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The Maastricht Convergence Criteria and Economic Growth in the EMU

ABSTRACT

The Maastricht convergence criteria are partially based on the theory of optimum currency areas and costs-benefits analysis of the creation of a single currency area as the EMU foundation.

Fulfillment of convergence criteria should be durable, but it requires a certain degree of real convergence between member countries of the monetary union.

The analysis of the economic role of the convergence criteria which has been carried out in this paper indicates that its implementation has been an important factor of macroeconomic stabilization for the EMU countries as well as for the countries planning accession to the Union.

On the basis of the theory of economics and results of empirical studies we cannot state univocally that the convergence criteria are a barrier to economic growth.

Naturally, this problem is controversial, but we can formulate a hypothesis that implementation of convergence criteria is an important factor of macroeconomic stabilization and sustainable economic growth.

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Introduction

The convergence criteria established by the Maastricht Treaty, obligatory for both full members of the European and Monetary Union (EMU) and member countries with a derogation, have been arising controversies among economists and economic politicians alike and in particular the criterion of fiscal stabilization. What gives rise to controversies is, first of all, the criteria's relative arbitrariness but also theoretical and practical (political) approach to such issues as: the role and goals of the state in economy, the question of macroeconomic stabilization and economic growth, the issue of exogeneity and endogeneity of the criteria of the optimum currency area. This paper is an attempt to answer to the question whether the convergence criteria adopted in the European and Monetary Union are the stabilizing factors or a barrier to the economic growth and whether their stabilizing influence is ineffective from the point of view of the theory of economics and theses of economic policy.

1. Nominal and real convergence in the theory of monetary union

There is no uniform theory of monetary union. It is composed, however, of theoretical approaches which are, to a large extent, complementary to one another but with reference to some issues they treat the processes of monetary integration in a completely different way. This section of the paper deals with the theory of optimum currency areas, cost and benefit analysis as well as hypothesis of endogeneity of the criteria of the optimum currency area. Each of these concepts and, in particular, the classical theory of optimum currency areas and the hypothesis of endogeneity of criteria of the optimum currency area were criticized which, however, does not diminish their essential explicatory and cognitive values.

In our further discussion, the monetary union shall be understood as a single currency area of uniform monetary policy implemented by a supranational central bank. The monetary union can be a source of significant benefits for the countries implementing it. These benefits are connected with the disappearance of the costs of currency exchange, disappearance of the exchange related risk in economic relationships between countries creating the union, price and employment stabilization and growth of real GDP.²

On the other hand, the countries forming the monetary union resign from monetary policies of their own (including currency exchange) as the instruments of macroeconomic stabilization. Thus, restoring economic equilibrium in the case of economic shocks can be based on the market mechanism of adjustments and, to some extent, on using the fiscal policy. The latter is not a very efficient or a refined instrument of macroeconomic stabilization and besides in the long and medium run it leads to increased budget deficit, public debt and higher interest rates.³

² On the subject of costs and benefits see: H.G. Grubel, *The Theory of Optimum Currency Areas*, „Canadian Journal of Economics”, May 1970, pp. 318-324; P.R. Krugman, M. Obstfeld, *International Economics, Theory and Policy*, Addison-Wesley Publishing Company, Massachusetts 2000, pp. 620-633; P. De Grauwe, *Unia walutowa*, PWE, Warszawa, 2003, p. 15-32; S. Bukowski, *Teoretyczne podstawy i realizacja unii monetarnej krajów członkowskich Wspólnot Europejskich. Szanse i zagrożenia dla Polski*, Wydawnictwo Politechniki Radmskiej, Radom 2003, pp. 65-66.

³ See: S. Bukowski, op.cit., pp. 61-62; P. Mortimer-Lee, *Czy Euroland może funkcjonować przy jednej stopie procentowej?* (in): P. Temperton (ed.) *Euro. Wspólna waluta*, Feldberg SJA, Warszawa 2001; P.R. Krugman, *Currencies and Crises*, The MIT Press, Cambridge, Massachusetts, London, England, 1999, pp. 201-202.

The theory of optimum currency areas points to the criteria which the economies of the countries creating the monetary union should meet. Meeting these criteria is considered indispensable to create the optimum currency area characterized by efficient functioning of adjustment mechanisms restoring economic equilibrium in particular countries and in the whole union as a currency area.

Such criteria include: high labour and capital mobility, both geographically and among sectors, openness of economies, diversification of production and flexibility of markets, prices and wages.⁴ What is more, it is pointed out and explained that the countries creating the monetary union should be characterized by a similar level of economic development, similar economic structures and similar tendency to inflation and similarity of inflation rates, convergent levels of budget deficit and public debt in relation to GDP and similar legal system.⁵ Also, the significance of the degree of economic integration and similarity, or plainly, synchronization of the economic cycles is emphasized.⁶

On the basis of the theory of optimum currency areas it can be concluded that the countries which differ much among one another with reference to the level of economic growth and mechanism of economy functioning should undergo the process of real convergence. The real convergence means here a process of deep structural and institutional changes in economy leading to convergence of integrating economies with reference to the level of economic development and mechanism of their functioning, the course of economic cycles and also convergence of the criteria of the optimum currency area.

J.A. Frankel and A. K. Rose are of a different opinion. They formulated the hypothesis of endogeneity of the optimum currency area criteria. According to them, historical data do not determine whether a country is a good candidate for the monetary union. Creation of a single-currency area (monetary union) releases mechanisms aiming at its optimization, i.e. achieving convergence of economies after some time, which would ensure their balancing and minimization of stabilization losses. Openness of economy plays the main role among the optimum currency area criteria. A high degree of openness of economies and facilitation of mutual trade by introduction of single currency leads to higher integration in the sphere of trade and, first of all, to more intensive intra-industry trade. Whereas the development of inter-industry trade based on comparative advantages favours differentiation of economic cycle among countries because economies are more sensitive to idiosyncratic shocks, specific for developed production branches, the development of intra-industry trade and its domination in mutual trade will lead to the increase in correlation

⁴ See: R.A. Mundel, *A Theory of Optimum Currency Areas*, „The American Economic Review”, Vol. 53, September, 1961; McKinnon, 1963; P.B. Kenen, *The Theory of Optimum Currency Areas: An Eclectic View*, (in) R.A. Mundell, A.K. Svoboda (ed.), *Monetary Problems of the International Economy*, Chicago University, Chicago 1970; P.De Grauwe, op. cit., pp.7-10; W.H. Buiter, *Macroeconomic Policy During a Transition to Monetary Union*, Centre for Economic Policy Research, No. 1222 August, 1995, pp. 30-31.

⁵ See: H.G. Grubel, *International Economics*, Homewood, Illinois 1977, p. 452; G.E. Wood, *European Monetary Union and the U.K. – A Cost-Benefit Analysis*, “Surrey Paper in Economics”, No 3, University of Surrey, Guildford, September 1973; G. Magnifico, *European Monetary Unification for Balanced Growth: New Approach*, Princeton University Press, Princeton 1971.

⁶ See: P.R. Krugman, M. Obstfeld, op. cit., pp. 622-630; J.A. Frankel, A.K. Rose, *The Endogeneity of the Optimum Currency Area Criteria*, CEPR, Discussion Paper Series, No 1473, 1997.

between economic cycles. This, in turn, is a factor leading to convergence of economic cycles. A high degree of integration in the field of trade (first of all, through the development of intra-industry trade) in the case of countries of relatively synchronized economic cycles should lead to transformation of idiosyncratic economic shocks (i.e. specific for a given economy) into the economic cycle coordinated on the international scale.⁷

However, it seems that even if we accepted the hypothesis about endogeneity of the optimum currency area criteria, the process of real convergence is, to some extent, indispensable, if the union is to be created by countries of different level of economic development. The very authors of this hypothesis emphasize that countries can be divided into those which are good candidates for the monetary union and those which should continue with autonomous monetary policy. They treat the level of synchronization of economic cycles as a criterion of this division. The countries of a lower level of the economic cycle synchronization with that specific for the countries of the created monetary union should use national monetary policies in order to stabilize economies.

Besides, deep structural and institutional changes are indispensable in the case when the economies of the countries planning to create the monetary union or join the existing one are characterized by relatively rigid markets, prices and wages, a relatively high inflation rate, and high budget deficit and public debt. The burden of adjustments in the case of economic shocks within the framework of the monetary union or in the case of individual member countries (asymmetric shocks) will rely mainly on the market mechanism. Thus, the above mentioned reforms should create conditions for efficient functioning of market adjustment mechanisms. Hence it is necessary to create institutional and structural conditions for flexible markets, prices and wages and reduce the level of market disturbances caused by fiscal policy and a negative influence of the excessive budget deficit and public debt.

2. Convergence criteria – their origins and significance

The idea of the convergence criteria (nominal convergence) adopted in the European and Monetary Union is, to some extent, a consequence of the postulates resulting from the theory of optimum currency areas.

Nominal convergence is expressed in attainment of specific macroeconomic indexes, close to the required ones, as the condition of joining the Economic and Monetary Union. Real convergence means durable structural adjustment of economy to the economies of the Union, which results in meeting convergence criteria and maintaining them which also means long-term macroeconomic stabilization. Thus, it is not only the effect of using the monetary and fiscal policies in order to achieve a short-term goal in the field of budget deficit, inflation and public debt.

There is a relationship between real convergence and durable maintaining of nominal convergence criteria.

⁷ See: J.A. Frankel, A.K. Rose, op. cit.

The real convergence processes should lead to macroeconomic stabilization and sustainable fulfillment of the nominal convergence criteria.

The nominal convergence criteria which must be met by the countries joining the Economic and Monetary Union were laid down in the European Union Treaty which is also known as the Maastricht Treaty.⁸ They include: price stabilization criteria, fiscal stabilization criterion, criterion of long-term interest rates and stabilization of the national currency exchange rate within the framework of the European Rate Mechanism II (ERM-II). Moreover, the criterion of fiscal stabilization was defined in the 1997 Stabilization and Growth Pact together with the sanctions for not fulfilling it by the member countries of the EMU and member countries with a derogation.⁹

The first criterion specifies the maximum inflation rate which cannot exceed the average inflation rate typical of three EU member countries of the lowest inflation by more than 1.5 percentage points.

The fiscal policy criterion provides that the top value of the budget deficit to GDP ratio cannot be higher than 3% and the public debt cannot exceed 60% of GDP.

The level of the long-term interest rate (interest on long-term bonds) in a given country cannot exceed by more than 2 p.p. the average percentage interest rate in 3 EU countries of the lowest inflation.

Last but not least, the country which is a candidate for the Economic and Monetary Union must introduce its currency to the ERM II. This means concluding an appropriate agreement with the Central Bank which puts the candidate country under the obligation to ensure full convertibility of the currency, making the central currency rate rigid in relation to the Euro and its stabilization within the fluctuation margin +/- in the period of at least 2 years without implementing devaluation.

The price stability criterion was adopted for several reasons. Firstly, it was feared (it was Germany which feared most) that in the future the Economic and Monetary Union would be inclined to inflation. Germany particularly insisted on adopting this criterion with the view of making the Union's future monetary policy analogous to that of the Bundesbank. In this way, the countries of low inflation wanted to protect themselves against the Union's central bank's policy, which could be based on preferences represented by the countries of high inflation. Moreover, it was assumed that the convergent low inflation rates in the Union countries would promote economic growth by decreasing uncertainty in economic activities. Convergence of inflation rates and maintaining them at a low level was also to limit the risk of social conflicts destabilizing economic life.

The fiscal stabilization criterion was based on similar premises as the price stability criterion. In the past, majority of countries joining the Economic and Monetary Union

⁸ See: *Treaty on European Union – Final Act*, 1992, europa.eu.int/abc/obj./treaties/en.entoco1.html; *The Euro: explanatory notes by Directorate General II – Economic and Financial Affairs*, Euro Papers, Number 17, February 1998.

⁹ See: *The Euro and the Economic Policy, Legal and Political Texts adopted by the Council of the European Union and the European Council*. General Secretariat of the Council of the European Union, January 1999, pp. 25-88.

had structural problems with budget deficits. Growth of budget deficits and public debt leads to the crowding-out effect of private expenditures on consumption and investment, which limits the long-run possibilities of economic growth. It is also the reason for maintaining high tax burden for population and enterprises. This, in turn, has an adverse effect on economy's effectiveness and international competitiveness. Undoubtedly, the introduction of this criterion contributed to acceleration of reforms of public finances in individual countries.¹⁰ On the other hand, it should be borne in mind that introduction of reference values in the form of a 3% share of budget deficit in GDP and the public debt share in GDP of up to 60% is arbitrary and is not justified by the theory of economics and economic practice. As P. De Grauwe puts it, these values result from a simple equation:¹¹

$$d = g \times b$$

where:

d – budget deficit (% in GDP),

g - nominal GDP growth rate,

b – level of stabilized public debt (% In GDP)

It can be easily noted that if $g = 5\%$, and $b = 60\%$ we obtain $d = 3\%$ ($0.03 = 0.05 \times 0.6$). The problem, however is, that if $g = 6\%$, then $d = 3.6\%$, etc. The very application of his formula is based on a wrong assumption that the economic growth rate will equal 5%. Moreover, the formula itself is burdened by the generalization error meaning that economic growth is dependent on the growth of budget deficit.. At the growth rate $g=6\%$ and maintaining the debt at the level of 60% of GDP, the budget deficit $d = 3.6\%$. It is a formula based on the simplified Keynesian model.

P. De Grauwe emphasizes that in the 1990s, in the EU countries the average value of the public debt share in GDP may have been at the level of 60% and that was the reason why this value was adopted as a reference index.¹²

These values were adopted due to the insistence of Germany. They were to prevent the situation in which the excessive growth of budget deficits and public debt would not lead to an increase in interest rates in the entire Union's area to the detriment of the countries of lower interest rates at the moment the Union was created. Germany was among those countries.

The criterion of a long-term interest rate resulted from the conviction that this particular rate is the symptom of sustainability of economic results in the sphere of price stability in individual countries of the Union. Moreover, reducing differences among interest rates allows to avoid arbitration in financial markets, especially in the period, when there are many currencies of rigid exchange rate. There was also a political reason. Germany was afraid that at a relatively lower interest on their treasury bonds in comparison to that in other EU countries, it would have problems with placing them in the financial markets.

The criterion of stabilization of the currency exchange rate means stabilization of exchange rates in the countries being candidates for the Economic and Monetary

¹⁰ On the subject of reasons and motives for introduction of convergence criteria and their economic significance see also: L. Oreziak, *Euro. Nowy pieniądz*, Wydawnictwo Naukowe PWN, Warszawa 2003, pp. 35-41.

¹¹ See: P. De Grauwe, *op.cit.*, pp. 147-148.

¹² Ibidem.

Union within the European Exchange Rate Mechanism II (ERM-II). The ERM-II was established by the decision of the European Council made in Amsterdam on 17 June 1997.¹³ Participation in the ERM-II is voluntary. The exchange rate mechanism is based on central exchange rates in relation to the Euro. The fluctuation margin from the central exchange rate is +/- 15%. The national central bank of a country from outside the Economic and Monetary Union joining the ERM-II concludes an agreement with the European Central Bank which regulates operational procedures concerning introduction of central exchange rates. It is also assumed that the country does not apply any currency-related restrictions. Stabilization of the given country's exchange rate within the ERM-II in the course of 2 years means that despite the lack of currency-related restrictions, the exchange rate is affected by minimum fluctuations around the central exchange rate. This proves a possibility of joining the single-currency area. Replacing such currency with single currency only confirms the naturally existing state of affairs.

Regardless of the causes which were behind introduction of the convergence criteria in the above described form and specific reference values, it cannot be stated unambiguously that they were irrational from the point of view of functioning of the created monetary union. It is worth mentioning that they somehow enforced economic reforms in the countries aspiring to join the EMU. The said reforms aimed at reduced inflation and fiscal stabilization.

Besides, the fiscal stabilization criterion introduced fiscal discipline in individual countries. It is commonly known that political objectives are not quite convergent with economic ones. In the post-war period, societies of the European Community (and post-communist countries) were accustomed to privileges resulting from social policy implemented in conformity with the concept of the welfare state and active intervention of the state in economy (subsidizing, protectionism, etc.). The election mechanism forced to politicians to retain the traditional social privileges and create new ones. This was in contradiction to long-term objectives of macroeconomic stabilization and economic growth and development. Introduction of reference values pertaining to budget deficit and public debt and sanctions for exceeding them stopped politicians in their plans to distribute the GDP and to some extent should make them think about creating conditions for generating it instead of distributing something which has not been generated yet.

3. Convergence criteria versus economic stabilization and economic growth

The consequences of convergence criteria for macroeconomic stabilization and economic growth should be viewed in the context of both the theory of economics and stylized facts.

Fiscal policy, in the broad sense of the word, means application of different instruments of the national income redistribution for attainment of fiscal and extra-fiscal objectives by the states. Fiscal objectives mean ensuring income to the state budget and broadly understood public sector and its distribution among different spheres of state activities defined by means of its functions in society and economy.

¹³ *The Euro and Economic Policy. Legal and Political Texts adopted by the Council of the European Union and the European Council.* General Secretariat of the Council of the European Union, January 1999, pp. 129-133.

On the other hand, extra-fiscal objectives mean using the fiscal policy instruments (such as the tax system, programmes of budget expenditures) for regulating the behaviour of enterprises and households, equalizing the levels of people's wealth, social objectives accomplishment and economic development between regions, regulating economic cycles and changing allocation of resources of factors of production across the country.¹⁴

Fiscal policy can also be discussed in the narrower sense as the policy of regulating economic cycles (among others, Keynesian approach). In this case the primary issue is using such instruments as taxes and state expenditures (including automatic stabilizers of economic cycles, that is programmes of expenditures and progressive tax systems with built-in flexibility in relation to changes in GDP) in order to stabilize economy and stimulate economic growth.¹⁵ And this narrow concept of fiscal policy will be considered in our further discussion.

Fiscal policy must be efficient to be a good instrument of regulating economic processes. Unfortunately there are a number of limitations to its efficiency. First of all, it is poor flexibility of this policy for information-related, political and social reasons which include:¹⁶

- the government does not have enough information concerning the course of economic growth (information-related limitations)
- difficulty in achieving a parliamentary consensus concerning changes in the size of the budget deficit and budget structure (operational limitation),
- a long period of preparing and discussing tax changes (time limitations),
- social barriers in raising taxes or limiting budget expenditures,
- specificity of government expenditures – it is easier to raise them but more difficult to reduce them,
- political cycle being in contradiction to rational fiscal policy.

All these reasons may cause that the government's inability to respond to asymmetric shocks in the specified time. Delayed fiscal actions can be inadequate to the economic situation in which they are undertaken.

What is more, stabilization effects of fiscal policy are at least dubious, especially in the long run. Even if the increase in fiscal expenditures causes GDP growth in a short period, the long-term effect of budget deficit and public debt will level off this benefit resulting from fiscal intervention. It is worth noting that it will happen in a twofold way. Firstly, interest rates will increase and secondly, the crowding-out effect will occur.¹⁷

¹⁴ See: S. Bukowski, *op. cit.*, pp. 47-48.

¹⁵ Ibidem.

¹⁶ See also: Mortimer-Lee P., *op. cit.*; S. Bukowski, *Teoretyczne podstawy ...*, *op. cit.*, pp. 61-62.

¹⁷ See more on his topic: U. Kosterna, *op. cit.*, pp. 84-147.

Table 1: Short-, medium- and long-term effects and functioning of fiscal policy, tax reduction, budget deficit and public debt

Type of mechanism	Functioning of the mechanism	Short-term effects	Medium- and long-term effects
Fiscal policy	Equalizing demand	Relaxation of unemployment by stimulating production and employment, increasing budget deficit and public debt	<ol style="list-style-type: none"> 1. Maintaining high budget deficit and public debt 2. Increase in tax burden and decrease in economic growth and welfare 3. Increased interest rates 4. Crowding-out effect
Reduction of taxes (incl. direct taxes) and simplification of the tax system	Stimulating economic activities, capital accumulation, economic growth and employment	Temporary drop in budget revenues, increased budget deficit	<ol style="list-style-type: none"> 1. Increased savings and capital accumulation 2. Increased investments and employment 3. Accelerated economic growth and increased GDP growth 4. Increased competitiveness of enterprises and economy 5. Increased budget incomes 6. Reduced grey economy
Lowering budget deficit and public debt by reducing expenditures	Reducing the crowding-out effect, stimulating economic growth in the long-run, creating possibilities of introducing reforms and reducing taxes	Temporary drop in the rate of economic growth	<ol style="list-style-type: none"> 1. Increased stabilization of economy 2. Increased tendency for work due to reduced social protection 3. Reduced interest rates 4. Increased private investments due to limited crowding-out effect

Source: author's own development

Functioning and short-, medium and long-term effects of fiscal policy, reduced taxes, budget deficit and public debt are presented in Table 1.

From the point of view of Keynesian economics limiting possibilities of increasing the budget deficit share in GDP above the adopted reference value is essential from the point of view of efficient stabilization of economy by means of fiscal policy.

However, one question must be answered: have the European Union countries applied fiscal policy for economic cycle stabilization according to the Keynesian rules or not?

Keynesian economics has eroded for many years (and definitely in the 1970s and 1980s). The changes in the budget deficit level were not only a pre-meditated action to stimulate growth or cool down economy but to a large extent it resulted from difficulties with limiting expenditures on political consumption and transfer expenditures.¹⁸ The increase in the latter was related to political promises and broadening of social privileges (to some extent, the increased social expenditures are the result of the deteriorating demographic situation of Western European societies), growing share of the so-called “rigid” expenditures (expenditures created by social or economic privileges granted to specific branches and sectors of economy, regions and confirmed by the law in force). Hence, the problems with growing structural deficits emerged (i.e. independent from cyclical fluctuations in economy), which “got out of control” and became a serious destabilizing factor and a barrier to economic growth in West European countries.¹⁹

P.R. Krugman²⁰ criticizes the opinion based on Keynesian economics according to which the fiscal policy created at the supranational level is indispensable in the monetary union countries to stabilize economy. According to him in the 1980s and 1990s majority of countries gradually departed from treating fiscal policy as an instrument of demand stimulation. It is also like this in the United States. Thus, there is no reason to attach too much importance to the role of fiscal policy as an instrument of stabilizing economic situation. This function can be successfully performed by monetary policy and the market. Besides, it emphasizes a negative influence of public debt on economy in the long-run.

The problem of the effect of the price stability criterion on economic growth can be summarized in the following question: must economic growth be accompanied by high inflation and does the policy of maintaining low inflation pose a barrier to economic growth?

As A. Wojtyna puts it: “Economists agree that moderate inflation is better than high inflation and low inflation is better than moderate. Moreover, theoretical arguments against inflation are much more convincing than conclusions from empirical studies. Although the latter seem to confirm it more and more that low inflation is beneficial for economic growth, the level on which its adverse effects start clearly to grow is still a matter of dispute.”²¹

High inflation has an adverse effect on processes of economic growth (lower rate of economic growth, the gap between a potential and actual rate of economic growth) in the long-run, which consists, among others of the following consequences mentioned in literature:

- Negative effect of “inflation tax” on real income and savings, uncertainty concerning price changes and reduced investment rates in GDP (decline in

¹⁸ This is confirmed by investigation results of among others, U. Kosterna, see: U. Kosterna, Deficyt budżetowy państwa i jego skutki ekonomiczne, CASE, Wydawnictwo Naukowe PWN, Warszawa, pp. 34-83.

¹⁹ See more on the topic: W.H. Buster, „Crowding Out” and Effectiveness of Fiscal Policy, “Journal of Public Economics”, June 1977; B.D. Bernheim, *A Neoclassical Perspective on Budget Deficits*, “Journal of Economic Perspectives” Vol. 3, No 2 (Spring), 1991; A. Wojtyna, *Nowoczesne państwo kapitalistyczne a gospodarka. Teoria i praktyka*, Wydawnictwo Naukowe PWN, Warszawa 1990, pp. 164-195. Kosterna, op. cit., pp. 131-140, 188-189.

²⁰ See: Krugman P.R., *Currencies and Crises*, The MIT Press Cambridge, London, 1999, pp. 201-202.

²¹ A. Wojtyna, *Szkice o polityce pieniężnej*, PWE, Warszawa 2004, p. 41.

the share of investments in fixed assets in GDP and substitution between investments in fixed assets and short-term financial investments),

- Disturbances in financial markets (increased speculation),
- Decline in labour productivity

Consequently, the above mentioned factors lead to the low rate of economic growth in the long run.

Results of majority of empirical studies point to a negative influence of inflation on economic growth in the long run. And thus, R. Barro showed that the relationship between inflation and economic growth is of non-linear nature and that inflation has an adverse effect on the rate of economic growth in the long run.²² R. Barro investigated relationships between inflation and economic growth basing on statistical data from 100 countries for the period 1960-1990. The results of his studies reveal that at the inflation rate growth of 10 p.p., the real GDP growth drops by 0.2-0.3 p.p. annually, and the investment to GDP ratio by 0.4-0.6 p.p.(percentage points). The increase of average annual inflation by 10 percentage points causes that in 30 years' time the real GDP level is lower by 4-7%.²³

A negative influence of inflation on economic growth is pointed to by results of empirical studies of such authors as: J. Andres and I. Hernando, A. Gosh and S. Philips, and S. Fisher.²⁴

Results of empirical studies concerning the relationship between inflation and economic growth in OECD countries carried out by J. Andres and I. Fernando reveal harmful influence of inflation on economic growth and non-linear relationship between inflation and economic growth. They showed also that the inflation rate reduced by 1 percentage point could increase production by 0.5- 2.5%.²⁵

A. Gosh and S. Philips carried out investigations based on 30,603 annual observations concerning the real GDP growth per capita and average annual inflation concerning 145 countries in the period 1960-1996. The results of their studies reveal that there is a positive correlation between low interest rates (2-3%) and the rate of economic growth. These authors indicate that the inflation rate of 2.5% is the threshold overstepping of which always causes negative correlation between inflation rate and the rate of economic growth..²⁶

S. Fisher based his studies on a dozen or so macroeconomic variables, including consumer price index (CPI) in 93 countries. He showed that inflation affects economic growth reducing investments and productivity growth rate.²⁷

²² See: R.J. Barro, *Inflation and Economic Growth*, NBER Working Paper 5326, 1995; R.J. Barro, *Determinants of Economic Growth – A Cross-Country Empirical Study*, The MIT Press, Massachusetts Institute of Technology 1997.

²³ Ibidem.

²⁴ See: M. Sarel, *Non-Linear Effects of Inflation on Economic Growth*, IMF Working Paper No WP/95/56, 1995; J. Andres, I. Hernando, *Does Inflation Harm Economic Growth? Evidence for the OECD*, Banco Espana Working Paper 9706, 1997; A. Gosh, S. Philips, *Warning: Inflation May Be Harmful to Your Growth*, IMF Staff Papers Vol. 45, No 4, 1998; S. Fisher, *The Role of Macroeconomic Factors in Growth*, NBER Working Paper No 4565, 1993.

²⁵ J. Andres, I. Hernando, op. cit.

²⁶ A. Gosh, S. Philips, op.cit.

²⁷ S. Fisher, op. cit.

The quoted research results indicate that a low inflation rate fosters economic growth in the long run. However, there are no reasons to claim that maintaining inflation at the low level (1-2.5%) is a factor holding up economic growth.

Sustainable high unemployment rate is unlikely to be a result of low inflation rate. If we treat the inflation rate as a parameter, then a high unemployment rate in the long-run is a result of other factors including, among others: labour market overregulation and rigid wages, low mobility of labour force (geographically and vocationally), excessive fiscalism, extensively developed social policy, etc.

Fiscal stabilization and price stability are prerequisites of relative stability of long-term interest rates but also short- and medium term interest rates and their relatively low level. It seems that irrespective of the above mentioned premises which stood behind introducing the criterion of a long-term interest rate, its implementation fosters the long-run macroeconomic stability and economic growth.

As far as the exchange rate criterion is concerned, it refers to the countries joining the Economic and Monetary Union . There is a relationship between the exchange rate stability within the ERM-II and the remaining convergence criteria and in particular the conditions of fiscal stabilization.

It is a criterion which should be implemented when the economy of the country which wants to join the Union is relatively stable and the criteria of price stability, fiscal stabilization and long-term interest rate are relatively well fulfilled. This “relative fulfillment” of the criteria should result from essential structural and institutional changes in economy.

Stabilization of the exchange rate of a given country within the framework of ERM-II in the course of 2 years means that despite the lack of currency-related restrictions the exchange rate undergoes minimal fluctuations around the central exchange rate. This proves a possibility of joining a single currency area. Replacing such currency with single currency is only a confirmation of the naturally existing state of affairs.

It must be emphasized that the exchange rates of the EU member countries function within the framework of a single financial market and consequently at a high mobility of capital on the international scale. This entails serious consequences for economic policy. As the analysis of the Fleming-Mundell model indicates, at a high mobility of capital and in the situation of stable exchange rate, fiscal policy – unlike monetary policy -has a positive effect on GDP growth. In this case, expansive monetary policy leads to a big outflow of currency reserves.

Price stability (low inflation) and stable exchange rates are a particularly important factor determining success of an undertaking being the rigidity of exchange rate in relation to the Euro. In order to ensure exchange rate stability, the country’s monetary authorities should aim at keeping national inflation fluctuations within a narrow range with reference to foreign inflation and a narrow margin of interest rate fluctuations around the parity of interest rates. Otherwise , if the interest rate deflects significantly from the average in the European Monetary Union, a strong pressure on currency depreciation can occur. This, in turn, may lead to the escape of foreign capital,

unbalanced balance of payments and loss of currency reserves. On the other hand, a significant upwards deflection of interest rates from the parity will attract short-term speculative capital thus acting towards currency appreciation. Convergence of exchange rate to the range extremes set by the permitted fluctuation margin is dangerous and promotes speculative attacks. Besides, it requires costly currency-related interventions.

The level of prices in the economy of a country of a relatively low economic development which is planning to join the European Monetary Union is determined, among others, by two basic factors. They are: Samuelson-Balassa²⁸ effect and pro-inflation influence of budget deficit. These factors affect also the increase in interest rates.

The pro-inflation effect of the Samuelson-Balassa effect is revealed first of all by economies which based their economic growth on liberalization of their foreign trade (among others, the case of new EU members). In the economies of this type productivity grows in the sector of exchangeable goods thus leading to higher wages. Due to imitation (here by pressure from the Trade Unions) the growth in wages is transferred to the sector of non-exchangeable goods where the rate of growth starts to exceed the growth in labour productivity. As a result, internal demand grows and consequently, prices rise. In the long run productivity growth leads also to the national currency appreciation.

Budget deficit and public debt which result from it influence the price level as well as the level of interest rates. Increased budget deficit stimulates inflation expectations. Moreover, the open market operations accomplished in order to stabilize the exchange rate can influence the increase in the monetary base when the central bank buys bonds and treasury bonds in order to counteract excessive currency appreciation.

Budget deficit and public debt affect the growth of interest rates. This, in turn, affects the growth of pressure on currency appreciation pushing the exchange rate towards the lowest border of the permitted fluctuation margin. It is worth mentioning that public debt is related to the issue of securities which are an attractive investment instrument for banks. By means of the portfolio crowding-out effect it leads to the maintenance of high interest rates on bank credits and a large spread between the interest rate on credits and the interest rate on bank deposits. Nevertheless, the interest rates on deposits and interest rates on securities are usually above the interest rates abroad. High interest rates in the country in relation to the foreign interest rates and attractiveness of securities for foreign investors attract mainly short-term capital

Budget deficit is usually accompanied by the deficit in current account. Maintaining high budget deficit and a deficit in current account are negative signals for foreign investors and it is quite likely that they will withdraw their capital from a given country. This increases the risk of a currency crisis.

²⁸ See: B. Balassa, *The Purchasing Power Parity Doctrine: A Reappraisal*, „Journal of Political Economy”, Vol 72, 1964; P. Samuelson, *Theoretical Notes on Trade Problems*, “Review of Economics and Statistics”, Vol 46, 1964.

Therefore, it is crucial for the country joining the ERM-II to have a stable situation in the sphere of public finance. The ERM-II accession must be preceded by a deep reform of public finances aiming at suppressing the growth in budget deficit and public debt, and then bringing budget deficit and public debt to a low level measured by their share in the GDP. Taking into account the convergence criteria, they should be met prior to entering the ERM-II. Otherwise, the exchange rate will fluctuate dangerously and the risk of failure for the whole undertaking will grow. It must be emphasized that it is not the nominal convergence criteria which must be satisfied. Meeting the nominal convergence criteria must result from the real convergence processes. The reform and restructuring of the economy of the country which plans the ERM-II accession should rely, among others, on deregulating moves. It means creating the conditions for flexible functioning of markets, including labour market. Because in the situation of a rigid exchange rate (rigid in relation to the Euro) and large mobility of capital the possibilities of employing the economic policy are more limited than in the situation of liquid exchange rates (or even stable ones but with a possibility of devaluation and re-valuation), then the main burden of adjustment in a two-year period of stabilization and later, when the national currency has been replaced by the Euro, will rely on the mechanism of flexible markets. It is of particular importance in the case of economic shocks of demand- or supply-side nature which may occur in the period of stabilizing the exchange rate.

An important issue is also the level of the national currency exchange rate at the moment of making it rigid in relation to the Euro with reference to the long-term balance of the balance of payments. If the exchange rate of the national currency is overvalued in relation to the Euro, this means that the balance in the current account is deteriorating, export competitiveness is reduced and reserves flow out of the country. The lower competitiveness of exports and negative balance in the current account may be maintained for a longer period of time and entail recession in the economy. The example of the former German Democratic Republic is worth remembering here where within the framework of the Union with the German Federal Republic the basic conversion rate of East German mark into West German one was at the level of 1:1. This meant the East German mark was appreciated in relation to the West German mark by ca. 450%. This move resulted in the slump in exports from former German Democratic Republic, bankruptcy of numerous enterprises and long-term recession.²⁹

Conclusions

Convergence criteria are, to some extent, a consequence of adopting theories of optimum currency areas and cost and benefit analysis of creating a single-currency area as the foundation of the monetary union of the European Community.

Fulfillment of convergence criteria should be of durable character and this requires a certain degree of real convergence among the monetary union countries.

The analysis of the significance of convergence criteria which has been carried out in this paper indicates that despite numerous extra-economic premises for adopting them in the Maastricht Treaty, their implementation is an important factor enforcing

²⁹ See: S. Bukowski, op. cit., p. 73.

macroeconomic stabilization in the EMU countries and the countries which aspire to the EMU accession.

From the point of view of the theory of economics as well as from the point of view of empirical studies it cannot be declared unambiguously that the convergence criteria pose a barrier to economic growth. This matter is controversial, yet it may be concluded that implementation of these criteria by the EMU member countries and the countries which are waiting for joining the Union is an important factor of the long-run macroeconomic stabilization and balanced economic growth in the EU. Naturally, are other factors apart from this one.

Low economic growth rate and relatively high unemployment in the EU countries result, first of all, from such factors as: overregulating of economies (including labour market), rigid wages and prices, excessively developed social policy, high taxation burden for population and enterprises, too big budgets which should be reduced while reducing taxes and expenditures at the same time. Therefore, economic reforms aiming at creating institutional and structural conditions for efficient functioning of market mechanisms are indispensable. These reforms should aim at increased flexibility of markets, prices and wages, lower taxation and reduced role of the state in economy.

Bibliography:

- Balassa B., *The Purchasing Power Parity Doctrine: A Reappraisal*, „Journal of Political Economy”, Vol. 72, 1964.
- Barro R.J., *Determinants of Economic Growth – A Cross-Country Empirical Study*, The MIT Press, Massachusetts Institute of Technology 1997.
- Barro R.J., *Inflation and Economic Growth*, NBER Working Paper 5326, 1995.
- Buiter W.H., “Crowding Out” and Effectiveness of Fiscal Policy, “ Journal of Public Economics, June 1977.
- Buiter W.H., *Macroeconomic Policy During a Transition to Monetary Union*, Centre for Economic Policy research, No 1222 August, 1995.
- Bukowski S., *Teoretyczne podstawy i realizacji unii monetarnej krajów członkowskich Wspólnot Europejskich. Szanse i zagrożenia dla Polski*, Wydawnictwo Politechniki Radomskiej, Radom 2003.
- De Grauwe P., *Unia walutowa*, PWE, Warszawa 2003.
- Economic Studies, No 20, 2005, Deutsche Bundesbank.
- Frankel J.A., Rose A.K. , The Endogeneity of the Optimum Currency Area Criteria , CEPR, Discussion Paper Series, No 1473, 1997.
- Gabrisch H., *Financial Fragility and Exchange Rate Arrangements of EU Candidate Countries*, International Center for Economic Growth. European Center, Working papers Nr 15, Macroeconomic Studies, November 2002.
- Gosh A., Philips S., *Warning: Inflation may be Harmful to your Growth*, IMF Staff Papers Vol. 45, No4, 1998. Fischer S., The Role of Macroeconomic Factors in Growth, NBER Working Paper No 4565, 1993.
- Grubel H.G., *International Economics*, Homewood, Illinois 1977.
- Grubel H.G., *The Theory of Optimum Currency Areas*, „Canadian Journal of Economics”, May 1970.
- Kenen P.B.[1970], *The Theory of Optimum Currency Areaa: An Eclectic View*, (in:) R.A. Mundell, A.K. Svoboda (red.), *Monetary Problems of the International Economy*, Chicago

University, Chicago 1970.

Kosterna U., Deficyt budżetu państwa I jego skutki ekonomiczne, CASE, Wydawnictwo Naukowe PWN, Warszawa 1995.

Krugman P.R., *Currencies and Crises*, The MIT Press, Cambridge, Massachusetts, London, England, 1999.

Krugman P.R., Obstfeld M., *International Economics. Theory and Policy*, Addison-Wesley Publishing Company, Massachusetts 2000.

Magnifico G., *European Monetary Unification for balanced Growth: New Approach*, Princeton University Press, Princeton 1971.

McKinnon R.I., *Optimum Currency Areas*, ‘The American Economic Review’ Vol. 53, September 1963.

Mortimer –Lee P., *Czy Euroland może funkcjonować przy jednej stopie procentowej?*, (w:) P. Temperton (red.), *Euro. Wspólna waluta*, Feldberg SJA, Warszawa 2001.

Mundel R.A., *A Theory of Optimum Currency Areas*, ‘The American Economic Review’, Vol. 53, September 1961.

Oreziak L., *Euro. Nowy pieniądz*, Wydawnictwo Naukowe PWN, Warszawa 2003, ss. 35-41.

Orłowski W., *Optymalna ścieżka do euro*, Wydawnictwo Naukowe Scholar, Warszawa 2004.

Samuelson P., *Theoretical Notes on Trade Problems*, ‘Review of economics and Statistics’ Vol. 46, 1964.

Sarel M., *Non-Linear Effects of Inflation on Economic Growth*, IMF Working Paper No WP/95/56, 1995; J. Andres, I. Hernando, Does Inflation Harm Economic Growth? Evidence for the OECD, Banco Espana Working paper 9706, 1997.

Tavlas C.G.SD., *The “New” Theory of Optimum Currency Areas*, ‘The World Economy’, Vol. 16, No 6, November 1993.

The Euro and Economic Policy. Legal and Political Texts adopted by the Council of the European Union and the European Council. General Secretariat of The Council of The European Union January 1999.

The Euro: explanatory notes by Directorate General II – Economic and Financial Affairs, Euro Papers, Number 17, February 1998.

Treaty on European Union – Final Act, 1992, europa.eu.int/abc/obj./treaties/en.entocol.html.

Wojtyna A., *Szkice o polityce pieniężnej*, PWE, Warszawa 2004.

Wojtyna A., *Nowoczesne państwo kapitalistyczne a gospodarka. Teoria i praktyka*, Wydawnictwo Naukowe PWN, Warszawa 1990.

Wood G.E., *European Monetary Union and the U.K. – A Cost –Benefit Analysis*, ‘Surrey Paper in Economics’ No 3, University of Surrey, Guildford, September 1973.

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