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REGIONAL COOPERATION OF THE POST-SOVIET COUNTRIES – CAN IT BE INFLUENCED BY THE STRUCTURE OF THE ECONOMY?

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Abstract

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In recent decades, economic development has largely been influenced by globalisation of the world economy. Regional cooperation represents a certain alternative for the ongoing globalisation and concerns establishment of geographically larger markets. Through regional integration, countries are better able to react to changes in the external environment and therefore a larger market scale enables better marketing opportunities.
The conclusion of this research is the fact that despite significant differences between, for example, GDP per capita or the economic growth, there is still similarity in the business cycle or even GDP creation when private consumption and stockbuilding play the key role. In addition, most of the countries mentioned have a negative contribution of export to their GDP, which is closely related to the structure of export itself and its dependency on primary products.

Keywords: Post-Soviet countries, GDP creation, regional cooperation, private consumption, stockbuilding

INTRODUCTION

Currently, more than a half (approximately 55 %) of the world trade takes place within regional business agreements. Regional integration is a frequently discussed topic in the world economy. Economic integration represents a process which includes elimination of obstacles that prevent mutual trade between two or more countries. Therefore it enables, for example, free movement of commodities, capital, labour or employees. Regional or economic integration is a certain compromise between a nation state and global or universal integration. On the other hand, regional and global integration should be viewed as a complementary process (Coulibaly, 2008). Economic integration can be defined as eradication of economic barriers between two or more countries. It concerns tariff and non-tariff measures which hinder free trade. The first theory of mutual regional cooperation was defined by Balassa in the 1960s (Balassa, 1963).

Regarding regional cooperation, it is vital to distinguish between regionalism and regionalization (Breslin and Higgot, 2003). Regionalism refers to state-directed cooperative projects which are the result of intergovernmental dialogue and agreements within a region. Regionalization refers to integration processes which will emerge from the market effect, private trade and investment flows and from politics and decisions made by the society rather than from the predetermined plans of national or local

governments. This concerns a process of economic cooperation and integration which is supposed to lead to economic growth through liberalization of trade and investments (Hurrell, 1995; Nesadurai, 2002; Pangestu and Gooptu, 2003). Regionalization arises from below, whereas regionalism is directed from above. Regionalization is also often marked as market-driven integration. The difference between the two types of integration is also based on the formality of the structure.

The term regionalism represents activities that are planned from above, from the central governmental level (Pangestu and Gooptu, 2004). Regionalism thus does not represent an alternative approach to organization of the country. It concerns a functional system which is connected with certain trade relations. Breslin, Higgot and Rosamont mention the main factors which enable formation of regionalism. The first is a change in the role of the state in the process of government, followed by formalization of civil societies and formation of regional integration schemes (Breslin, et al., 2002)

With regard to regionalization, we can thus refer to a rather bottom-up effect, whereas regionalism concerns a top-down approach.

The main difference between regionalism and regionalization consists in the degree of formal institutionalization. While regionalization is a rather informal process, where for example local entities, non-governmental organizations, and other factors play the decisive role, regionalism is a formal process.

Utilization of comparative advantages of all participating countries forms the basis for successful regional cooperation (Fathipour and Ghahremanlou, 2014), which will enable them to present themselves at a global level as a part of the whole, and this way defend their mutual interests. At the same time, functional regional integration encourages inflow of capital and improves productivity (Kumar, 2015). On the other hand, Myrdal (1957) states that free market does not automatically lead to the decrease of regional disparities, but more often it causes exactly the opposite. Barro-a Sala-iMartin emphasize the fact that the real convergence of the regions often cannot be predicted and that this depends on the models used (Barro and Sala-I-Martin, 2004). It is also necessary to mention that if there is a difference in the infrastructure between the countries, this may lead to regional divergence rather than convergence (Coulibaly, 2006). -convergence that measures the speed of the convergence process is a frequently used indicator for testing the disparity between countries (Leonardi, 2005; James and Campbell Jr., 2013; Viegas and Antunes, 2013). – convergence measures the variance of the GDP per capita over time. However, these indicators will not be used even though it might be assumed that the existence of two very strong economies (Russia and Kazakhstan) may have a spill-over effect on the rest of the countries.

Specifics of regional integration in Eurasia

Integration in the Eurasian area is connected with disintegration of the bipolar world and dissolution of the Union of Soviet Socialist Republics (USSR). Pourchot and Stivachtis (2014) point out that after the end of Cold War, integration tendencies were marked by a significant number of continuous changes which also affected the former USSR territory. After the dissolution of the Soviet Union, the original union republics gained independence and the first integration tendencies started appearing. The Baltic States (which had never demonstrated a strong connection with Russia) signed association agreements with the European Union. The remaining countries created the Commonwealth of Independent States (CIS). This form of cooperation has been a target for many economists and politicians since the beginning of independence of these states (Hartwell, 2013), predominantly in Russia and Central Asia (Azizian and Bainazarova, 2012).

The Commonwealth of Independent States was founded in 1991 after the dissolution of the Soviet Union (USSR) with the aim of coordinating economic and foreign policy in the former USSR's territory. The Commonwealth mutually acknowledged the countries' independence, sovereignty and equality. However, this principle has been breached several times, namely for example the conflict over Southern Ossetia between Georgia and Russia, in which Georgia resigned its membership in the CIS in its protest against Russia. Annexation of Crimea from 2014 is another example. The common past as well as the knowledge of the unifying language is a certain advantage for these countries. Thoumi (1989) understands the non-existence of a common language as a restricting element for integration.

The former Soviet Union countries usually face the same problems which need to be solved together through their closer cooperation, namely political, economic and in security. Eurasian integration is a logical outcome of interconnection of economies and interdependence of these countries (Obydnkova, 2011).

The aim of this paper is to present the characteristics of the economy of the post-Soviet countries with regard to their economic cooperation. The analysis identifies the main economic commonalities and differences between the post-Soviet countries that could support or discourage the idea of economic cooperation between them.

In order to achieve the main aim, several partial aims were defined:

- Definition of specific aspects of the economy in the post-Soviet territory
- Identification of basic trends and tendencies regarding GDP creation of individual post-Soviet countries
- Specification of the differences and common features related to transformation of the economy

of the analysed countries with an emphasis on GDP development
- Identification of individual components of GDP which contribute to its creation with respect to their importance.

The authors ask themselves a fundamental question: are there more commonalities or are these countries so different that any future cooperation would be impossible? As there are two theories about possible cooperation between countries, we would like to determine which of them relates to the post-Soviet countries. The first is based on the convergence approach when Dion (2004) states that it is irrelevant if the countries are similar or not, they will converge eventually. The second theory concerns the so called "Hub and Spoke Principle", in which one country is considered the core and the remaining countries are its "satellites" (Dion, 2004). In our case, Russia can be considered as the hub and the remaining countries of the post-Soviet territory are its individual spokes.

MATERIALS AND METHODS

This paper analyses the situation in the following post-Soviet countries: Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova, the Russian Federation, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan (if data are available), Ukraine and Uzbekistan. Estonia, Latvia and Lithuania are not included as these are already members of the European Union.

The selection of the countries is based on an assumption about mutual economic cooperation and dependence of each state, in particular in relation to the Russian Federation, which is a hegemonic power of the examined region and which endeavours to anchor each of the above states to itself through economic and political ties.

The overall assessment of the current and future economic situation of the selected countries is based on a number of key variables related to the GDP composition and its relations over a period of several years since examining one year only could lead to distorted results.

The data is analysed over the period between 2000 and 2014, which is characterised by general growth of prices of mineral resources and subsequent economic stagnation caused by the global economic crisis of 2009–2010, which in contrast brought about the fall in prices of mineral resources. This fact is crucial for the examined countries, because their vast majority depend on mineral resources exports. Another important fact, which the analysis has not particularly reflected upon, however, is the annexation of Crimea and the EU's subsequent sanctions against Russia.

The Gross Domestic Product is analysed in terms of its creation that is private consumption, change in stockbuilding, gross fixed investments, government consumption and balance of external economic relations – net export. The development of the monitored variables is analysed in relation to each of the above mentioned countries, and the effect of individual components involved in GDP creation on the subsequent GDP value is also analysed for each of the analysed countries and for the region as a whole.

In order to achieve the aim of this study, data analysis methods (statistical mathematical methods), synthesis, induction and deduction are used. Each procedure is based on analysing the development of the data at fixed prices in 2014 and their subsequent recalculation at purchasing power parity. Rates of growth in values of each monitored indicator are analysed. Furthermore, variations are analysed in the development of individual variables that affect the creation of GDP at a country level as well as the region as a whole.

Analysis of the development of GDP components from the expenditure perspective – private consumption, government consumption, gross fixed investment, stockbuilding, external balance – net export is conducted. It is calculated as the growth rate of the component weighed by the contribution of this component to the previous year GDP. This can illustrate the relative importance of this part of GDP in the total GDP. It may appear that the final sum would be slightly different as a result of rounding the numbers.

The impact of individual GDP comprising components on the subsequent GDP value is analysed at fixed price rates using share indicators, year-on-year growth rate, base index, correlation and the degree of GDP elasticity to changes in the values of its individual components. In this regard, elasticity is calculated as a functional-type elasticity derived from logarithmic regression of a function including GDP as an endogenous variable on the one hand, and rising resources, household consumption, government spending, gross fixed investments and balance of external economic relations as exogenous variables on the other.

In order to examine the above elements, the World Bank (WDI database) and PASSPORT databases were used. All the analysed data are annual.

The correlation coefficient – a statistical relationship between two variables – is expressed using a correlation matrix which shows the correlation rate of the GDP value development within the monitored countries.

The aim of the selected methodology is not to acquire the regression function itself, the value of which nor the tests are presented in the paper (given its limited length), but primarily to gain an overview on sensitivity of the development of the GDP value to changes of the value of selected variables that highly contribute to GDP creation in the analysed countries.

Individual regression functions, before the elasticity values were deducted from them, are tested using the standard t-test, p-value and D-W test (with a few exceptions; in this regard they show satisfactory values). The power function was

selected as a suitable tool for two reasons. Firstly, it is a simple tool used for all the calculations. Secondly, the power regression function was selected as it allows a direct estimate of the value of coefficients of elasticity. The estimation of the regression function for selected countries was performed on the time series of the variables for the period 2000–2014.

Except for the above mentioned partial models, the complex regression model was also estimated. This model defines the GDP creation in all the examined post-Soviet countries. The subsequent step was to select a particular functional form that would best correspond to the model. The relation is modelled on the panel data relations for all of the above countries and the time period is 2000–2014. Linear and non-linear models were estimated based on the data sets described above. For further analysis, the power function was chosen as the most appropriate according to the result of econometric, statistical and economic verification. The estimation of the model parameters was conducted using the generalized least squares (GLS) method to reduce autocorrelation. The GLS method is similar to the weighted least square method. The GLS is based on model transformation, in which the model is transformed by means of an invertible matrix, while the transformed error vector has different covariance matrix I.

The level of significance is 1 % (or 5 %) for the parameters of all the selected models as well as the complex model. The coefficient of determination approaches 1. This is caused by the structure of the data and the appropriateness of the chosen functional forms for the analysed variables. For more information about the preliminaries, coefficient estimation and verification of the selected model see for example Gujarati 1988 or Gujarati 2011, and the panel data methodology by Arellano (2010) or Baltagi (2009).

Finally, the cluster analysis is applied to find commonalities between the analysed countries. Before the CA itself was calculated, the input data were standardized using the norming Z-function. Each attribute was normalized into its Z-score by deducting the average and by dividing the determinant deviation. Using this transformation, scale differences and attributes often differing in order of magnitude were eliminated (Meloun and Militky, 2004). After the transformation, the data were clustered using hierarchical clustering. This type of clustering is based on hierarchical organization of objects and their clusters. These clusters were visualized using a dendrogram (Hebak, 2005). Ward's method of clustering was used in this study, the principle of which lies in minimizing cluster heterogeneity according to the criterion of minimum growth of the intra-class sum of squared deviations of objects from the cluster centre. In each step, the increase in the sum of squared deviations is calculated for each pair of deviations occurring due to their clustering. Subsequently, the clusters merge, in which the minimum value of the increase corresponds exactly with (Meloun and Militky, 2004).

RESULTS

Structure of the post-Soviet republics' economy

The importance of each sector in terms of its participation in overall performance of the economy in the monitored period has recorded a significant change. The majority of the post-Soviet republics copy a trend evident in the majority of the developed countries, in which the importance of the status of agriculture in the national economy has been declining. During the monitored period, contribution of agriculture to GDP creation declined by 7 percentage points, whereas in 2000 the primary sector contributed at almost 22 % to the total gross value of the economy, in 2013 only at 13 %. On the contrary, contribution of services increased by 10 percentage points.

However, on comparing the contribution of added value of each sector of NE to GDP, a significant difference between the monitored countries can be found. Tajikistan has the highest contribution of agriculture, in 2013 agriculture constituted 27.4 % of its GDP. Armenia with 21.9 % and Uzbekistan with 19.1 % follow. Kyrgyzstan, Moldova, Turkmenistan and Ukraine also reach more than 10 % of added value of agriculture to GDP. Russia (3.99 %), Kazakhstan (4.92 %) and Azerbaijan (5.66 %) are on the opposite end.

Economic comparison of the post-Soviet republics

There are significant differences between the economies of the post-Soviet republics (Tab. I). Azerbaijan, Kyrgyzstan, Belarus and Kazakhstan reached the highest rate of GDP growth in the monitored period. On the other hand, Uzbekistan reached the worst results. Russia and Kazakhstan are the most efficient countries (regarding their GDP level). They also have the highest GDP per person in purchasing power parity. Ukraine has a significant potential, which has not been utilized though.

Regional integration is based on bringing economic development of individual countries together. However, in this case it is evident that, provided that there are significant differences in GDP per person (PPP), it is very difficult for the countries to be brought together (Fig. 1). A spill-out effect may play a certain role here, in which poorer countries might be benefiting from the presence of a more powerful neighbour and in which an increase in business transactions between these two countries takes place.

During the monitored years, five of the monitored countries did not record any decline in real GDP, namely Azerbaijan, Belarus, Kazakhstan, Tajikistan and Uzbekistan. Out of these, Azerbaijan reached

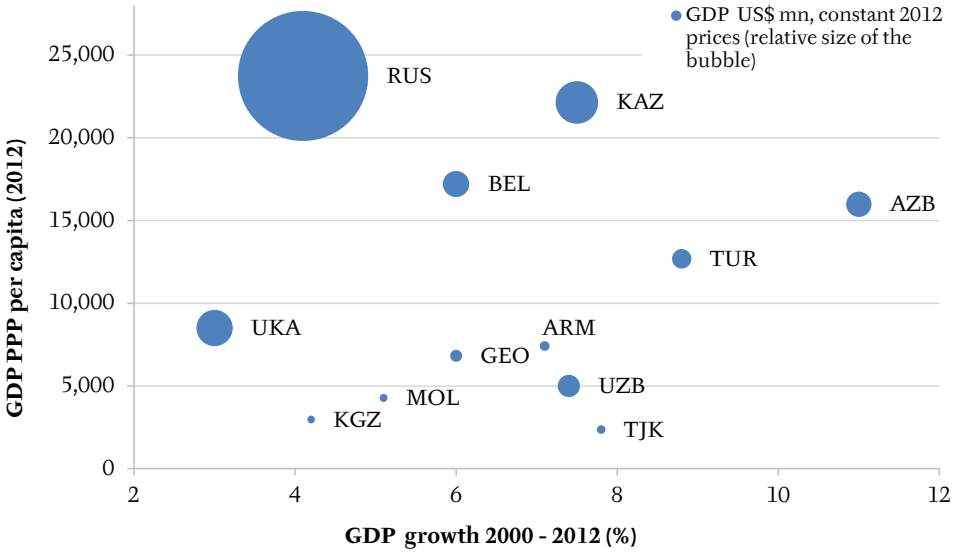
I: *Descriptive analysis of basic economic indicators*

	Range	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Government Final Consumption Expenditure	3,017,067.30	8,779.40	3,025,846.70	316,827.06	247,182.09	856,263.87
Net Exports of Goods and Services	1,596,584.10	–49,157.50	1,547,426.60	147,763.73	129,139.42	447,352.07
Private Final Consumption Expenditure	8,456,267.70	64,425.00	8,520,692.70	964,308.42	691,463.15	2,395,298.61
Increases in Stocks	242,019.60	–73,804.00	168,215.60	22,058.19	17,764.26	61,537.21
Gross Fixed Capital Formation	3,342,462.80	14,917.20	3,357,380.00	395,972.43	271,375.09	940,070.90
Average growth of GDP (in %) 2000–2013	8.00	3.00	11.00	6.50	0.65	2.24
Average growth of GDP (in %) 2009–2014	10.60	0.50	11.10	5.07	0.82	2.83
Unemployment rate	16.10	0.10	16.20	6.38	1.43	4.96
Inflation	16.70	1.40	18.10	7.12	1.29	4.48
National debt (% GDP)	62.70	8.50	71.20	31.25	5.31	18.39
Balance of payment (% GDP)	28.50	–14.60	13.90	–3.00	2.11	7.33

Source: own processing

the highest average rate of growth (11 %). Ukraine and Armenia, and also Turkmenistan, Russia and Moldova recorded the most significant decline in their economic performance as a result of the economic crisis (2009). Ukraine and Georgia reach the same rate of growth and have a similar GDP level per person, although the size of their economies differs. This fact is interesting because both Georgia and Ukraine are trying to minimize their connections to Russia.

In 2000–2014, the GDP value of the analysed countries increased from 1.3 billion USD to more than 2.5 billion USD with constant prices in 2014 (Tab. II). It was mainly Russia (67.6 %) and Kazakhstan (11.6 %) that contributed to this growth of GDP.



1: *Basic GDP indicators of the post-Soviet countries*
Source: own processing

II: *Contribution of each country to GDP growth within the monitored group of countries (%)*

Country	AR	AZ	BY	GE	KZ	KG	MO	RU	TJ	TM	UA	UZ
%	0.57	4.87	3.56	0.78	11.63	0.27	0.33	67.59	0.51	2.85	3.72	3.31

Source: Passport, own processing, 2015

The Russian Federation and Kazakhstan have for a long time been dominant in the monitored area, both generating more than 82 % of GDP in the monitored group of the countries, while the Russian Federation is the most important contributor with more than 73.6 %. The lowest contribution can be seen in Kyrgyzstan, Moldova and Tajikistan (under 0.4 %).

At the beginning of this century (after a substantial decline from the 1990s), all the post-Soviet republics recorded a high rate of growth which was influenced by their economic situation and by the global growth of GDP. In most cases, this growth was discontinued in 2009 when there was a substantial decline due to the global economic crisis.

In 2010, the Russian economy grew at 4.5 % a year; in 2014 it reached growth of only 0.7 %. A similar considerable decline was evident in Belarus as well. Overall, we can say that the increase/decrease of GDP is similar in all the countries. Azerbaijan is the only exception in this case, the economy of which grew in 2006 at almost 35 %. Long-term, there was a gradual decrease of the rate of growth in all the monitored countries.

Should the individual countries be compared only according to their growth of GDP and GDP per person in the purchasing power parity, it will be discovered that the situation improved in all the monitored countries in the monitored period. Kazakhstan made the greatest progress, whose GDP in PPP (expressed in international dollar per person) increased by 15,245, followed by Russia. Azerbaijan, Belarus and Turkmenistan recorded an increase by more than 10,000 as well. Tajikistan ($1,450) and Kyrgyzstan ($1,582) recorded the worst results.

Only three countries reached growth of GDP, namely Kyrgyzstan, Uzbekistan and Moldova. On the other hand, Turkmenistan and Ukraine recorded the highest decrease. Based on the GDP development in PPP, the countries can be divided into three groups. The first will include Kazakhstan, Russia, Azerbaijan, Turkmenistan and Belarus whose GDP in PPP is higher than $14,000. At the same time, these countries' rate of growth has slowed down though. The second group comprises the countries with GDP growth – Moldova, Kyrgyzstan and Uzbekistan. The last group consists of Armenia, Georgia, Ukraine and Tajikistan, that is of the countries which recorded a real decline in the rate of GDP growth.

Sources of GDP growth

The contribution of individual components to growth of real GDP is also an important indicator. It documents the main drivers of growth across the post-Soviet countries. The following figure 2 documents the development. A different trend can be seen in each country, it is rather divergent over the monitored period.

Until 2006, private consumption (C) had been on the increase. It reached important values in all the monitored countries, starting from 2000, when the lowest median value was recorded (1.54 %), there was a gradual increase to as much as 8.2 % in 2006. Afterwards, there was a slight decrease. A change occurred in 2008 when there was a decline connected with the global economic crisis.

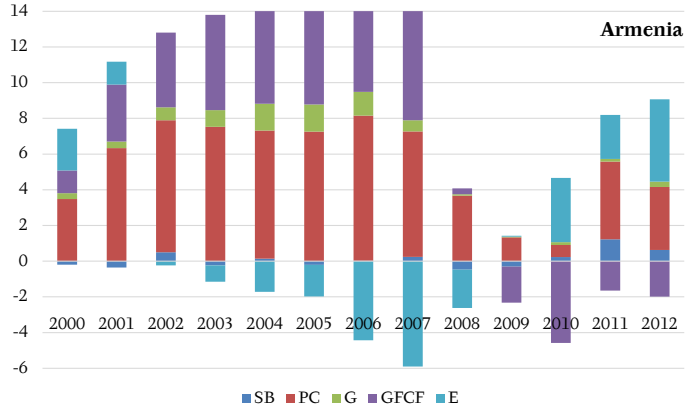
Tajikistan was an exception in this case, whose GDP growth is primarily dependent on the growth of household consumption. Regarding Azerbaijan or Kyrgyzstan, there was a substantial drop. After stagnation in 2010, the median value started increasing slightly in the following years. The highest differences between the countries were reached in 2001, 2004 and 2006. On the contrary, the lowest difference was recorded in 2012.

Significant differences are also evident in government expenditures (G). Some of the monitored countries do not demonstrate almost any contribution of government consumption to GDP growth (Belarus, Kyrgyzstan or Tajikistan). On the contrary, government consumption is an important factor for economic growth in Azerbaijan or Uzbekistan. The importance of government expenditures can be expected in Russia; however, after 2009 a decline can be seen there as well.

Overall, it could be stated that government consumption does not represent a significant contribution to GDP growth. In some countries, in most of the monitored years this is contrary, when the rate of growth was slowed down by it. The greatest difference in the contribution of government consumption to GDP between individual countries was reached in 2000, 2007, 2006 and 2005. On the contrary, the highest homogeneity of individual countries was recorded in 2012, 2002 and 2003.

Creation of gross fixed investment is another component of GDP creation. This component is a very important contributor in Belarus, Russia or Uzbekistan. On the other hand, Tajikistan is a country with a negative component. A similar situation occurred between 2008 and 2010 in Ukraine. In this period, the component constituted a significant proportion in Belarus or Uzbekistan. Creation of gross fixed capital represents an unimportant proportion in Tajikistan, Georgia or, in recent years, in Azerbaijan.

Regarding export-oriented countries, a contribution of net exports to GDP creation is a significant component. However, these countries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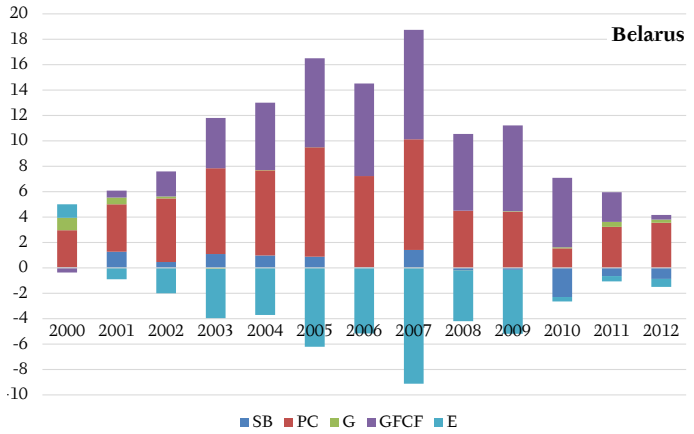
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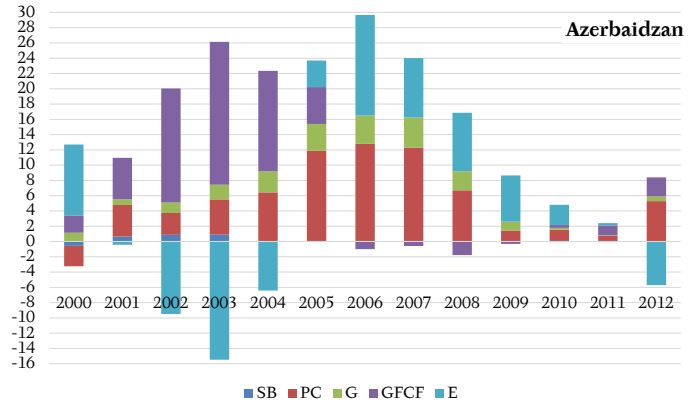
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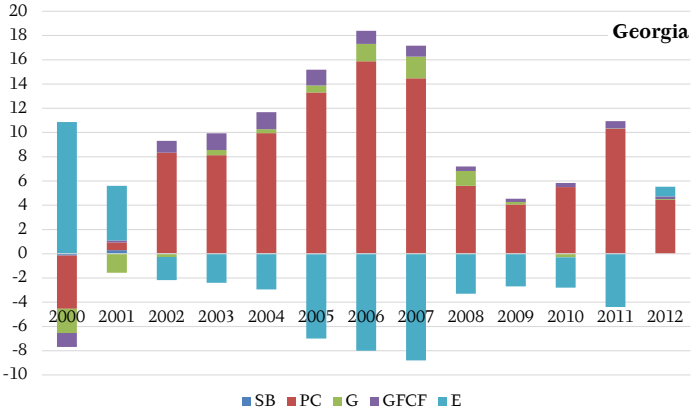
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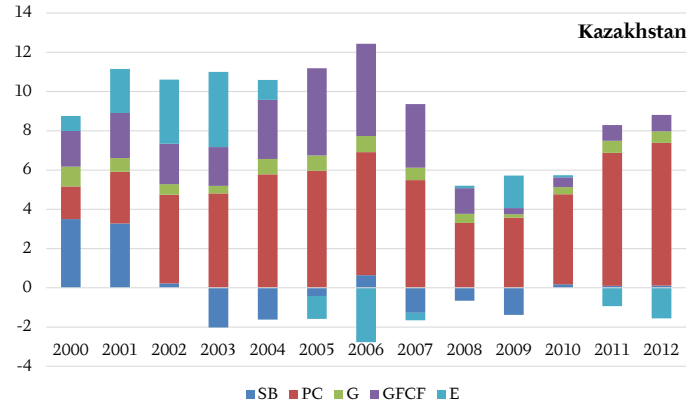
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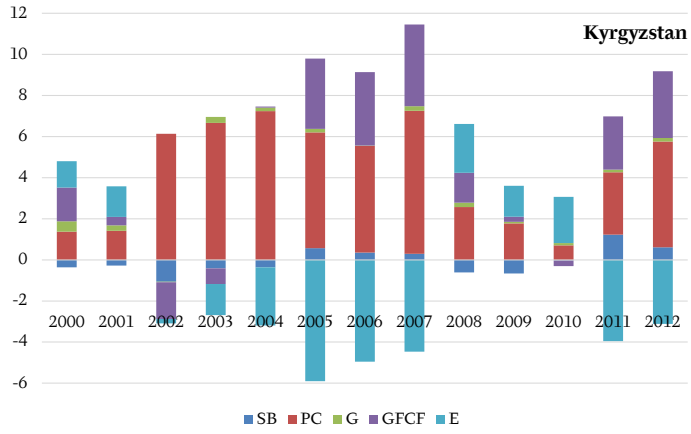
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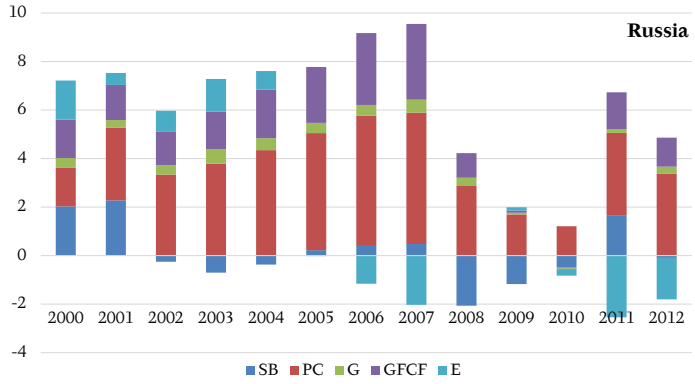
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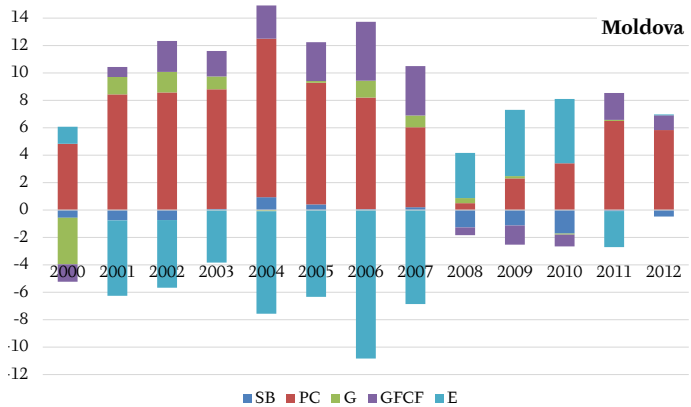
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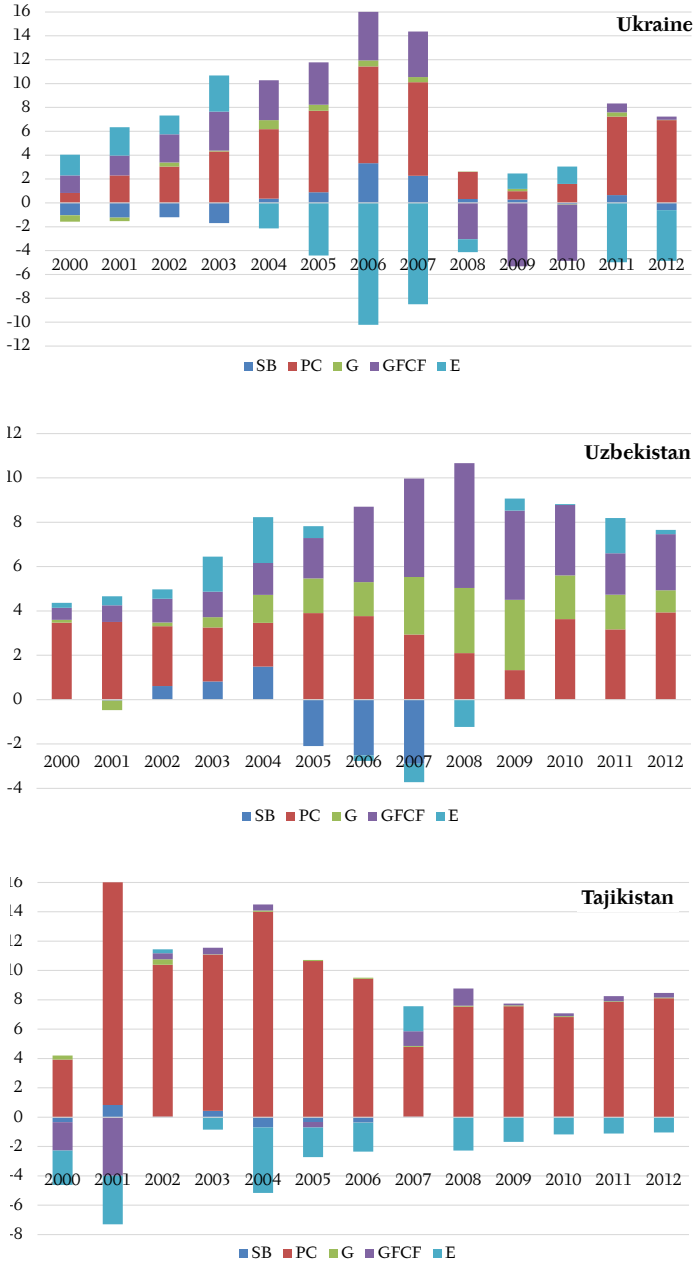


2: *CONTRIBUTION TO REAL GDP GROWTH (%)*
Note: SB – Stockbuilding; PB – Private consumption; G – Government consumption; GFCF – Gross fixed investment; E – External balance-export.
Source: Passport, own processing, 2015

must export products with high added value and import primary products more.

When the situation of each country in terms of its regional or international cooperation and economic focus is taken into account, a significant contribution of net exports to GDP may be expected in some of the participating countries. Azerbaijan or Uzbekistan are countries in which the contribution of net exports to GDP is a substantial component. However, the contribution is decreasing in both of these countries. Azerbaijan recorded the highest contribution in 2007, Uzbekistan in 2009. Georgia also recorded a similar increase followed by a decline (although the contribution was no so significant in this case).

The position of Azerbaijan in this case is rather interesting, because until 2003 its export had not belonged to the key components in GDP creation GDP and two years later the situation changed dramatically and the component is now a significant part of the country's GDP growth.

If overall development is taken into account, we can conclude that between 2002 and 2008 the median of this component of GDP was even

negative. The median reached negative values in 2011 and 2012. The broadest range was recorded in 2006, which also corresponds with the development of the balance of payments.

Stockbuilding is the last component of an expenditure method for measuring GDP. It is not an important contributor to GDP creation in the monitored countries. In all the monitored years, the median value oscillates around zero. The broadest range can be recorded in 2006 and 2007, when inventories were an important contributor to GDP growth in Ukraine.

GDP growth of individual countries reacts differently to changes in the components participating in its creation (Tab. III). Household consumption was the main source of GDP growth in each country in the monitored period. Nevertheless, its contribution to creation of GDP differed rather significantly in each country. Gross fixed investments also contributed greatly to GDP creation, although their share in GDP growth was not as distinct as household consumption (Armenia and Tajikistan were an exception in this regard). Government consumption contributed to GDP growth only to some extent (the Russian Federation, Armenia, Azerbaijan and Moldova are exceptions here). Inventories had a relatively insignificant or even negative impact on GDP creation in individual countries. The balance of activities in connection with the external market had a negative influence on the development of the GDP value itself in the majority of the countries (this became evident mainly as a result of decreasing prices of mineral resources and of a growing demand for foreign products and services). Armenia and Azerbaijan were exceptions in this regard, as well as Kazakhstan and Uzbekistan to a certain extent.

A considerable decline of prices of mineral resources as well as the economic embargo have dramatically hindered economic growth in the region, namely in the Russian Federation, on which other countries are more or less (rather more) dependent. The table III provides an overview of a relation existing in the monitored countries between the development of their own GDP and its individual monitored components.

Tab. IV then provides a closer look at GDP creation in the monitored countries, and serves as an overview of GDP sensitivity to the development of the value of its components.

A significant contribution of household consumption and gross fixed investments to GDP creation is evident again (apart from some exceptions). However, in connection with the value development of inventories mainly and of external balancing, GDP elasticity of a number of the monitored countries is even negative. With some exceptions, the majority of monitored relations show a non-elastic relationship between a relative change of the endogenous variable (expressed in %) and one-percent change of the exogenous variable. The analysis of elasticity also provides rather interesting findings concerning the impact of external balance on GDP creation, in which external economic relations work as a very elastic/sensitive source of economic growth – however, this fact works both ways (growth/decline). Given the fact that Russian export is primarily founded on mineral resources, it is largely dependent on the development of world prices which, especially regarding mineral resources, have recently been decreasing rapidly, which consequently manifests itself in a significant reduction of the value of exports, or in the reduction of the value of an export surplus.

Tab. V contains the results of the models estimated based on the panel data of the parts of GDP creation. The parameters were estimated for the selected post-Soviet countries in the period between 2000 and 2014. The data files allow us to estimate

III: *Correlation of the components creating the final GDP in relation to the development of the GDP value of each monitored country in the monitored period 2000–2014 (%)*

Correlation in relation to GDP	Stockbuilding, contribution to real GDP growth	Private consumption, contribution to real GDP growth	Government consumption, contribution to real GDP growth	Gross fixed investment, contribution to real GDP growth	External balance, contribution to real GDP growth
Armenia	0.661	0.337	0.265	0.423	0.372
Azerbaijan	–0.353	0.667	0.708	–0.213	0.209
Belarus	0.284	0.879	0.021	0.861	0.510
Georgia	–0.434	0.923	0.306	0.887	0.773
Kazakhstan	–0.204	0.953	0.755	0.394	–0.558
Kyrgyzstan	0.547	0.612	0.752	0.445	0.260
Moldova	0.726	0.566	0.076	0.412	0.594
Russia	0.918	0.923	0.608	0.569	0.561
Tajikistan	–0.331	0.298	–0.090	0.260	–0.226
Ukraine	0.150	0.178	0.769	0.941	0.366
Uzbekistan	–0.122	–0.608	0.400	0.452	0.242

Source: Passport, own processing, 2015

IV: *Sensitivity to development of GDP value in relation to percentage change of the value of the monitored component contributing to creation of the GDP value in each monitored country*

Elasticity (%)	Stockbuilding	Private consumption	Government consumption	Gross fixed investment	External balance
Armenia	0.4597	–0.0540	–0.0979	0.3190	–0.1631
Azerbaijan	0.5105	0.3699	2.2003	0.7567	0.1517
Belarus	–0.4444	–0.0841	–0.0483	1.2210	0.0337
Georgia	–0.3637	0.5718	0.5263	0.9631	–0.6518
Kazakhstan	–0.0086	0.1663	0.1956	0.6469	–0.6493
Kyrgyzstan	0.5350	0.5177	0.3893	0.1947	–1.2965
Moldova	0.3139	0.8783	–0.0655	0.8211	–0.5322
Russia	–0.4286	0.8134	0.6584	–0.9124	2.2481
Tajikistan	–0.0125	0.9844	0.0882	0.4100	–0.6829
Ukraine	–0.0989	–0.1011	0.4087	0.1570	0.2574
Uzbekistan	–0.0829	–0.8057	0.2625	0.3729	0.0132

Source: Passport, own processing, 2015

several models in the linear and non-linear form. The explanatory variables are in all the models: Government Final Consumption Expenditure (GCE), Gross Fixed Capital Formation (FC), Increases in Stocks (Stocks), Private Final Consumption Expenditure (PCE), and Net Exports of Goods and Services (Export). Tab. V shows the results of the three models that can be considered the best.

The first GDP model is a linear model estimated using the ordinary least square method (OLS), the second is based on the power function and estimated using OLS, and the third model is based on the power function and the GLS method was used in this case only. From an economic and statistical point of view, all three models can be regarded as suitable. However, the problem of autocorrelation of residuals and heteroscedasticity is evident in models 1 and 2. For this reason, the generalized least square method was used to estimate the parameters of the third model instead of the ordinary least square method. The last model estimated using the GLS method can be considered the most suitable in terms of meeting the preconditions for regression models and econometric verification and is therefore used for subsequent analysis. The final parameters of the estimated model can also be interpreted as elasticity coefficients that show sensitivity of GDP to changes in its individual components. Private consumption influences changes in GDP the most (the coefficient of elasticity reaches 0.7866), while stockbuilding is on the other side (coefficient of elasticity 0.0388).

The results of the panel data model show slightly different results from the sub-models of the GDP creation in individual countries. The results indicate that GDP is influenced by stockbuilding, private consumption, government consumption and external balance. If there is an increase in these components, GDP also increases. The growth of gross fixed investment is followed by a GDP decline. One of the reasons for the different results between the countries and for using the panel data model is Russia's dominant position.

However, the GDP response to the changes in individual components is rigid in all the cases.

Based on the previous analysis, we can divide the post-Soviet countries into 3 + 1 groups (Fig. 3). The first group consists of Armenia, Kyrgyzstan and Uzbekistan. The second contains Belarus, Kazakhstan, Russia and Ukraine. The third group comprises Georgia, Moldova and Tajikistan. Azerbaijan has a special position in this regard.

As is evident, the first group consists of mostly agricultural countries with a high share of gross fixed investment and government expenditure. The second group of countries represents the strongest economies in the analysed group. Their contribution of industry and services to GDP creation is high and their stockbuilding position is strong. The third group is less homogenous, and it can be stated that these countries have the highest contribution of private consumption to GDP creation and negative contribution of gross fixed investment and export. Azerbaijan is special due to its high contribution of industry to GDP, insufficient agriculture and services and a very high gross fixed investment.

DISCUSSION

Convergence between countries is frequently mentioned as a necessary precondition for any kind of regional cooperation. The situation in the post-Soviet countries can be considered problematic. After analyzing their economic situation, substantial differences have been discovered, especially in their economic growth. These findings correspond with those of Libman and Vinokurov (2011) and Zubarevich and Safronov (2011) whose research was based on Ukraine, Russia and Kazakhstan only. However, the conclusion could be that there is significant spatial heterogeneity in the distribution of the GDP per capita and according to Le Gallo

V: *GDP models estimated on panel data*

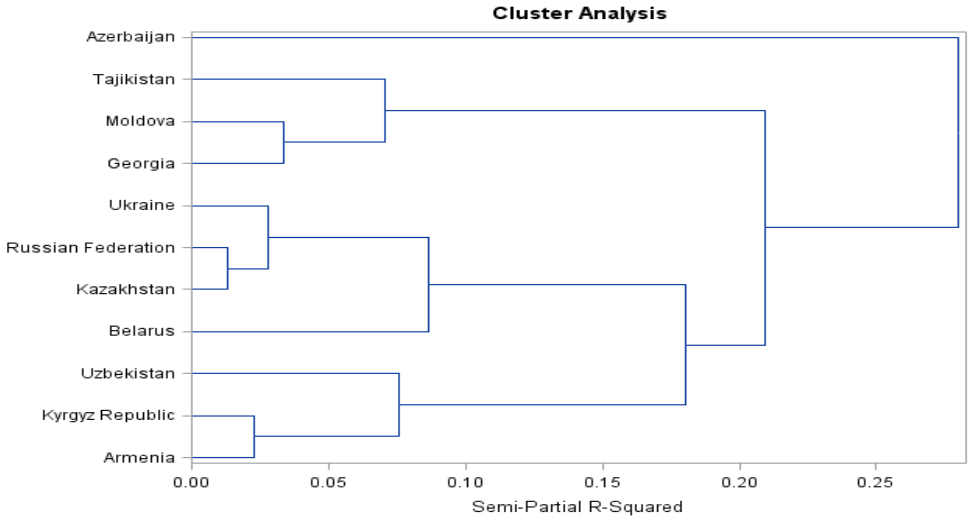
GDP	Model 1	p-value	Model 2	P-value	Model 3	P-value
Constant	11,115.3	***	2.4631	***	2.5801	***
GCE	1.3497		0.2768	*	0.3336	**
FC	-0.7491	*	-0.3370	***	-0.3532	***
Stocks	0.6957	**	0.0365	**	0.0388	***
PCE	1.2301	***	0.8360	***	0.7866	***
Export	3.5484	***	0.0775	***	0.0802	***
R^2	0.9893		0.9890		0.9961	

Note: P-value ***p < 0.01, **p < 0.05 and *p < 0.10
Source: Passport, own processing, 2016

and Ertur (2003) this is the indicator of regional disparities.

On the other hand, the individual economies show a high level of interconnection and synchronization of their own economic cycle. This is closely connected with the statements of Borts and Stein (1964) and Wiliamson (1965)

This fact has already been mentioned by Libman (2006). As it is evident, since 2006 the situation has not changed significantly. There is a considerable potential for economic cooperation among the countries, which can be deepened extensively, provided that a number of political and power tensions and conflicts existing between individual countries are solved. They have a population of more than 250 million and their GDP reaches considerable values. If functioning regional integration is created in the region, then there is a really high potential for further economic growth in the region. At the same time, however, economic power within the region will be distributed unequally, with Russia and Kazakhstan on one side, and the remaining countries on the other. Ukraine, a strong regional player, is "out of the game" at the moment, with economic and political instability ruling the country.



3: *Cluster analysis of the post-soviet countries*
Note: The data for Turkmenistan are not available.
Source: Passport, own processing, 2015

CONCLUSION

Cooperation of the post-Soviet countries is a widely discussed topic among politicians as well as economists. The problem is that there is no real progress toward its fulfilment, with a number of unsuccessful attempts already made and a number of hypotheses already presented about different integration theories.

This paper analysed the situation of these countries with regard to GDP. First of all, some commonalities must be present between the countries in order for them to be able to create functional cooperation/integration. It is also important to be able to use the competitive advantage of the countries' production (however, this has not been part of this paper). The conclusion of our research is that even though there are significant differences between for example GDP per capita or in economic growth there is still similarity in the business cycle or even in GDP creation when private consumption and stockbuilding play the key role. At the same time, most of the countries have a negative contribution of export to their GDP, which is closely related to the structure of export itself and its dependency on primary products.

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