed research problem is significant from the perspective of a country with the so-called derogation of the Economic and Monetary Union (EMU).⁴ The status with a derogation means a formal commitment of a member country to adopt the common currency – the euro. Therefore, each

³ A detailed review of the studies on this phenomenon in the euro zone can be found in [Urbanowicz [2015, pp. 14-15].

⁴ Currently, Bulgaria, Croatia, the Czech Republic, Poland, Romania, Sweden and Hungary are the countries with a derogation of EMU.

economy of the country with a derogation will have to face the consequences resulting from the single monetary policy in the context of macroeconomic stabilization. The results of this simulation may prove useful in the ongoing discussion on the right moment for an economy to join the euro zone.

The aim of the article and the main areas of analysis it involves determine the layout and empirical character of the article which consists of two parts. The first part defines the time range, subject range and methodology of the conducted study. The results of the analysis concerning the inadequacy of the ECB monetary policy to economic conditions of the country from outside the euro zone are presented in the second part. The most important conclusions resulting from the study can be found at the end of the article.

2. Methodology of analysis: stages of research, subject range and time range

In order to accomplish the aim assumed, appropriate research methods and instruments had to be applied. The empirical part comprises two basic stages.

At the first stage the degree of inadequacy of the ECB single monetary policy to the economic situation of a country from outside the euro area was measured on the example of Poland. The basis for this empirical analysis was the so-called stress indicator, most frequently used in the studies on the inadequacy of the single monetary policy. It was defined by R. Clarida et al. in [1998] as a difference between the ECB's basic interest rate and the optimal interest rate for a given country which belongs to the euro area. The ECB basic interest rate is the interest rate on the main refinancing operations.⁵ The estimation of the optimal interest rate is usually performed by means of Taylor's rule for each of the economies under analysis.⁶ It is assumed that the optimal interest rate for Poland is the NBP (National Bank of Poland) reference rate established every month by the Monetary Policy Council, a body of Poland's central bank.⁷ A lower absolute value of the difference between the basic ECB rate and the optimal interest rate for a given economy indicate a higher degree of adjustment of the ECB's policy to the country-specific needs. A negative (positive) value of that difference means, in turn, that the ECB's monetary policy is excessively expansive (restrictive). The estimation of the degree of inadequacy of the ECB's single monetary policy to the Polish economic conditions was performed on the basis of historical series of the monthly data for the period from January 1999

⁵ The main refinancing operations are the most important open market operations conducted by the Eurosystem. They play a fundamental role in controlling interest rates, managing liquidity in the market and signalling the monetary policy stance [ECB 2011, chap. 3, points 3.1.2].

⁶ For more on Taylor's rule see: Taylor [1993].

⁷ NBP reference rate is the Polish equivalent of the basic interest rate of the ECB. This rate determines the profitability of basic NBP refinancing operations carried out within the framework of open market operations [NBP 2003, p. 20].

to July 2015. The analysis was started in the year when the single European currency was introduced into non-cash circulation and the ECB commenced the implementation of the single monetary policy.

The second stage of the study included an analysis of the relationship between the extent of maladjustment of the ECB single monetary policy to Poland's economy and the degree of convergence in the level of economic development plus the range of synchronization between the business cycle in the euro zone and the business cycle in Poland. As regards the level of economic growth convergence was evaluated by the difference between the GDP *per capita* in the euro area and in Poland.⁸ Convergence between the business cycles was estimated on the basis of the difference in deviations of the GDP indexes from the trend line for the euro zone and for Poland.⁹ Further on the correlation was examined between the index of stress and, subsequently, the convergence index of the economic growth and the convergence index of the business cycle.¹⁰ The study was conducted for the period quarter I 2002 – quarter I 2015 due to the availability of the series of data used in this part of the analysis. Calculations were performed using GRETL econometric software and the series of statistical data coming from the ECB, NBP, Eurostat and GUS (Poland's Central Statistical Office).

3. Results of the simulation showing inadequacy of the ECB policy to the Polish economy

The range of maladjustment of the ECB policy in Poland is presented in the figure showing how the stress index developed over time (Fig. 1).

Although alternating decreases and increases of the stress index are visible, it does not exceed the level of 0 over the whole period under analysis. Negative values of the stress index show an excessively expansive character of the ECB monetary policy as compared to the Polish economic conditions in the whole research period. Decreases (increases) in the stress index show the periods when, in terms of expansiveness, the maladjustment of the ECB policy to Poland's economic situation increased (decreased).

⁸ GDP *per capita* is one of the most important synthetic measures of a given country's prosperity.

⁹ The GDP time series reflect to a high degree the most important aspects of the cyclical process, informing both about changes in demand and in market supply.

¹⁰ The variable which is a difference between the deviation of the GDP index from the trend in the euro zone and in Poland was subject to normalization. It was regarded as a nominant, i.e. the variable for which there exists a certain "normal" level of points, evaluated positively from the viewpoint of the analyzed phenomenon and any deviations from that level (both upwards and downwards) are evaluated negatively. It was arbitrarily assumed that if the level of this variable is as close as possible to 0, it would be evaluated positively because this indicates a high degree of synchronization between both cycles under analysis. Therefore, in the process of normalization higher numerical values were assigned to the values closer to 0. For more on the normalization procedure of the point nominant see: Poczta-Wajda [2010].

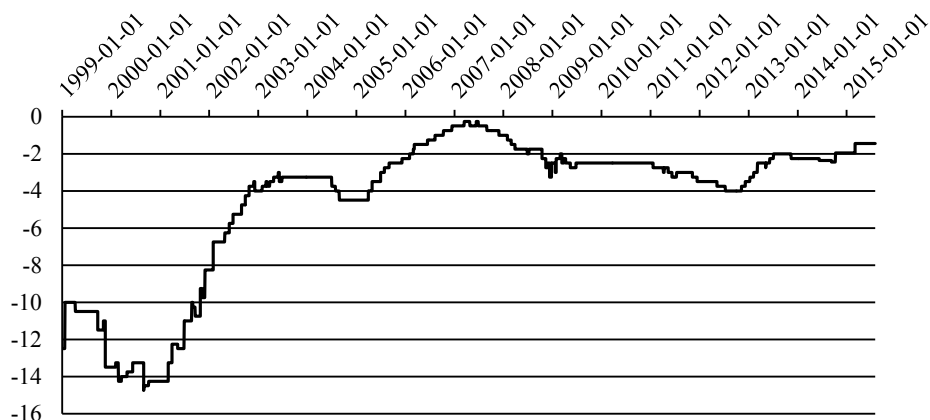


Fig. 1. Stress indicator in Poland in the years 1999-2015

Source: author's own elaboration based on the ECB and the NBP data.

Throughout the whole analyzed period three stages in the development of the stress index can be differentiated. The first stage, from January 1999 to the end of the year 2003, when the mismatch of the ECB policy was decidedly the biggest but was visibly decreasing in the course of time. The second stage, from the beginning of 2004 to mid-2007, which was characterized by a similar development tendency, except that it was in this period when the monetary policy's mismatch was decidedly the smallest (the stress index reached the values closest to 0). The last stage, starting in mid-2007 is a period when the effects of the current crisis were counteracted. In that time interval the inadequacy of the single monetary policy first increased and next the stress index started to approach the values closer and closer to 0.

At the first two stages the shaping of the stress index was most probably influenced by Poland's accession to the EU which involved the tightening of economic relations with the EU countries. The first stage is a pre-accession period when a gradual strengthening of trade relations with the EU countries began and was continued at the second stage when Poland became the EU member. For many years Poland's main trading partners have been, among others, Germany, France and Italy, present in the euro area from the start. Poland's progressive integration with the euro zone economies is the most probable reason why the degree of mismatch of the ECB monetary policy to the Polish economic conditions decreased over the first and the second stage. The reason why expansiveness-related mismatch of the ECB monetary policy to the Polish economic conditions initially increased at the third stage may lie in the fact that the ECB, in response to the crisis in the euro zone, started a cycle of interest rate cuts faster and to a higher extent than Poland's economic situation actually required from the NBP.

Studies on the relation between the inadequacy of the ECB monetary policy and diversities both in the level of GDP *per capita* and in the course of the business

cycles in the euro area and in Poland were preceded by the analysis of convergence of the level of economic growth and synchronization of the business cycles, estimated according to the adopted research method (Fig. 2).

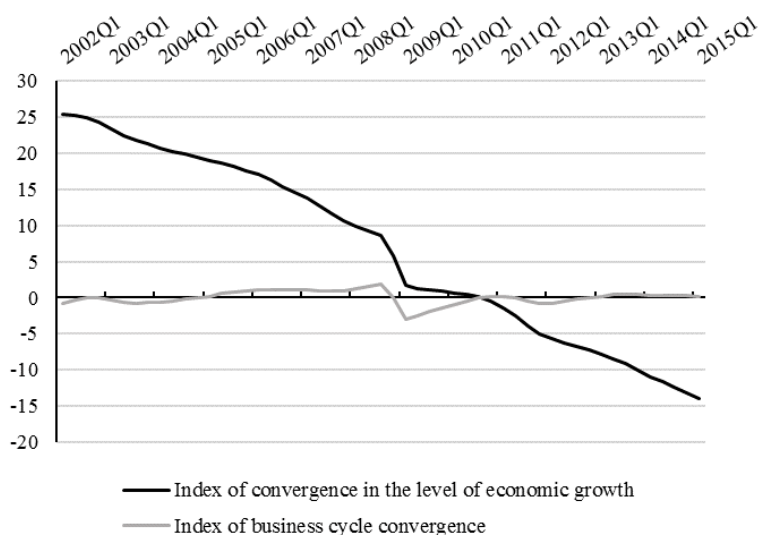


Fig. 2. Indices of convergence of economic growth and business cycle in the euro zone and in Poland in the period quarter I 2002-quarter I 2015

Source: author's own estimations based on Eurostat and GUS (Poland's Central Statistical Office).

From the beginning of the analyzed period the advantage of the euro zone over Poland in the level of economic growth was clearly decreasing in the course of time. The end of the year 2010 is a turning point when the GDP *per capita* in Poland started to reach higher values than in the euro area.

Periodical increases and decreases are visible in the index of business cycle convergence for the euro area and for Poland, which shows the lack of the full synchronization between the cycles in both of the analyzed currency areas. This indicator, however, reaches the values close to 0, which may testify to a high similarity in the course of the business cycle in the euro zone and in Poland.

The study of relationship between the inadequacy of the ECB monetary policy to Poland's macroeconomic situation and the degree of convergence in the level of economic growth plus the range of synchronization of the business cycle in the Polish economy with the euro area was based upon correlation analysis (Table 1).

In accordance with theoretical assumptions, the decreasing advantage of the economic growth in the euro area over Poland should result in the decreasing degree of excessive expansiveness of the ECB monetary policy towards the Polish conditions and vice versa. Therefore, the result obtained is convergent with the expectations because it indicates that the decreasing advantage observed in the level of economic

growth of the euro area over Poland's economic situation was accompanied by the increase in the index of stress which, as regards the degree of expansiveness, shows a decreasing mismatch between the ECB monetary policy and Poland's economic situation (and vice versa).

Table 1. Pearson's correlation between the stress indicator and the indices of convergence in the level of economic growth and business cycle in the period quarter I 2002-quarter I 2015*

	Stress indicator
Index of convergence in the level of economic growth	-0.3175
Index of business cycle convergence	-0.3574

Critical value (with a 5% critical area on both sides) amounted to 0.2706, for $n = 53$.

* This part of the analysis was conducted on the quarterly data and includes a narrowed time interval. This results from the fact that the series of data were only available on a quarterly basis in an incomplete research period from the Eurostat base.

Source: author's own elaboration, calculations performed in *GRET*L program.

In theory an increase in the degree of synchronization of the business cycle in the euro area with the cycle in Poland's economy should result in a decreasing maladjustment of the monetary policy to the Polish economic conditions (and vice versa). However, the obtained result concerning a correlation between the indices of stress and cycle convergence does not confirm such a character of that relation. The received value is negative, which means that an increasingly higher convergence between the analyzed business cycles was accompanied by a decrease in the index of stress that was translated into an increasing maladjustment of the ECB monetary policy, due to its excessively expansive character (and vice versa). Therefore, it seems that the range of synchronization of Poland's economy with the economy of the euro area still remains insufficient to ensure the adequacy of the single monetary policy to the Polish macroeconomic conditions. Moreover, in the conducted study the degree of synchronization was determined by using the GDP indices for the euro zone and for Poland. It may be possible that the increased degree of their synchronization did not translate in any significant way into the range of convergence of other macroeconomic variables, among others inflation and unemployment, which for the central banks are important determinants of decisions as regards the shaping of interest rates.

4. Conclusions

The results of the conducted simulation confirm that from the beginning of 1999 the ECB monetary policy has not been fully adjusted to the needs of Poland's economy. An earlier accession of Poland to the euro zone would probably involve high costs related to the phenomenon of inadequacy of the ECB single policy. Differences in

the level of economic growth in the euro area and in Poland, as well as an insufficient synchronization of the business cycles, seem to be the significant factors which determine the degree of inadequacy of that policy for Poland. However, on the basis of the results obtained, one can presume that although Poland, similarly to other euro area countries, will not manage to completely avoid the phenomenon of inadequacy of the single monetary policy after the accession to the euro zone, the actual costs related to that phenomenon should not be too high. This is indicated by the development of the stress index over time which is gradually achieving the values closer and closer to 0.

It seems interesting to extend the conducted analysis over other EU countries which will adopt the single currency in the future, in order to estimate the scale of inadequacy of the ECB monetary policy to the needs of their economies, compare the received results, draw conclusions which might be useful for a correct evaluation of the costs the phenomenon of inadequacy involves and to take them into account in the balance of benefits and costs connected with the accession to the euro zone.

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