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EFFECTS OF INTERNATIONAL MONETARY INTEGRATION ON INFLATION, ECONOMIC GROWTH AND CURRENT ACCOUNT

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Abstract: *There are various benefits which countries could derive from renouncement of a national currency hallmarked by unstable external and internal value. The most evident one is reduction of a long-term inflation rate. The objective of this paper is to test the hypothesis of the positive influence which monetary integration exerts on monetary stability and economic growth. On the other hand, monetary integration can also cause certain economic problems to countries' economies, such as the one of balance-of-payments adjustment. Hence this paper surveys its influence on current account balance of national economies. The hypotheses are tested empirically by examining the sample of 42 countries from different regions and of different development levels. The results suggest that the monetary integration influences the inflation reduction in developing countries, but not the achieved economic growth rates. At the same time, the results indicate that monetary integration contributes to increase in current account deficit of developing countries, but not of developed ones.*

Key words: *international monetary integration, economic growth, inflation, current account.*

INTRODUCTION

Reducing the number of national currencies, as one of the features of world economy, can be interpreted as logical consequence of growing integration of international commodity and financial market. In terms of a fierce currency competition, a number of weak national currencies was suppressed by world's major currencies. Simultaneously to this so-called dollarization process, growing integration of economies of the European Union led to establishment of a monetary union and to creation of regional currency – euro. The practice of renunciation of national currency is presently most common in Europe, among former and current transition countries, either outside or within the European Union.

The distinction between creation of monetary union and dollarization can be observed from many different aspects. However, what they have in common is loss of national monetary sovereignty and thus inability to conduct national monetary policy and national exchange rate policy.

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Achieving economic and productivity growth are final goals which economic policy aims for, so that the benefits from monetary integration can also be seen as monetary integration's contribution to accomplishing these goals.

Monetary integration can directly be condusive to increasing the competition and investment. The benefits which monetary integration brings arise from macroeconomic stabilisation and ellimination of foreign exchange risk between members of monetary integration. Through the effects of monetary integration, macroeconomic stabillisation affects reduction of inflation rate, reduction of real interest rate and strengthening of the budgetary discipline. The ellimination of currency risk and therefore currency conversion fees and simpler price comparison lead to increased international trade and investments within the single currency area.

The above mentioned does not close the list of possible positive effects of monetary integration on national economy. It can be expanded through support to the development of financial sector, as well as through the advantage of the international use of monetary union's common currency which is realised only if the particular currency takes a significant place on the global financial market.
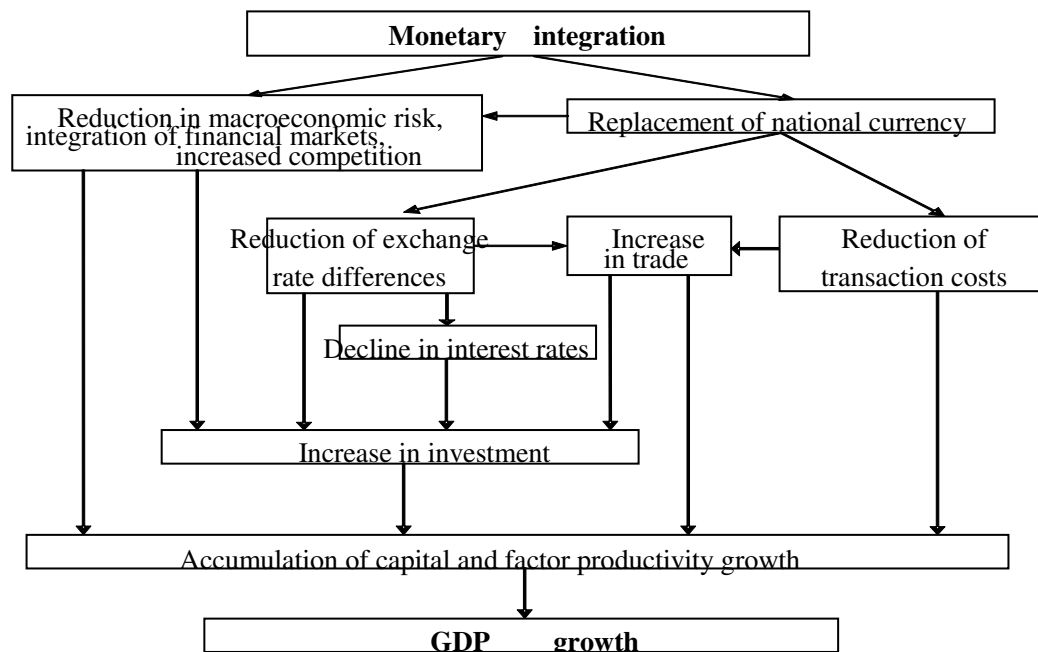
Besides all the benefits, replacement of the national currency with foreign or regional money brings to the particular country certain costs as well. First of all, the country loses an important mechanism of adaptation in case of balance of payments disturbancies within the currency area – a possibility to change the exchange rate (Mundell, 1961). Through renouncing the national currency, the possibility to conduct an independent monetary policy also goes astray as there is a risk that the common monetary policy (in the event of monetary union) or foreign monetary policy (in the event of dollarization) will not suit the interests of the respective country in that particular moment. Both potential problems could have effect upon the increase in inflation or causing barriers to economic growth.

The ultimate effect of monetary integration on inflation and economic growth depends on extent of opposition between positive and negative influences. The objective of this paper consists in empirical confirmation of the basic research hypothesis:

1. Monetary integration leads to reduction of a long-term inflation rate;

2. Monetary integration leads to increasing a long-term economic growth rate;

3. Monetary integration leads to increase in current account deficit.

The paper consists of three sections, followed by the conclusion. The first section comprises the review of main conclusions of previous researches which deal with the same set of issues. The subsequent section includes the description of applied research methods, as well as data which will be used within the research. The section which presents the project results is devided into three subsections due to the subject of the research resp. the fact that the paper surveys the impact of monetary integration on three macroeconomic variables: economic growth, inflation rate and balance-of-payments current account. The main results and limitations of the study are presented in the Conclusion.

REVIEW OF PREVIOUS RESEARCH

Accepting the foreign or regional currency represents an extreme form of exchange rate fixing within the given group of countries. Therefore, the question of macroeconomic effects of monetary integration is related (but not equal) to the question of fixed exchange rate effects.

In order to draw a comparison between different exchange rate regimes due to their impact on inflation and economic growth, it is in a first place necessary to properly classify the countries according to the exchange rate regime they are applying.

Namely, one country's monetary policy is often opposite to the official exchange rate regime. For instance, many developing countries which, after facing the currency crises in 1990s, moved to the floating exchange rate still conduct the monetary policy which often pursues a goal of long-term exchange rate stabilisation. In the literature, such attitude of monetary authorities, which is not completely consistent with officially accepted floating exchange rate regime, is called «Fear of Floating» (Bayoumi & Eichengreen, 1994). On the other hand, despite the official application of the floating exchange rate regime, in some developing countries the external value of currency is persistently going down which is a consequence of frequent devaluations. Nevertheless, changes in exchange rate can be minor also in the event of applying the fully floating rate of exchange as is often the case with developed economies during the expansion of world economy. All this indicates the gap which could be found between the offcial (*de jure*) and the real (*de facto*) exchange rate regime.

The above mentioned inconsistencies between the official exchange rate regime and the actual monetary policy make every research of economic performances based on *de jure* regimes unreliable. Therefore, contemporary literature contains many attempts to provide classification of countries according to the regime they conduct, based on observations of exchange rate movements over a longer period (Ghosh et al., 1995; Levy-Yeyati & Sturzenegger, 2003; Rogoff et al., 2004). Since 1990 the IMF also publishes, within its reports, the classification of countries according to *de facto* exchange rate regime, placing them into one of following eight categories: regimes without specific national currency, currency board arrangements, conventional (adjustable) fixed arrangements, target zones, crawling pegs, crawling bands, managed floating exchange rate and freely floating exchange rate.

Frequently used in research projects are classifications of several authors which are a result of observing the long time series of exchange rate behaviour of a large number of currencies, such as following studies: Ghosh, et al. (1995, 1998), Rogoff, et al (2004) or Levy –Yeyati, & Sturzenegger (2005).

The first group of authors made a comparison between official regimes of 147 countries with exchange rate movements of their currencies over a period of several decades. Only those countries whose exchange rate behaviour is in accordance with the official regime entered the classification of so-called *«consensus pattern»* where the countries are sorted out due to classification of all regimes into three groups: fixed, floating and intermediate exchange rate.

Unlike this classification, Rogoff, et al (2002) put the countiries into one of five categories of so-called *«natural scheme»*: fixed, limited flexibility, managed floating, freely floating and freely falling exchange rate behaviour (the last one includes countries in which the annual inflation rate exceeds 40%).

The number of countries according to *De Facto* Exchange Rate Regime within the official IMF's classification (*De Facto Classification of Exchange Rate Regimes and Monetary Policy Framework*) is shown in Table 1.

Table 1: Number of countries according to *De Facto* Exchange Rate Regime applied in 2009

Exchange rate regime	Number of countries
Without national currency	10
Currency board arrangements	13
Conventional fixed rate	68
Target zones	3
Crawling pegs	8
Crawling bands	2
Managed floating exchange rate	44
Freely floating exchange rate	40*
In total	188

Note: The EMU member states are each separately classified under the group of countries with freely floating exchange rate.

Source: *De Facto Classification of Exchange Rate Regimes and Monetary Policy Framework, IMF, Washington DC, 2010*

Empirical studies almost always confirm the positive effect of a fixed exchange rate (and monetray integration) on monetary stability (IMF, 1997; Edwards, & Magendzo, 2002; Edwards, & Magendzo, 2006; Meller, &Nautz, 2009). IMF's study (1997), conducted on a sample of 145 countries which were sorted out in three groups due to the officialy applied exchange rate (fixed, intermediate and floating exchange rate) and whose economic features were observed during the thirty-year period, indicates the following:

1.   Inflation rate was the lowest in the group of countries with a fixed exchange rate, then in countries with intermediate and finally in those with floating exchange rate.

2.   Countries with fixed exchange rate regime whose currency's parity frequently changed had higher inflation rates than those in which the currency parity less often changed.

3.   The growth of money supply is lower in countries with fixed than in those with floating exchange rate.

The conclusions made are valid regardless of trade openness or of the level of country's development.

Also studies based on previously described «consensus classification» of countries due to *de facto* exchange rate regime have proven significant advantages of a fixed exchange rate in sense of its contribution to the monetary stability. One of those study's results (Ghosh, Gulde, & Wolf, 2002) are shown in Table 2.

Table 2: Inflation under different exchange rate regimes, period 1970–1999

	Average annual inflation	**Median inflation**
De jure classification		
Fixed exchange rate	13,3	8,0
Intermediate regimes	22,0	9,6
Floating exchange rate	24,3	9,0
De facto classification		
Fixed exchange rate	9,4	6,9
Intermediate regimes	30,2	11,4
Floating exchange rate	58,8	21,7

Source: Ghosh, A., Gulde, A., & Wolf, H. (2002). *Exchange Rate Regimes: Choices and Consequences*, Cambridge, USA: MIT Press

The results indicate that within fixed regimes rates of inflation are lower than in case of other exchange rate regimes, no matter which classification is used: either *de jur*e or *de facto*, and regardless of observing either average inflation or the median value.

The advantage of the fixed exchange rate over the floating one in terms of achieving monetary stability has been proven by complex econometric studies as well in which many other variables were controlled which, beside the exchange rate regime, influence the infaltion rate, such as: money supply growth, real GDP, budget balance, trade coefficient etc.

However, the advantage of the fixed exchange rate over alternative regimes is not sustainable in all cases when countries are grouped according to their income level, i.e. development. Using the «natural classification» of countries due to *de facto* exchange rate regime, it is possible to bring to proof that the fixed exchange rate in industrialized countries is linked to three percentage points higher annual inflation than in the countries from the same group which have a floating exchange rate. On the other hand, in the group of developing countries with low *per capita* income fixed exchange rate is related to lower inflation rates while in the group of developing middle-income countries different regimes do not show a statistically significant difference. Such differences in the results can be explained by different circumstances which different income-groups of countries are facing. The main difference consists in volume and stability of foreign capital inflow. Countries at low development level are not very attractive for foreign capital which therefore does not considerably reflect to the overall price level. Monetary stability in medium developed countries may be threatened by significant, but unstable capital inflows. Despite high amounts, international capital flows in developed countries do not have any destabilizing effects, due to the development of their financial markets and stability of flows. Accordingly, only in the group of countries with medium development level an important relationship between foreign capital inflow and overall price level has been identified.

The relation between applied exchange rate regime and economic growth is less clear and more difficult to prove than the one between exchange rate regime and inflation. Various empirical research projects have not managed to disambiguate the question of relation between monetary integration and economic growth (Bayoumi, & Eichengreen, 1994; Ghosh, et al., 1998; Edwards, 2001; Edwards, & Magendzo, 2001; Levy-Yeyati, & Sturzenegger, 2002; Rogoff, et al., 2004). The reason for that is probably the fact that the effects of monetary integration are difficult to isolate from many other effects that influence the growth of economy. The already mentioned study, Ghosh, Gulde & Wolf (2002), came to a conclusion that the highest average annaul growth rate had been achieved by the group of countries with managed flexible exchange rate. Even econometric methods that are more complex than those used within this research have not provided any clearer results. Some studies, as a matter of fact, produced contradictory results. For instance, Rogoff, et al. (2004) claim in their study that developed countries with floating exchange rate achieve higher economic growth rates than those which apply fixed exchange rate while in the group of developing countries there is no statistically noteworthy relationship. As opposed to this, the study conducted by Levy-Yeyati & Sturzenegger (2003) indicates the existance of a significant relationship between exchange rate floating and economic growth precisely in the group of less developed countries as in developed ones this relationship disappears.

RESEARCH METHODS AND DATA

This paper tends to test the effects of monetary integration on inflation and economic growth by comparing the long-term average of mentioned economic indicators in two groups of countries: countries without their own national currency and countries which have their currency and apply a flexible exchange rate. To the first group belong countries which apply dollarization, currency board or monetary union membership. The classification of countries based on applied exchange rate regime has been done according to the data from *De Facto Classification of Exchange Rate Regimes and Monetary Policy Framework* (IMF, 2010). Data on actual inflation and economic growth rates, as well as on current account balance of the observed countries are taken from the publication *World Economic Outlook* (IMF, 2010).

Testing the hypothesis on the influence of monetary integration on raising monetary stability and increasing inflation rate and economic growth rate will be conducted due to comparison of average inflation rate and economic growth rate, in the period 2005-2009, between the group of countries which have their own currency and the group of countries without a national currency, so that the analysis belongs to so-called „*cross sectional*" researches. Statistical significance of a observed difference in average values obtained is being tested through using an appropriate statistical tool – two-sided Student's t-test for unpaired data. Since application of the t-test is justified only in case that the data are sampled from a normal population which follows a normal distribution, this assumption is tested using the method of Kolmogorov and Smirnov. All calculations and statistical tests in this paper is done in *Statistical Package for the Social Sciences – SPSS.*

According to experience acquired on previously mentioned analyses, the sample of countries must be chosen taking into account the differences in their development level, so that this analysis consists of two complementary parts. The first part is devoted to testing the difference in actual inflation rates between developing countries and transition economies while the second part provides the same analysis conducted on a sample of developed countries.

Number of countries which apply dollarization or currency board is 23, against a group of 40 countries with freely floating exchange rate. If observing only developing and transition countries, 21 countries apply dollarization or currency board arrangements and 10 countries have freely floating exchange rates. With an aim of proper sampling and better comparison, very small, mostly island countries with insufficiently diversified economies have been excluded from the group of countries without natonal currencies. The sample of 40 countries includes 18 developing and transition economies and 24 developed countries. Number of countries which have their national currency with freely floating exchange rates is 21 while in the rest of them as legal tender is used foreign or regional currency

(euro) or a currency board is effective. The structure of the sample is given in Table 3.

Table 3: Sample

	Countries with national currency	Countries without national currency
Developed countries	Australia Canada Israel Japan Republic of Korea New Zealand Norway Sweden Switzerland Great Britain USA	Austria Belgium Finland France Germany Greece Ireland Italy Luxembourg Netherlands Portugal Spain Hong Kong*
Developing and transition countries	Albania Brazil Chile Mexico Philippines Poland South Africa Turkey Congo Zambia	Ecuador El Salvador Panama Dominica Bosnia and Herzegovina* Bulgaria* Estonia* Lithuania*

* Hong Kong, Bulgaria, Estonia, Lithuania and Bosnia and Herzegovina have their own currency but they apply the currency board regime.

IMPLICATIONS OF MONETARY INTEGRATION ON SELECTED ECONOMIC INDICATORS

Influence of monetary integration on inflation rate

For the sample of developing and transition countries, the average annual rates of inflation in a four-year period (2005-2009) have been observed. The parameters for the sample are given in Table 4.

Table 4: Parameters for the sample of developing and transition countries

	Freely floating exchange rate	**Currency board and dollarization**
Average value	6,129%	3,373%
Sample size	10	8
Standard deviation	4,001	1,146
Standard error	1,265	0,4052
Minimum value	1,77	1,53
Maximum value	13,43	5,40
Median	4,870	3,335
Lower limit of the confidence interval (95%)	3,267	2,414
Upper limit of the confidence interval (95%)	8,991	4,331

Source: calculation performed using the SPSS software package

According to the data obtained, the mean value of average inflation rates in the group of countries with freely floating exchange rate is 6,13% versus 3,37% in the group of countries which implement dollarization or currency board. Statistical significance of the difference can be tested using the two-sided Student's t-test for unpaired data. The test result (statistics P=0,0448) suggests a statistically significant difference in average inflation rates, thus it can be concluded that monetary integration contributes to monetary stabilisation of developing and transition countries.

When speaking about developed countries, in the period 2005-2009 average inflation rate in countries without national currency was 2,19%, and 1,95% in the group of countries that have freely floating exchange rate. Other parameters are presented in Table 5.

Table 5: Parameters for the sample of developed countries

	Freely floating exchange rate	**Without national currency**
Average value	1,953%	2,189%
Sample size	11	13
Standard deviation	0,9806	0,6979
Standard error	0,2956	0,1936
Minimum value	0.10	0,98
Maximum value	3,15	3,43
Median	2,00	2,18
Lower limit of the confidence interval (95%)	1,294	1,767
Upper limit of the confidence interval (95%)	2,611	2,611

Source: calculation performed using the SPSS software package

The result of the t-test (P=0,4982) suggests that the observed difference in actual inflation rates is not statistically significant. In other words, different exchange rate regimes in two defined groups of developed countries did not have an impact on the difference in inflation rates.

Results obtained through the analysis lead to the conclusion that monetary integration can serve as a means of stabilizing the overall price level in less developed economies, however not to influence the differences in inflation rates among developed countries.

Influence of monetary integration on economic growth

By analogy with the conducted statistical analysis of the influence of monetary interation on inflation, its impact on the average growth rate of real GDP can also

be tested. This time as well, the development level of countries should be taken into account, so that the first part of the analysis includes developing countries and countries in transition, and the second one developed countries. The average growth rate of real GDP observed relates to the period 2005-2009.

Table 6: Parameters for the sample of developing and transition countries

	Freely floating exchange rate	**Dollarization and currency board**
Average value	5,00%	5,50%
Sample size	10	8
Standard deviation	1,099	2,010
Standard error	0,3475	0,7107
Minimum value	3,30	3,13
Maximum value	6,73	9,10
Median	5,315	5,600
Lower limit of the confidence interval (95%)	4,214	3,827
Upper limit of the confidence interval (95%)	5,786	7,188

Source: calculation performed using the SPSS software package

In developing and transition countries which are monetary integrated, the mean value of average inflation rates is slightly higher (5,5%) than in countries with freely floating exchange rates (5%). Statistical significance of the difference was tested based on Welch's correction. The resulting P value (0,5356) indicates a statistically insignificant difference in achieved GDP growth rates which does note prove the clear impact of monetary integration on economic growth in this group of countries.

The second part of analysis is related to the group of developed economies. Parameters for the sample are given in Table 7.

Table 7: Parameters for the sample of developed countries

	Freely floating exchange rate	**Without national currency**
Average value	3,11%	2,97%
Sample size	11	13
Standard deviation	0,8017	1,708
Standard error	0,2417	0,4737
Minimum value	2,23	0,98
Maximum value	4,63	6,85
Median	3,08	2,38
Lower limit of the confidence interval (95%)	2,575	1,942
Upper limit of the confidence interval (95%)	3,652	4,006

Source: calculation performed using the SPSS software package

The difference observed in achieved average growth rates of real GDP on annual level in the four-year period, 3,11% towards 2,97% in favour of countries with freely floating exchange rate, is not statistically significant (P=0,8060), so that neither this time was found a clear link between applied exchange rate regime and economic growth.

Even the impact of monetary integration on economic growth has been proved in none of the observed group of countries, a lack of clear empirical link between monetary integration and growth rate seems to talk more about impossibility of modeling the complex influence of various direct and inderict variables on economic performances rather than about the absence of such link.

Influence of monetary integration on current account balance

The influence of monetary integration on current account will be tested on the same way as in case of two previous parameters, inflation and real GDP growth. Also this time, developing and developed countries will be separately observed in order to remove the influence of different development level and to take into account all the differences which exist between these two groups of countries in terms of foreign trade performances and current transfers of income.

The first part of the analysis is related to developing and transition countries. The current account balance (% GDP) is observed in the period from 2005 until 2009. Parameters for the sample are given in Table 8.

Table 8: Parameters for the sample of developing and transition economies

	Freely floating exchange rate	**Dollarization and currency board**
Average value	-2,57%	-10,40%
Sample size	10	8
Standard deviation	3,506	9,031
Standard error	1,109	3,193
Minimum value	-7,27	-24,13
Maximum value	2,17	2,60
Median	-2,385	-9,420
Lower limit of the confidence interval (95%)	-5,079	-17,956
Upper limit of the confidence interval (95%)	-0,063	-2,854

Source: calculation performed using the SPSS software package

Both groups within developing and developed countries are facing a current account deficit and there is an important difference in their values. In countries which apply dollarization or currency board arrangements an average deficit is 10,4% of GDP while in a group of countries with freely floating exchange rate the deficit is much lower, 2,57% of GDP.

That this difference is a consequence of applied exchange rate regime is confirmed by the t-test's results. Because of unequal variances Welch's correction was performed. The value of P statistics (P=0,0491) indicates that there is a small possibility of observed difference in defficit to be random, i.e. that the observed difference is a result of sampling rather than of real difference between the observed groups.

Study results suggest that the lack of national monetary policy and exchange rate policy in countries which implement dollarization or currency board arrangements influences in a great measure the current state of balance. The reason for this lies

in the fact that monetary policy of the country whose currency is used in countries with dollarization or currency board, often does not correspond to the economic situation in countries which have renounced their national currencies. This is a result of dissimilar economic structures and their inconsistent movements in economic activity on one hand and on the other it is a consequence of poor flexibility and ineffectiveness of other adjustment mechanisms.

When speaking about developed countries, another results can be expected, considering the fact that EMU member states (which comprise the major part of the sample) conduct an active regional monetary policy and along with it are at a similar development level. Economic cycles of these countries, their openness to foreign trade and commodity structure of exports are much more consistent than in the event of developing and transition economies. Nevertheless, despite many limitations, the balance of payments adjustment mechanisms in these countries function much more efficiently.

Parameters for the sample of developed countries from the aspect of the size of the current account deficit are given in Table 9.

Table 9: Parameters for the sample of developed countries

	Freely floating eschange rate	Without national currency
Average value	2,21%	0,85%
Sample size	11	13
Standard deviation	8,213	6,326
Standard error	2,476	1,754
Minimum value	-8,58	-9,00
Maximum value	18,13	9,35
Median	1,93	1,15
Lower limit of the confidence interval (95%)	-3,309	-2,976
Upper limit of the confidence interval (95%)	7,726	4,670

Source: calculation performed using the SPSS software package

The difference noticed in the amount of current account deficit in two observed groups of countries (2,21% vs. 0,85%) is not statistically significant (P=0,6510)

which confirms the initial assumption that in developed countries the difference in deficit is not related to differences in the applied exchange rate regime.

CONCLUSION

The research on effects that the renunciation of national monetary sovereignty has on inflation rate confirms that renouncing the national currency in favour of a strong foreign currency contributes to establishing the monetary stability in developing and transition economies whereas the use of foreign or regional currency within the group of developed countries does not effect the decreasing of inflation rate.

Considering the level of development, the difference noticed in results can be explained by the fact that developing countries in general have unstabile national currencies i.e. long history of high inflation in the period prior to the renunciation of national currency. Moreover, precisely this can be seen as the main reason why some of these countries decided to officialy accept a foreign currency. On the other hand, developed countries which have renounced their monetary sovereignty (first of all Eurozone member states) had, also before introduction of the euro, in most cases relatively low inflation rates (with the exception of Ireland, Italy, Portugal, Greece and Spain), so that the effect of monetary integration is statistically insignificant.

In regard to the effect of monetary integration on economic growth rate, the analysis conducted did not prove its existance either in developed countries or in developing ones. However, this conclusion should be interpreted with caution, having in mind the difficult isolation of some effects in a variety of factors which determine the rate of economic growth.

The study results also indicate that the lack of national exchange rate policy in developing countries, which decided to oficially implement dollarization, affects the current state of balance causing a sharp increase in deficit. This conclusion is not surprising since monetary policy of the most developed countries can not suit the countries at considerably lower level of development with weaker economic and export structures and lower productivity growth rate. It is also often the case that inflation in developing countries which apply dollarization is, although reduced, at a higher level than inflation in the country whose currency is used (Balassa-Samuelson effect), so it comes to a steady loss of price competitiveness on the world market.

Unlike the group of developing countries and countries in transition, the impact of monetary integration on deterioration in the current account balance has not been proven in its member states i.e. in developed countries. The reason is that the Eurozone member states (which make up the largest portion of the sample) pursue

an active common monetary policy, as well as that they are at relatively similar development level, thus economic cycles of these countries, their opennes to foreign trade and commodity structure of exports are much more consistent than this is the matter with developing and transition economies.

Finally, basic limitations of the presented study and avenues for future research on influences of the monetary integration should also be stressed. This is primarily related to the statistical tool applied for testing the hypotheses. Although frequently used in the literature and appropriate for comparative analysis which was performed in this paper, applied methods can not in certain cases clearly identify and isolate the impact of some variables on inflation, current account and, above all, economic growth. Namely, it is about macroeconomic indicators that are affected by an indefinitely large number of variables whose influences intertwine as it is the matter with every social system and this makes every modelling difficult and results unreliable. The goal of future research in this field is to specify more complex econometric models which will «control» the impact of a greater number of independent variables and not just economic development as it was the case in this study.

Also, the conclusions of the conducted analysis make room for future research which would be a scientifically and methodogically valid way to predict the effects of introduction of the euro in Serbia which is in recent years even more discussed topic among experts.

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