"Assessment of financial convergence of Ukraine with the CIS countries and the European Union"

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Assessment of financial convergence of Ukraine with the CIS countries and the European Union

Abstract

The article evaluates the financial convergence criteria of Ukraine with the major countries of the Commonwealth of Independent States: Russia, Kazakhstan and Belarus. It also studies the criteria of financial convergence of Ukraine with its main trading partners in Europe: the Eurozone, Poland, Hungary and the Czech Republic. Using the results of the comparative analysis the conclusion has been made that Ukraine has a bigger financial convergence with the CIS countries.

Keywords: economic integration, financial convergence evaluation criteria, financial convergence of Ukraine with the CIS countries, financial convergence of Ukraine with the EU countries.
JEL Classification: E40, F50.

Introduction

The increased uncertainty on the international commodity and financial markets reduces the potential of economic growth for small open economies, including Ukraine. As a result, the study of the practical aspects of the formation of international economic integration structures at the regional level grows in importance.

Given the geopolitical, economic and historical factors of Ukraine, its entry into the regional economic formations is traditionally viewed in terms of two alternative directions: accession to the European Union (the EU) or integration with the countries of the Commonwealth of Independent States (the CIS). Considering the complexity and multidimensional nature of the problem we try to identify certain solutions based on the comparative analysis of criteria of financial convergence of Ukraine with some of the CIS countries and the European Union.

1. Justification for the selection of countries and the list of criteria for financial convergence assessment

For the study of criteria of Ukraine's financial convergence with the CIS countries and the EU it is necessary to solve two related problems. Firstly, it is important to justify the list of countries to be included into this analysis. Secondly, we have to determine the criteria of financial convergence, which will be investigated.

In our opinion, the first problem can be solved by using the following procedure: at first we determine the list of the CIS countries and countries of the European Union, which are the main trade partners of Ukraine. Then, by using the formal logical analysis this list is narrowed. According to the method of calculation of the real exchange rate [1], the main trade partners of Ukraine are the countries, the share of which in the total foreign trade turnover exceeds 1%.

Among the CIS countries the major trading partners of Ukraine are Russia, Kazakhstan, Belarus and Moldova [2]. According to the analysis of socio-economic development of the CIS countries, we believe it appropriate to exclude Moldova from the list of countries for potential economic integration. Our conclusion is determined by the insignificant volume of this country's internal market, as well as the negative trends in its socio-economic development in the period 1990-2011. Moreover, this country is characterized by significant levels of political instability and possibilities of an armed conflict.

The paper assesses the expediency of Ukraine's economic integration with Russia, Kazakhstan and Belarus. These countries have made some practical steps towards economic and financial integration: (1) Russia, Kazakhstan, Belarus (as well as four other CIS countries) are involved in the implementation of the concept of cooperation and coordination in the currency area [3, 4]; (2) on July 30, 2012 Ukraine ratified a free-trade agreement [5], becoming the third country (along with Russia and Belarus) that implemented this procedure.

Ukraine, Russia, Kazakhstan and Belarus have already been studied by researchers [6, 7] in order to assess the possibilities of economic integration. The creation of the currency union of Russia and Belarus is also discussed.

In determining the list of the EU countries we use the following considerations. In the first place, we believe it important to analyze the economic expediency of Ukraine's integration into the most advanced monetary union in the world – the Eurozone. In doing so, we have investigated the prospects of the monetary integration of Ukraine into the Eurozone as an integral economic and currency group rather than with its individual member-states.

In the second place, we have identified those European countries that are considered the main trade partners of Ukraine (their share in the total foreign trade turnover of Ukraine exceeds 1%). This list in-

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cludes Germany, Italy, France, Spain, the Netherlands, Poland, Hungary, Czech Republic and the United Kingdom [2]. It should be noted that the first five countries are part of the Eurozone. Therefore, separate calculations regarding the prospects of the monetary integration of Ukraine with these countries is not needed.

In the third place, considering the fact that common borders contribute to the successful development of regional monetary integration we have eliminated the United Kingdom from the list of countries that remained after the second stage of selection.

This paper examines the economic expediency of the monetary integration of Ukraine with Poland, Hungary and Czech Republic, and the prospect of Ukraine's joining the Eurozone. It should be noted that although these Eastern European countries are part of the European Union, they are planning the introduction of the euro only in the medium-term perspective. A delay in the introduction of the single European currency in these countries is linked to both the macroeconomic issues of the post-crisis period and the problems of the EU itself. Therefore, we consider it necessary to conduct a separate assessment of Ukraine's economic integration with these countries.

Economic convergence can be assessed in different ways. Recognizing the diversity of forms and types of economic integration, in our study we have tried to create a list of criteria in terms of formation of the currency union as the highest form of economic integration. Methodological approaches to assessing the economic convergence have been summarized in the works of Drobyshevsky [7], Islam [8] and Weimann [9]. Some methods for assessing the expediency of economic integration of the countries were examined in the works [10-18].

On the basis of the general content of the above mentioned works we have determined the criteria of macroeconomic and financial convergence. Macroeconomic convergence criteria include: the size and diversification of the economy, the mobility of production factors, the symmetry of macroeconomic shocks and trade convergence (volume and structure of foreign trade). The criteria of financial convergence include: fiscal integration, inflationary convergence, similarity in interest rates, development levels of the financial sector, monetary convergence and adequacy of gold and foreign exchange reserves.

The research results of macroeconomic convergence criteria are given in a separate study. This paper presents the results of the study of expediency of financial integration of Ukraine with the countries of the CIS and the European Union. For assessing the financial convergence criteria we use the databases of the following international organizations: United Nations Statistics Division [19], International Monetary Fund [20], Interstate Statistical Committee of the Commonwealth of Independent States [21] and the World Bank [22].

2. Assessment criteria of financial convergence of Ukraine with the biggest CIS countries

First, we analyze *fiscal convergence*. To assess this criterion we examine the budget deficit given as a percentage of GDP (Table 1). For the calculation of this table's values we have used the real GDP in U.S. dollars [19]. Budget deficit in U.S. dollars is determined by using the official exchange rate of national currencies to the U.S. dollar during the reporting period [21].

Table 1. Deficit (surplus) of the state budget of Ukraine, Russia, Kazakhstan and Belarus in 2007-2011

Year	Belarus		Kazakhstan		Russia		Ukraine	
	Mln. US dollars	In percentage of GDP	Mln. US dollars	In percentage of GDP	Mln. US dollars	In percentage of GDP	Mln. US dollars	In percentage of GDP
2007	196	0,54%	-1 757	-2,56%	77 814	8,68%	-1 525	-1,53%
2008	862	2,17%	-2 770	-3,91%	81 100	8,59%	-3 913	-3,83%
2009	-342	-0,86%	-3 340	-4,65%	-77 292	-8,88%	4 783	5,49%
2010	-1 411	-3,29%	-3 578	-4,66%	-52 197	-5,77%	-8 149	-8,98%
2011	1 102	-	-3 879	-	28 923	-	-2 898	-
Average		-0,36%		-3,94%		-0,65%		-2,21%

According to the Maastricht criteria, budget deficit should not exceed 3% of GDP. We have used the real (not nominal) GDP. Therefore, the calculated indices might be slightly inflated compared with the official data regarding the relative size of the state budget deficit (surplus). However, the analyzed values of the state budget deficit of Belarus and Kazakhstan almost meet the Maastricht criteria. On the other hand, the size of the budget deficit of Russia and Ukraine was 2-3 times higher than the set deficit limit. The calculated mean values idicate that in 2007-2010 the surveyed countries had a deficit (not surplus) budget that was caused mainly by the consequences of the global financial crisis of 2008.

Further we analyze *the inflationary convergence* of the CIS countries (Table 2). To analyze this criterion we examine two parameters: the difference in standard deviations of logarithms of consumer price index growth rate (further referred to as CPI) and

the correlation of the growth rates of this indicator. It should be noted that according to the IMF database [20], for this analysis we use the CPI growth rate to the previous year, rather than the more common indicator of price dynamics: CPI from December 2002 to December of the previous year.

Table 2. Indicators of inflationary convergence of Ukraine, Russia, Kazakhstan and Belarus in the period of 2002-2011

Country	Difference in standard deviations of logarithms of consumer price index growth rate				Correlation of the CPI growth rates			
	Belarus	Kazakhstan	Russia	Ukraine	Belarus	Kazakhstan	Russia	Ukraine
Belarus	0,000	0,384	0,431	0,219	1	-0,24	0,58	-0,43
Kazakhstan		0,000	0,047	0,604		1	0,01	0,65
Russia			0,000	0,650			1	-0,18
Ukraine				0,000				1

Based on the analysis of the data in Table 2, we can conclude that the economy of Ukraine and Belarus is characterized by significant volatility of price dynamics while the situation in Russia and Kazakhstan is more stable. The analysis of inflation dynamics correlation provides different results: the inflationary tendencies are similar for Belarus and Russia and for Ukraine and Kazakhstan. The indicators of CPI correlation for these groups of countries are statistically significant. Similar approaches were used to study the similarity of interest rates dynamics (Table 3). The object of our analysis are refinancing rates of central banks [20], which are the key indicators of the cost of funds on the national money markets.

Table 3. Indicators of refinancing rates convergence for Ukraine, Russia, Kazakhstan and Belarus in the period of 2002-2011

Country	Difference in standard deviations of logarithms of refinancing rates				Assessment of convergence dynamics		
	Belarus	Kazakhstan	Russia	Ukraine	Standard deviations, (σ_{t-1})	Standard deviations, (σ_t)	$\sigma_{t-1} - \sigma_t$
Belarus	0,000	0,383	0,249	0,384	0,558	0,547	0,011
Kazakhstan		0,000	0,134	0,001	0,165	0,164	0,001
Russia			0,000	0,135	0,345	0,298	0,048
Ukraine				0,000	0,191	0,163	0,028

The results of the analysis make it possible to claim that there are no significant differences in the volatility of refinancing rates between Ukraine, Russia and Kazakhstan (Table 3). On the other hand, the money market of Belarus is characterized by the high volatility of refinancing rates that is 2-3 times higher than the volatility of rates in other countries. We have also assessed the dynamics of convergence on the basis of the comparative analysis of standard deviations in different time intervals. The results of the analysis demonstrate the reduction of refinancing rates volatility during 2011 in these countries.

The analysis of the rates correlation in the period 2001-2011 shows that the only statistically significant relationship is observed between the refinancing rates of Belarus and Russia. The average strength of relationship exists between the rates in Ukraine and Kazakhstan, as well as between the rates in Ukraine and Russia.

We will analyze the currency convergence based on the study of volatility and correlation of national currencies rates to the U.S. dollar [20] (Table 4) and the study of expansion of foreign exchange transactions in the national economies (Table 5).

Table 4. Indicators of convergence of official foreign exchange rates of Ukraine, Russia, Kazakhstan and Belarus in the period of 2002-2011

Country	Difference in standard deviations of logarithms of the growth rates of national currencies to the U.S. dollar				Correlation of the growth rates of national currencies to the U.S. dollar			
	Belarus	Kazakhstan	Russia	Ukraine	Belarus	Kazakhstan	Russia	Ukraine
Belarus	0,000	0,086	0,073	0,043	1	0,39	0,34	0,14
Kazakhstan		0,000	0,013	0,043		1	0,97	0,89
Russia			0,000	0,030			1	0,89
Ukraine				0,000				1

The results of the analysis make it possible to conclude that Belarus has the highest rate volatility. Currency markets in Kazakhstan and Russia are characterized by low volatility of rates. These countries and Ukraine have a high mutual correlation of the national currency exchange rate to the U.S. dollar during the period from 2002 to 2011. Therefore, only the dynamics of the Belarusian ruble is not linked to the

dynamics of the national currencies of potential currency union partners. In our opinion, this aspect can be explained by the strict government influence on the exchange rate in this country, as well as the currency crisis which took place in Belarus in 2011.

Table 5 presents data to assess the expansion of foreign currency transactions in the financial system of these countries. This assessment was based on the analysis of the ratio of non-resident liabilities of

banks and M3 aggregate. These figures have been obtained from the IMF database [20].

The value of the indicator in these countries fluctuates within 18-45% of the broad money. However, its dynamics varies. We can make a conclusion about the similarities in the expansion of currency operations in the majority of the surveyed countries. The only exception is Belarus, where the significance of financial resources of non-resident is growing.

Table 5. Indicators of dependence of banks' resource base on non-residents in Ukraine, Russia, Kazakhstan and Belarus in the period of 2001-2011

Indicators	2001	2007	2008	2009	2010	2011	Average for 2001-2011	Growth rate 2011/2001, %
Belarus, billion rubles								
Ratio of non-resident liabilities of banks to M3 aggregate, %	11	22	22	27	34	45	21	395
Kazakhstan, million tenge								
Ratio of non-resident liabilities of banks to M3 aggregate, %	-	118	74	55	31	23	70	40*
Russia, billion rubles								
Ratio of non-resident liabilities of banks to M3 aggregate, %	18	29	31	21	19	18	22	101
Ukraine, million hryvnias								
Ratio of non-resident liabilities of banks to M3 aggregate, %	8	36	55	47	33	28	25	368

Notes: * Given the lack of data on Kazakhstan the growth rate is calculated for the period from 2003 to 2011.

Another conception for assessing the convergence criteria on the basis of standard deviations includes the research of "sigma convergence". We will complete the analysis of rates and inflation rates by assessing their sigma convergence (Figure 1). To assess

the currency sigma convergence we have calculated standard deviations of logarithms of the growth rates of national currencies to the U.S. dollar for 2001-2011. Similar approach was used to assess the sigma convergence of consumer inflation and refinancing rates.
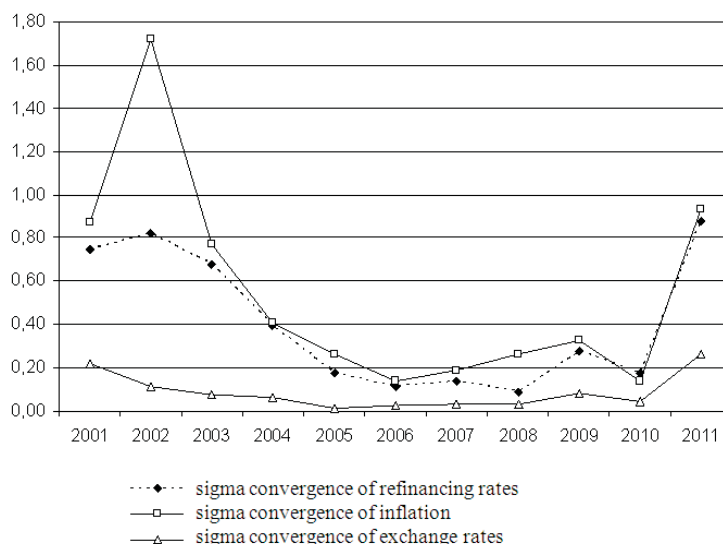

Fig. 1. Assessment of sigma convergence of refinancing rates, inflation and exchange rates of Ukraine, Russia, Kazakhstan and Belarus in the period of 2001-2011

The results of the analysis make it possible to conclude that sigma convergence of the researched indicators was growing (the absolute value of the group standard deviations was decreasing in time) in the period of 2001-2006. In 2008-2009, the decrease of

sigma convergence as a result of the global financial crisis was observed. In 2010 the value of this indicator improved, but the results of the year 2011 showed its dramatic deterioration caused by the imbalance of indicators of the financial sector of Belarus on the

background of the acceptable volatility of rates in other countries. Further, based on the World Bank data [22], we will conduct a comparative analysis of indica-tors of *the financial sector development* (Table 6). To provide an opportunity to compare the results, all figures are presented as a percentage of GDP.

Table 6. Indicators of the financial sector development of Ukraine, Russia, Kazakhstan and Belarus in the period of 2007-2011

Indicator	2007	2008	2009	2010	2011	Average	In relation to the corresponding indicators for Ukraine
Belarus							
Requirements to the sectors of the national economy (with the exception of government)	33	38	51	60	58	48	0,68
Internal credits provided by the banking sector	27	33	34	45	34	35	0,45
GDP monetization	25	24	28	31	41	30	0,55
Kazakhstan							
Requirements to the sectors of the national economy (with the exception of government)	62	53	55	45	41	51	0,72
Internal credits provided by the banking sector	41	54	55	45	41	47	0,61
GDP monetization	36	39	44	39	36	39	0,72
Russia							
Requirements to the sectors of the national economy (with the exception of government)	40	43	47	46	48	45	0,63
Internal credits provided by the banking sector	24	24	34	38	40	32	0,42
GDP monetization	43	39	49	53	53	47	0,88
Ukraine							
Requirements to the sectors of the national economy (with the exception of government)	62	80	81	69	62	71	
Internal credits provided by the banking sector	61	82	89	79	73	77	
GDP monetization	55	54	53	55	52	54	

Having analyzed the relative size of the banking assets (with the exception of government loans) and bank loans to residents, we can conclude that in comparison with other countries the banking system of Ukraine plays the biggest role in the structure of the national economy. Russia and Belarus are cha-racterized by almost the same relative size of the banking system, which is 1.5-2 times smaller than the Ukrainian one. The relative size of assets in the banking system of Kazakhstan is somewhat higher than in Russia and Belarus, but significantly lower than in Ukraine.

We have also studied the monetization of GDP, which is defined as the ratio of M2 to GDP. The average level of monetization for 2007-2011 in the surveyed countries ranged within 30-54%. According to the results of the year 2011 the Ukrainian and the Russian economies were the most mone-tized, whereas in the economies of Kazakhstan and Belarus this figure was significantly lower. The

analysis of the relative degree of monetization of GDP confirms the above made conclusions.

The monographic study of T. Savchenko [23, p. 235-239] shows that for the Ukrainian economy an equilibrium value of the monetization level is around 50-55%. In our opinion, this value can be used as a benchmark for other CIS countries, which are analyzed in this paper. For countries with developed market economies the equilibrium level of monetization is significantly higher. Thus, the monetization of the economies of Ukraine and Russia is close to the optimal value whereas the economies of Kazakhstan and Belarus are not suf-ficiently monetized and characterized by signifi-cant volatility of this indicator.

The analysis of the banking system should be com-plemented with the study of performance figures of the national stock markets, which are calculated according to the World Bank data [22] (Figure 2).

Fig. 2. Indicators of development of the stock markets in Ukraine, Russia and Kazakhstan in 2007-2011, % of GDP

This figure does not include similar indicators for Belarus due to the lack of the relevant data. Based on the analysis of the market capitalization of companies listed on these countries' domestic markets the following conclusions can be made. First, the Russian stock market is the biggest according to its relative size: the capitalization of companies with securities listed on the market in the post-crisis period ranged from 43 to 70%. The stock market of Ukraine is the least developed. Second, the results of the analysis of the relative value of securities traded on these markets, confirm the conclusion about the relatively high level of the stock market development in Russia. On the other hand, the stock markets of Kazakhstan and Ukraine are not involved in the active securities trading.

The last criterion involves the analysis of *the adequacy of gold and foreign exchange reserves* (Figure 3). The calculations were carried out on the basis of the World Bank data [22].
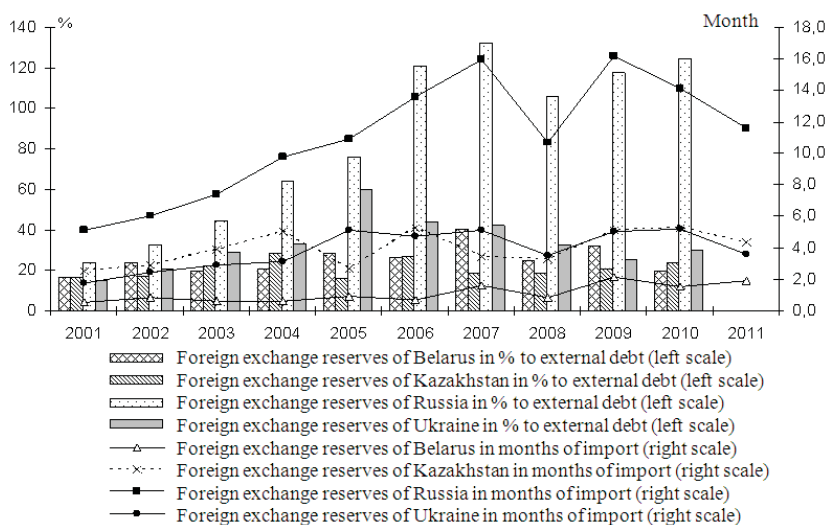

Fig. 3. Relative indicators of the adequacy of gold and foreign exchange reserves of Ukraine, Russia, Kazakhstan and Belarus in the period of 2001-2011

To perform this task we have researched two relative ratios: foreign exchange reserves in percentage to external debt (left scale) and foreign exchange reserves in months of import (right scale). According to the results of their analysis, we can conclude that Russia possesses the highest gold and foreign exchange reserves. The reserves of Kazakhstan and Ukraine are sufficient, but their relative value is not much higher than the minimum set by the IMF. The reserves of Belarus are insufficient and they remained below the recommended values throughout the analysis period.

3. Assessment of financial convergence of Ukraine with its main trading partners in the European Union

The level of *fiscal integration* is estimated on the basis of the ratios of budget deficit to GDP and public debt to GDP (Table 7). The calculations were carried out on the basis of the World Bank data [22].

Table 7. Indicators of fiscal integration of Ukraine and the EU countries, in percentage to nominal GDP
in the of period 2006-2010, %

Year	Eurozone		Poland		Hungary		Ukraine		Czech Republic	
	Budget deficit/GDP	Public debt/GDP	Budget deficit/GDP	Public debt/GDP	Budget deficit/GDP	Public debt/GDP	Budget deficit/GDP	Public debt/GDP	Budget deficit/GDP	Public debt/GDP
2006	-1,16	54,82	-3,41	n.a.	-8,59	70,46	-1,03	14,60	-4,06	23,71
2007	-0,72	52,00	-1,88	n.a.	-4,96	70,84	-0,89	12,30	-1,51	24,19
2008	-1,59	60,98	-3,70	n.a.	-3,75	74,29	-1,47	20,00	-1,43	25,48
2009	-5,22	64,70	-6,11	n.a.	-4,10	83,31	-5,61	34,80	-5,96	31,03
2010	-4,99	74,10	-6,73	n.a.	-3,47	82,56	-6,52	39,50	-4,76	35,14
Average	-2,74	61,32	-4,36	x	-4,97	76,30	-3,10	24,24	-3,55	27,91

Note: n.a. – not available.

As mentioned earlier, according to the Maastricht criteria budget deficit should not exceed 3% of GDP and public debt - 60% of GDP. As a result of the global financial crisis of 2008 budget expenditures have grown significantly, which led to a sharp increase in the budget deficit. In addition, there was a dramatic increase in the public debt. As a result, no country with a desire for regional monetary integration, met the Maastricht fiscal criteria by the end of 2010.

The assessment of *inflationary convergence* is conducted by analyzing the correlation, volatility and "sigma convergence" of consumer price indices.

Table 8 presents the results of calculations conducted based on the World Bank data [22] regarding the annual growth rate of consumer prices during the period of 2000-2011. Moreover, the coefficients of the linear Pearson correlation for the logarithm of the growth rate of consumer price index in Ukraine and the corresponding figures in other countries are calculated.

Table 8. Difference of standard deviations and correlation of logarithms for the growth rate of consumer prices in Ukraine and the EU countries in the period of 2000-2011

Country	Difference of standard deviations					Correlation coefficient
	Eurozone	Poland	Hungary	Ukraine	Czech Republic	
Eurozone	0,000	0,135	0,537	0,230	0,607	0,027
Poland		0,000	0,402	0,365	0,741	0,361
Hungary			0,000	0,767	1,143	0,288
Ukraine				0,000	0,376	1,000
Czech Republic					0,000	-0,013

We can make a conclusion about the low synchronization of the inflation dynamics in Ukraine and other countries, as well as a high volatility in consumer prices. These trends suggest a lack of structural homogeneity of the economies of Ukraine and other countries, which can exacerbate the impact of asymmetric shocks in the case of monetary integration. This makes it necessary to conduct an independent currency and monetary policy, which reduces the economic expediency of regional currency integration.

As can be seen from Figure 4, the study of "sigma convergence" of the price dynamics confirms the above conclusions. Accelerated growth rates of consumer prices in Ukraine in 2002-2008 years had an impact on the growth of variance of the consumer price index. However, it should be noted that according to the criterion of "sigma convergence", there has been a gradual synchronization of price dynamics in Ukraine and other countries since 2008.
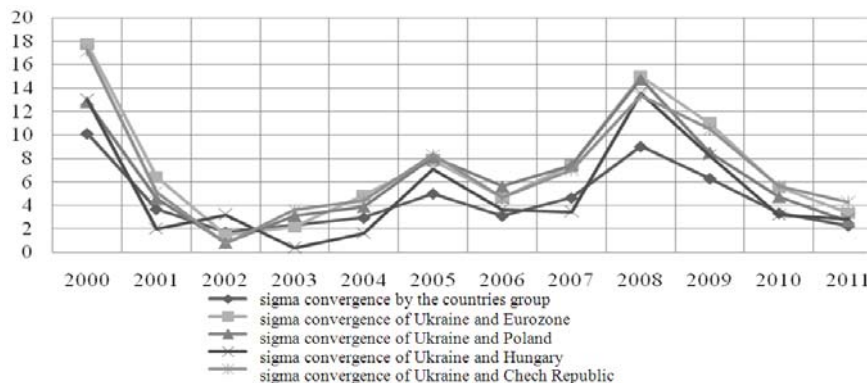

Fig. 4. Dynamics of standard deviation of the consumer price index for Ukraine and the EU countrie
in the period of 2000-2011, %

Based on the analysis of correlation and volatility we will analyze the *similarity of interest rates dynamics* in the surveyed countries. As an object of the analysis we have taken the rate of refinancing of central banks [20], which are the key indicators of the cost of funds on the national money markets.

Table 9 presents the results of calculations of the volatility and correlation values that are based on the data of the International Monetary Fund regarding the average monthly values of refinancing rates in the period from January 2000 to December 2011.

Table 9. Indicators of volatility and correlation of the average monthly refinancing rates for Ukraine and the EU countries in the period of 2000-2011

Country	Mean, %	Standard deviation, %	Variation coefficient, %	Correlation coefficient				
				Eurozone	Poland	Hungary	Ukraine	Czech Republic
Eurozone	3,60	1,27	35,20	1,00	**0,64**	**0,47**	**0,49**	**0,88**
Poland	7,02	4,66	66,32		1,00	**0,64**	**0,88**	**0,87**
Hungary	8,48	2,14	25,21			1,00	**0,53**	**0,66**
Ukraine	11,62	6,81	58,60				1,00	**0,74**
Czech Republic	2,65	1,43	53,73					1,00

Note: In bold there are statistically significant results at the level 0.05.

We can make a conclusion about the existence of close correlation of refinancing rates dynamics in these countries which, on the one hand, creates additional conditions for further economic integration. However, on the other hand, the average refinancing rate in Ukraine during the study period remained very high relative to other countries and amounted to 11.62%, which is 3.2 times higher than the same index of the Eurozone. Moreover, the refinancing rate in Ukraine was characterized by a significant degree of volatility – the correlation coefficient stood at 58.6%. These trends can be interpreted as evidence of the low degree of economic convergence between Ukraine and the European countries.

We will analyze *monetary convergence* on the basis of our research of volatility and correlation of average monthly rates of the Ukrainian hryvnia (UAH),

the euro (EUR), Polish zloty (PLN), Czech koruna (CZK) and Hungarian forint (HUF) to the U.S. dollar (USD) in the period from January 2000 to December 2011 [20].

As shown in Table 10, the highest volatility was typical for the Czech koruna. The variation of its exchange rate to the U.S. dollar reached 29.48%. The variation coefficient of other currencies was comparatively equal (about 18%). It should be noted that in the period of 2000-2011 the exchange rate dynamics of these currencies was characterized by strong mutual correlation.

However, the exchange rate dynamics of hryvnia, unlike other currencies, was characterized by negative correlation. Statistically significant correlation was not found only between the rates of the Ukrainian hryvnia and the Hungarian forint to the U.S. dollar.

Table 10. Indicators of volatility and correlation of the exchange rates of the Ukrainian hryvnia and the EU countries to the U.S. dollar in the period of 2000-2011

Exchange rate	Mean	Standard deviation	Variation coefficient, %	Correlation coefficient				
				USD/EUR	USD/CZK	USD/HUF	USD/PLN	USD/UAH
USD/EUR	0,85	0,15	18,19	1,00	**0,97**	**0,96**	**0,90**	**-0,36**
USD/CZK	25,26	7,45	29,48		1,00	**0,92**	**0,92**	**-0,44**
USD/HUF	219,22	37,72	17,21			1,00	**0,89**	-0,16
USD/PLN	3,39	0,61	18,02				1,00	**-0,25**
USD/UAH	5,91	1,18	19,92					1,00

Note: In bold there are statistically significant results at the level 0.05.

The success of regional monetary integration depends on the reduction of dollarization of the economies. The assessment of the expansion of foreign currency transactions in the financial sys-

tems of the corresponding countries was based on the analysis of the ratio of banks' non-resident liabilities to M3 aggregate on the basis of the IMF data [20] (Figure 5).
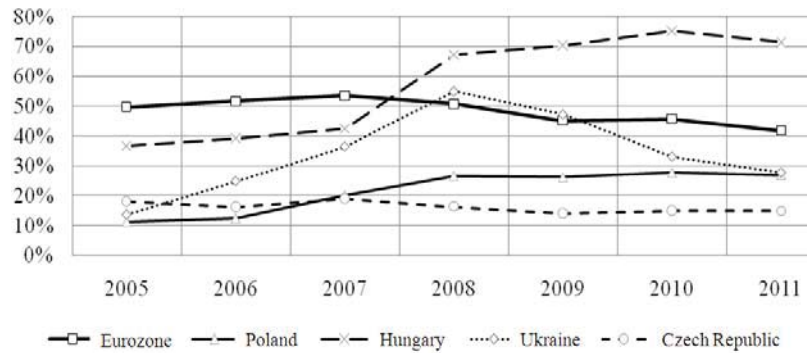
Fig. 5. Dynamics of the ratio of banks' non-resident liabilities to M3 aggregate for Ukraine and the EU countries in the period of 2005-2011, %

The dynamics of this indicator for Ukraine tended to increase in 2005-2008, reaching 55% by the end of the period. However, as a result of the financial crisis the ability of banks to attract funds from external sources was significantly reduced, leading to a gradual decline (28%) in the ratio of banks' non-resident liabilities to M3 aggregate, which corresponds to the value of this indicator for Poland. It should be noted that in most countries the dynamics of this indicator has decreased in recent years. The only exception is Hungary, where this indicator was increasing throughout the study period and reached 71% in 2011.

It is important to emphasize that the U.S. dollar dominates in the structure of external liabilities of Ukrainian banks, which, in our opinion, may create additional difficulties in the regional monetary integration with the surveyed countries. The availability of *developed financial markets and banking systems* is an important prerequisite for successful monetary integration. We will carry out the calculation of indicators characterizing these criteria on the basis of the World Bank data [22].

As seen in Figure 6, the Eurozone has the most developed banking sector: the average amount of loans

directed by banks to the economy in the period of 2000-2011 amounted to 133.67% of the GDP. In the pre-crisis period, the banking system of Ukraine was dynamically developing: the average annual growth rate of the analyzed indicator was 16.73%.

However, the global financial crisis made a significant impact on the banking sector of Ukraine: while the banking systems of other countries continued their gradual development, the volume of loans in the banking sector in Ukraine in relation to GDP was reduced by 9 percent during the 2009-2011 and amounted to 73% of GDP.

These conclusions are supported by the study of the dynamics of non-performing loans in proportion to the total bank loans in the period of 2000-2011. This figure has traditionally been the highest in Ukraine: it varied in the range from 3% to 30% and by the end of 2011 reached 15.4%, which was almost 3 times higher than in the Eurozone. This indicates a significant vulnerability of the banking system of Ukraine to financial shocks, which adversely affects its ability to act as a kind of anti-crisis buffer in the case of monetary integration.
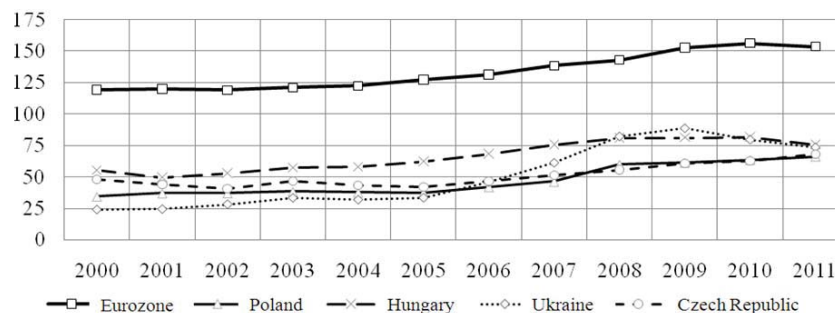

Fig. 6. Domestic credits provided by the banking sector of Ukraine and the EU countries in the period of 2000-2011, as percentage of GDP of the corresponding country

Based on the analysis of the stock markets we can make a conclusion that the Eurozone has the biggest stock market. The average value of shares traded on the stock markets in the euro area in 2005-2011 amounted to 74.19% of GDP. As seen in Figure 7, in 2007 this indicator reached 123.09% of GDP, but the global financial crisis adversely affected the function-

ing of the Eurozone stock market. Similar trends were observed in other surveyed countries. It should be emphasized that the stock market of Ukraine is the least developed: its relative volume is 50 times smaller than the volume of the Eurozone stock market, 17 times smaller than in Hungary, 13 times than in the Czech Republic and 11 times than in Poland.
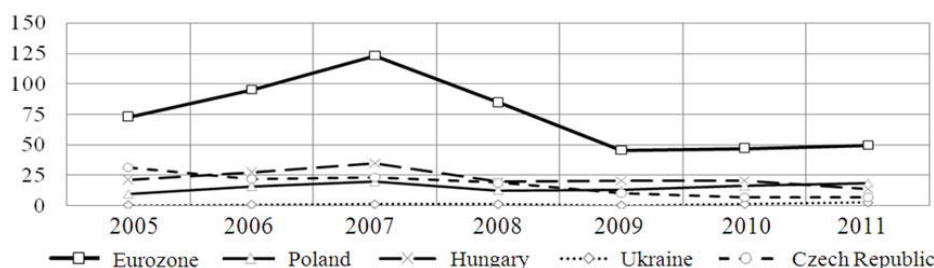
Fig. 7. The value of stocks traded on the stock markets of the EU countries and Ukraine in the period of 2005-2011, as percentage of GDP of the corresponding country

The evidence of the relative underdevelopment of the financial sector of Ukraine is also the lowest level of monetization of the economy in comparison with other EU countries (Figure 8). In 2000-2011 the relative level of monetization of the Ukrainian economy constituted 28% of the level of monetization in the Eurozone and fluctuated within 65-88% of the level of monetization in Eastern European countries.
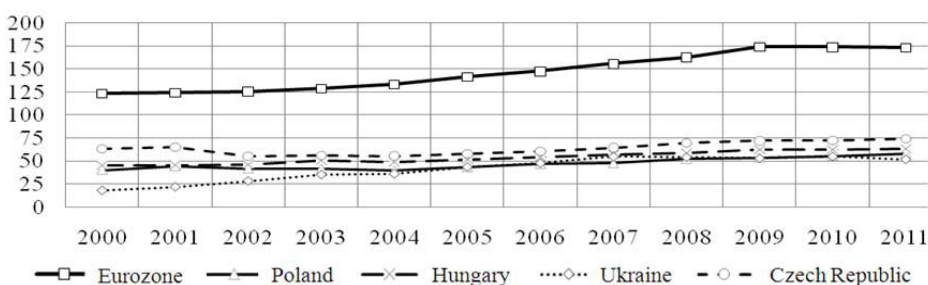

Fig. 8. The ratio of money and quasi-money (M2) to GDP of the EU countries and Ukraine in the period of 2000-2011, %

As seen in Figure 9, since 2004 the *amount of gold and foreign exchange reserves* in Ukraine exceeds the minimal level set by the IMF [22]. In the recent years, the size of gold and foreign exchange reserves has been gradually decreasing as a result of significant pressures on the currency market of Ukraine.
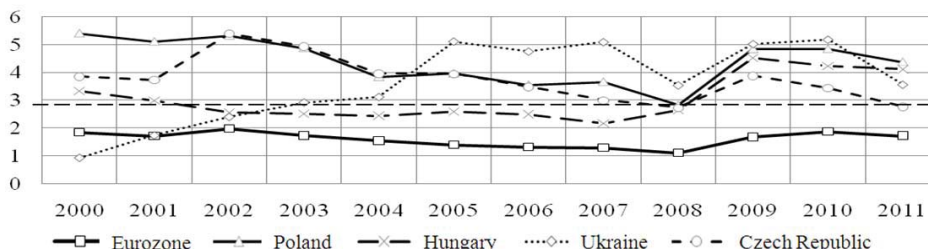

Fig. 9. The dynamics of gold and foreign exchange reserves of the EU countries and Ukraine in the period of 2000-2011, months of import coverage

It should be noted that during the analyzed period the size of gold and foreign exchange reserves in the euro area was never sufficient for 2 months import coverage. This situation is explained by the fact that the role of gold and foreign exchange reserves as an instrument for the regulation of the financial and currency markets in the developed countries is gradually declining.

Conclusions

We have assessed the indicators of financial convergence of Ukraine with some countries of the Commonwealth of Independent States (CIS) and the European Union. The results of the data analysis of the criteria for Ukraine, Russia, Kazakhstan and Belarus are presented in Table 11.

We can make a conclusion that the best situation is observed in the financial sectors of Russia and Kazakhstan. On the other hand, the dynamics of certain financial parameters of Belarus and Ukraine can significantly reduce the potential economic benefits of integration.

Despite some differences in the analyzed financial criteria, the majority of indicators reflect the existence of sufficient financial preconditions for economic integration. The only exception is the financial performance of Belarus: among the eight financial criteria two were negative, two positive and three demonstrate only partial convergence (the data is missing for the calculation of one indicator). Therefore, we are uncertain about the overall compliance of Belarus with the criteria of financial convergence.

Table 11. Assessment of the criteria of financial convergence of Ukraine, Russia, Kazakhstan and Belarus

N	Criterion	Russia	Ukraine	Kazakhstan	Belarus
1	Level of fiscal integration	+/-	+/-	+	+
2	Inflationary convergence	+	-	+	+
3	Similarity of interest rates	+	+	+	+/-
4	Adequacy of gold and foreign exchange reserves	+	+/-	+/-	-
5	Level of development of the banking sector	+/-	+	+/-	+/-
6	Level of stock market development	+	-	+/-	0
7	Relative degree of GDP monetization	+	+	+/-	+/-
8	Volatility of nominal exchange rate	+	+	+	-
9	Level of external borrowings	+	+	+	+/-
	Positive assessment of financial criteria	*8*	*6*	*7*	*4*
	Proportion of positive assessment of financial criteria, %	*89*	*67*	*78*	*44*

Note: Sign "+" is full convergence, sign "+ / -" is partial convergence, sign "-" is absence of convergence.

The paper gives the assessment of the indicators of financial convergence of Ukraine with Eastern European countries (Poland, Hungary and Czech Republic). It also studies the prospects of Ukraine's accession to the Eurozone. The results of the analysis are presented in Table 12.

The results of the assessment suggest that the most desirable would be the monetary integration of Ukraine with the Eurozone, to a lesser extent with Poland. In our opinion, the monetary integration of Ukraine with Hungary and Czech Republic would have negative consequences.

The paper analyzes the costs and benefits of the monetary integration of Ukraine with the Eurozone and Eastern European countries in terms of achieving Ukraine's economic goals. In our view, for the analyzed EU countries, economic integration with Ukraine would bring more losses than benefits.

Table 12. Assessment of the criteria of financial convergence of Ukraine, Poland, Hungary, Czech Republic and countries of the Eurozone

N	Criterion	Eurozone	Poland	Hungary	Czech Republic	Ukraine
1	Level of fiscal integration	+/-	-	-	+/-	+/-
2	Inflationary convergence	+/-	-	-	-	-
3	Similarity of interest rates	+/-	-	+/-	-	-
4	Volatility of nominal exchange rate	+	+	+	+/-	+/-
5	Level of development of the banking sector	+	+/-	-	+	-
6	Level of stock market development	+	+/-	-	-	-
7	Relative degree of GDP monetization	+	+/-	+/-	+	+/-
8	Adequacy of gold and foreign exchange reserves	-	+/-	+/-	-	+/-
9	Level of external borrowings	+	+	+/-	+/-	+/-
	Positive assessment of financial criteria	*6,5*	*4,5*	*3*	*3,5*	*2,5*
	Proportion of positive assessment of financial criteria, %	*72*	*50*	*33*	*39*	*28*

Note: Sign "+" is full convergence, sign "+ / -" is partial convergence, sign "-" is absence of convergence.

The results of the comparative analysis of financial convergence of Ukraine with countries of the Commonwealth of Independent States and the European Union in the context of the criteria analyzed in this paper are presented in Figure 10. It is important to underline that the dynamics of the most important indicators of the financial convergence of Ukraine (similarity of interest rates, inflationary convergence, and fiscal integration) remains higher for the CIS countries than for countries of the European Union.

There are other fundamental issues related to the future of Ukraine's accession to the euro area: the formation of a single monetary and exchange rate policy. The financial systems of Central and Eastern European countries (including Ukraine) are much less developed than the financial systems of other Eurozone countries while their economies are less stable.

Moreover, countries of the Eurozone and the CIS have different mechanisms of sending signals of the monetary policy to the real sector of the economy. If the Eurozone countries use channels associated with interest rates, the CIS countries have a so-called credit channel (due to the significant predominance of bank lending, rather than financing through capital markets). This difference further complicates the financial integration of Ukraine with the Eurozone countries.
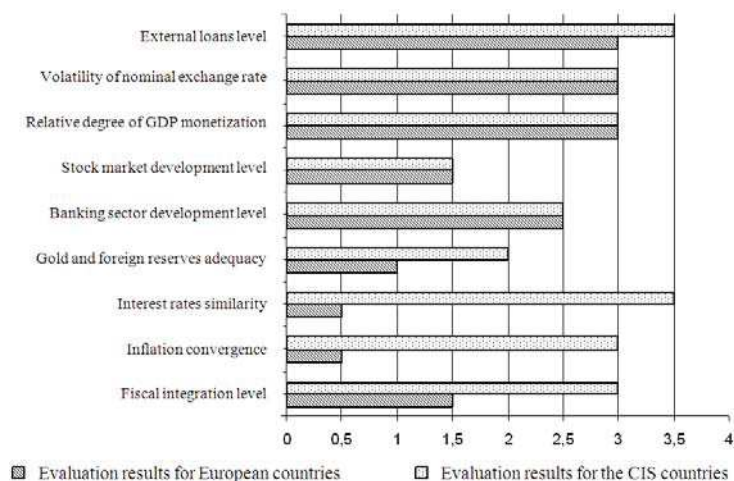
Fig. 10. Comparative analysis of financial convergence of Ukraine with CIS countries and the European Union countries

For the moment it seems more expedient for Ukraine (in terms of financial convergence) to intensify its economic integration with the biggest CIS countries. However, our findings are based solely on the assessment of the financial component in the creation of integrated interstate formations. In this paper, we have not analyzed the macroeconomic criteria of integration as well as political and socio-cultural dimensions of this process. A careful consideration of all the essential aspects is crucial for making an informed decision regarding the ways of Ukraine's economic integration.

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