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THE MAIN VECTORS OF CROSS-BORDER DEVELOPMENT IN THE CIS INDUSTRIAL AND ECONOMIC SPACE: CONVERGENCE, POTENTIAL, CROSS-COUNTRY GAPS

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THE MAIN VECTORS OF CROSS-BORDER DEVELOPMENT IN THE CIS INDUSTRIAL AND ECONOMIC SPACE: CONVERGENCE, POTENTIAL, CROSS-COUNTRY GAPS[5]

The main goal of the study is to identify the scope and trends in the manufacturing development of Russia and other countries of the Commonwealth of Independent States (CIS) in the context of integration effectiveness, industrial policies quality and competitiveness growth. Under current unfavorable conditions – the fall in world oil prices, devaluation of national currencies, and reduction of business activity due to uncertainty of future strategies – the essential issue is whether the favorable integration possibilities of the past periods of intensive rise in 2005-2008 and 2010-2012 in the national economies development in the CIS region to build competitive potential for reindustrialization were fully realized.

The analyzed period 2005-2014 is presented by the authors as a reference period of economic dynamics, covering for Russia and the CIS countries a full business cycle from the beginning of one deep recession (2008-2009) until another recession (2014).The research object is manufacturing sectors in Russia and other CIS countries. The study results show that in the analyzed period, large-scale industrialization has not occurred in these countries, largely due to the lack of the national economies structural transformations. The impressive manufacturing growth in a number of smaller CIS countries has not led to those countries' participation in the highly competitive international processes. By the end of the analyzed period, the need for diversification of the national economies and exports and implementation of balanced economic policies only intensified. These policies should support both structural reforms and demand and be aimed to increase productivity, eliminate barriers of the manufacturing development and enable foreign markets access.

Keywords: industrialization, manufacturing, structural changes, industrial potential, export potential

JEL Classification: E32, L16, O14, O25, O47, O57

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Introduction

Long-term trends in the dynamics of countries cross-border cooperation, especially in the context of competitive industrial development, are an important subject of contemporary economic research. For the countries-participants of the Commonwealth of Independent States (CIS), the implementation of integration measures and cooperation in innovative industrial sectors can have a strong multiplier effect on other economic sectors [Vinokurov and Libman, 2012], [Vinokurov et al, 2015], [Eurasian Development Bank, 2015a, 2015b, 2013]. The industrial sectors that are focused on the import substitution from third countries by comparable quality production depending on specialization of the stronger integration members can get new development [Fedorov, 2014], [Panteleyev et al, 2015], [Eurasian Development Bank, 2014]. In the last two years, economic development in the CIS region was characterized by increased uncertainty of the main integration strategies largely due to the fall in world oil prices, changes in the oil market structure, ambiguity of monetary policies of countries-issuers of reserve currency, devaluation effect of the national CIS countries currencies, decrease in business activity[The Central Bank of the Russian Federation,2014, 2015a, 2015b], [Gaidar Institute for Economic Policy, 2015], [Analytical Center for the Government of the Russian Federation, 2015], [International Monetary Fund, 2015, 2016b], [Bems et al, 2016]. In this study we realized an attempt to assess whether the favorable integration possibilities of the past periods of intensive rise in 2005-2008 and 2010-2012 in the national economies development in the CIS region to build competitive potential for reindustrialization were fully realized.

The main goal of the study is to identify the scope and trends in the manufacturing development of Russia and other CIS countries in the context of integration effectiveness, industrial policies quality and competitiveness growth. In this format, the key research questions are formulated as: resource growth or innovative manufacturing development; interpenetration or strengthening of borders?

The analyzed period 2005-2014 is presented by the authors as a reference period of economic dynamics, covering for Russia and the CIS countries a full business cycle from the beginning of one deep recession (2008-2009) until another recession (2014). The research object is the manufacturing sectors in Russia and other CIS countries– Azerbaijan, Armenia, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, and Ukraine.

The profound technological changes that affect all economic activities, and the rapid

emergence of new competitive advantages, contribute to the creation of an entirely different industrial context for each country, regardless of its level of income and development. The national economies should be able to fully participate in the global flows of goods and cost with maximum efficiency of all productivity factors. In that case it becomes possible to realize in full the production potential of new technologies. To become a beneficiary of global value chains, at least at some specific integration space, the countries need to develop sustainably not only such competitive factors as natural resources and labor, but also the required technological and organizational skills, as well as to implement fast and cheap communication, available infrastructure, the latest training programs, and an effective investment promotion strategy.

The success of the national industrial policies, aimed primarily at increasing the national high value-added sectors, largely depends on the ability to create a "punch list" of technological competence in as much as possible industrial activities to achieve the required coordination between national and international actors of the integrations, where the country is ready to participate. Today in Russia, under the new Law on Industry [Minpromtorg Rossii, 2014], the Government and the Ministry of Industry and Trade initiated the creation of a unified state interdepartmental information system of industrial statistics. The essential component of this system’s successful implementation is the harmonization of all its aspects – measures, samples, classifications, data collection procedures, and analytical tools – with international statistical practices.

Russia, like any CIS country, should be able to carry out all the required international comparisons, to measure the level and dynamics of the national industry indicators with regard to the informational counterpart of cross-border and strategically important states.

For a successful industrial policy, it is necessary, first of all, to assess properly the capacity of the national industry and its place in the global and regional economic environment; the countries’ ability to produce and export competitive manufacturing products, and to compare the industrial and export capacities of the country with peer or reference states.

Methodological support

The study presents an approach of the primary diagnostic of the national industrial policies efficiency, where selection, systematization of statistics measurers and data, evaluation and its table-graphic visualization are carried out in the cross-country comparisons format. According to the authors, the concept, under which the preliminary joint assessment of re-industrialization process in

countries integrated, in particular, by cross-border social and economic interests is carried out, can be defined as the concept of the industrial policy relative effectiveness. Herewith, the sequence of operations, the prior assessments and their visualization are available to users at all levels of governance and decision-making.

The proposed approach is used for the first time to estimate the trajectories of joint economic and industrial development in the CIS region for the period of 2005-2014. It is based on the actual tools "EQuIP – Enhancing the Quality of Industrial Policies" developed by German Development Cooperation and German Federal Enterprise for International Cooperation in the framework of joint activities with UNIDO on the evaluating of countries' inclusive economic growth and the Competitive Industrial Performance Index [UNIDO and GIZ, 2015] and has already been successfully applied to the analysis of re-industrialization processes in a number of countries [UNIDO, 2015a], [Government of Nepal, 2014], [Government of URT, 2012].

The proposed diagnostic procedure has a more extensive steps sequence that provides a general overview on the growth dynamics and structure of national economies, place and magnitude of the industrial sector, the intensity and changes in the impact of the sector both on each country and on the integration fields, in particular, of the CIS. An important aim of such an iterative assessment is to determine the successful episodes of industrialization, not only domestic, but also common in terms of the analyzed countries integration, which are characterized by sustainable growth over a long period of time.

The main aspects of this approach, consistently performed in the study for each country, are: the potential level and the short-term output gaps; convergence of growth cycles in the dynamics of the indices of the gross domestic product (GDP) growth and industrial production; the structure of the gross value added (GVA); the level of industrialization and sectoral distributions; structural changes in the overall economic and industrial development; the capacity to produce and export the basic industrial products; production and export potential; the importance and impact of the manufacturing sector on the total GVA in the CIS region; the relationship of growth and impact of GVA and exports in manufacturing; the summarizing comparative evaluation of the manufacturing in the integration.

As the main methodological features of the study we also consider:

– using only hard statistics of official organizations of all analyzed countries, comparable

and regularly published by a recognized international organization (organizations) in the CIS region in accordance with the following relevant to this study indicators.

- using only legitimate for the countries classifications for cross-country comparisons, which allows obtaining relevant assessments of heterogeneous samples;
- the combination of macro and sub-sectoral dynamics to obtain assessments up to 2-digit levels of national classifications compatible with the Statistical Classification of Economic Activities in the European Community (NACE Rev. 1.1.).

In the study we used the following time series for Russia and the CIS countries:

- Gross domestic product (GDP) of the countries in current and constant prices, million $US (at current exchange rate of the national currencies);
- Gross value added (GVA) of the countries in current and constant prices (total and by the main economic activities), million $US (at current exchange rate of the national currencies);
- Exports of the countries (total and by the main economic and industrial activities), at current prices, million $US;
- Industrial Production Index (for Russia only), %;
- Investments in fixed capital by the main economic activities (for Russia only), million rubles;
- Number of employees by the main economic activities (for Russia only), thousand persons;
- Labor productivity index by the main economic activities (for Russia only), %;
- Unemployment rate(for Russia only), %;
- Population of working age (for Russia only), thousand persons.

Using the information obtained, we calculated the following indicators for each country:

- GDP potential level and short-term output gaps;
- Long-term sustainable profile and short-term growth cycles;
- Share of GVA of the main economic activities, including industry, in the GDP, %;
- Industrial GVA per capita (total and by kinds of industrial activities); at constant prices, at current prices, $US;
- Share of industrial GVA of the country in the regional (CIS) industrial GVA (total and by kinds of industrial activities),%;
- Share of industrial exports in total exports of the countries (total and by kinds of industrial

activities), %;

- Industrial exports per capita (total and by kinds of industrial activities), at current prices, $US;
- Share of industrial exports of the country in the regional (CIS) industrial exports (total and by kinds of industrial activities),%;
- Aggregate average annual growth rate for GVA and exports, %;
- The growth rate (current quarter to the corresponding quarter of the previous year) for GVA and exports,%;
- Absolute change (year to year) for GVA and exports, in percentage points;
- Coefficient of absolute and relative structural changes;
- Integral coefficient of structural changes for GVA and exports.

As the main sources of information and analytical support we define:

- The unified interdepartmental information and statistical system of the Russian Federation Federal State Statistics Service (Rosstat)[6];
- Database "Statistics on the CIS" of the Interstate Statistical Committee of the Commonwealth of Independent States (CIS STAT)[7];
- Database of United Nations Conference on Trade and Development(UNCTADstat)[8];
- UNIDO project "EQuIP – Enhancing the Quality of Industrial Policies" [UNIDO, GIZ, 2015];
- International Recommendations on Industrial Statistics 2008 [UN, 2010];
- Industrial statistics: Guidelines and Methodology [UNIDO, 2010];
- UNIDO Report "The Role of Technology and Innovation in Inclusive and Sustainable Industrial Development"[UNIDO, 2015a].

All the measurements, in particular, the assessment of the scope and intensity of structural changes, industrial and export capacities, significance and impact of the country's manufacturing on the total GVA in the CIS region, etc. are based on CIS countries annual statistics over the period of 2005-2014; all data was evaluated in US$ according to the current exchange rates of national currencies.

[6] Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/databases/emiss/.
[7] Available at:http://www.cisstat.com/0base/index.htm.
[8] Available at:http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx.

Peculiarities of the Russian economic development since the recession 2014

Since 2014, the recessionary events in the Russian economy are aggravated. In prevailing conditions, the country needs more than ever in changing economic regime: it is vital to switch the economy of "rapid consumption growth" in the "supply-side" model with the basic strategy of expansion. Re-industrialization should gradually reduce the country's dependence on resource-based growth and contribute to innovative GVA creation.

Economic slowdown, which observed since the beginning of 2012, led to the protracted stagnation in 2013, primarily, in the real economy. The country’s vulnerability increased largely due to the lack of structural reforms, especially in industry. The relevant reforms would allow Russia to overcome inefficient allocation of production factors, presence of non-competitive markets, lack of innovation, corruption phenomenon, and strong dependence on the world commodity markets. In the second half of 2014, the recessionary events increased, business environment as well as entrepreneurial and consumer sentiment deteriorated rapid. Intensified geopolitical tensions, political risks and external shocks escalation, substantial restriction of access to international financial markets for Russian banks and non-financial institutions, and the sanctions on the high technology exports – all these factors contributed to the negative economic development. At the same time, the sharp decline in investment flows and innovative technologies transfer impede the successful launch of import substitution program.

By the end of 2014, the fall in global commodity prices, the high currency and stock markets volatility in the absence of country’s countervailing economic policies contributed to the first sharp depreciation of national currency and to inflation increase.

Since the beginning of 2015, decline in real income of population began simultaneously with accumulation of the debt burden as the delayed effect of large-scale consumer loans in previous years. At this time, consumption has ceased to be a driver of economic growth. The economic prospects were becoming less predictable for economic agents; it significantly exacerbated the crisis of confidence in investment and production decision-making.

Over the 2015, some measures to stabilize the recessionary events and consumer confidence were taken. The most successful countercyclical responses allowed restraining the crisis escalation and significant deterioration in living standard of population, as well as adapting entrepreneurial

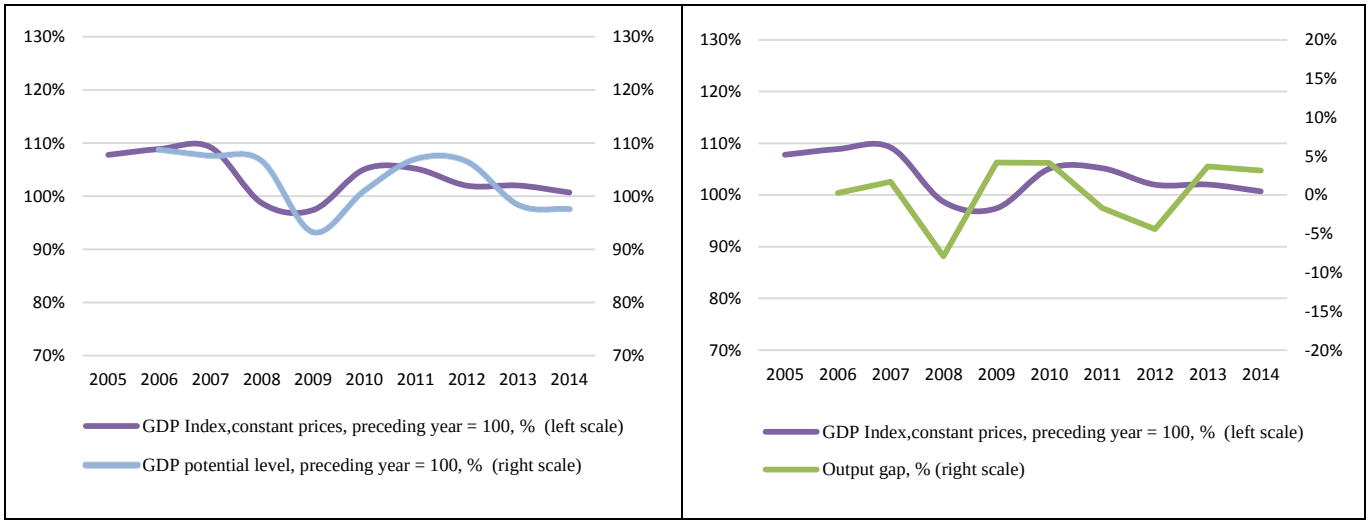
sentiment to rapidly changing business environment. Among them it should be noted the following measures: floating exchange rate implementation; expansion of monetary liquidity; mitigation of regulators and implementation the capital support program; fiscal stimulus; buffer reserves conservation; and energy subsidies reduction. At the same time the wages indexation was restricted and the level of insured private deposits was doubled. This helped to maintain social transfers and to continue the pension reform.

Accumulated since 2010 significant buffer stocks in the Reserve Fund, control the budgetary expenditure growth in line with inflation, low public debt (10-15% of GDP), and the current trading surplus were the crucial factors, which constrain risk of systemic crisis events in Russia.

At the same time, the prospects for successful economic transformation till the end of 2016 are not obvious. The capitals required for the investment decisions implementation are becoming more sensitive to the Russian political cycle. It is impossible to save the budget for a long time by reducing social spending. Decline in oil demand increases pressure on the country's payments balance, limits the possibilities of fiscal policy to stimulate the economy and provide demand – that, in turn, contributes to increased economic uncertainty. Nevertheless, ineffective budget expenditures with a low multiplier effect on the economy continue to expand. Strong administrative and structural barriers, exchange rate volatility, more expensive loans, uncertainty associated with the sanctions duration, and transfer of the ruble devaluation on prices do not promote increase in demand and profitability of investment projects. As a result, the backlog in the budget revenues growth increasingly breaks the budget balance and reduces the possibility of its involvement in anti-crisis regulation.

Assessment of the macroeconomic growth in Russia: Decomposition results

Consider the dynamics of Russian gross domestic product (GDP)growth in 2005-2015 under the neo-Keynesian economic theory. Under this theory, the unobservable GDP growth component, namely, its potential level corresponds to the price level equilibrium, and its short-term gaps with the real dynamics reflect process of prices and wages adaptation to shocks [Dornbush and Fisher, 1994], [Blanchard, 2000], [Mankiw, 2009], [Sacks and Larrain, 1993], [Mankiw and Romer, 1991], [Abel et al, 2008]. Hence, the empirical assessment of the potential level (Figure 1) reflects the total output when the economy does not create a downward or upward pressure on production costs and, consequently, inflation.



Source: Rosstat, authors' calculations, the method of production function (Cobb-Douglas), the IMF recommendations.

Fig. 1. Economic growth, potential level and short-term output gap in 2005-2014 (empirical evaluation)

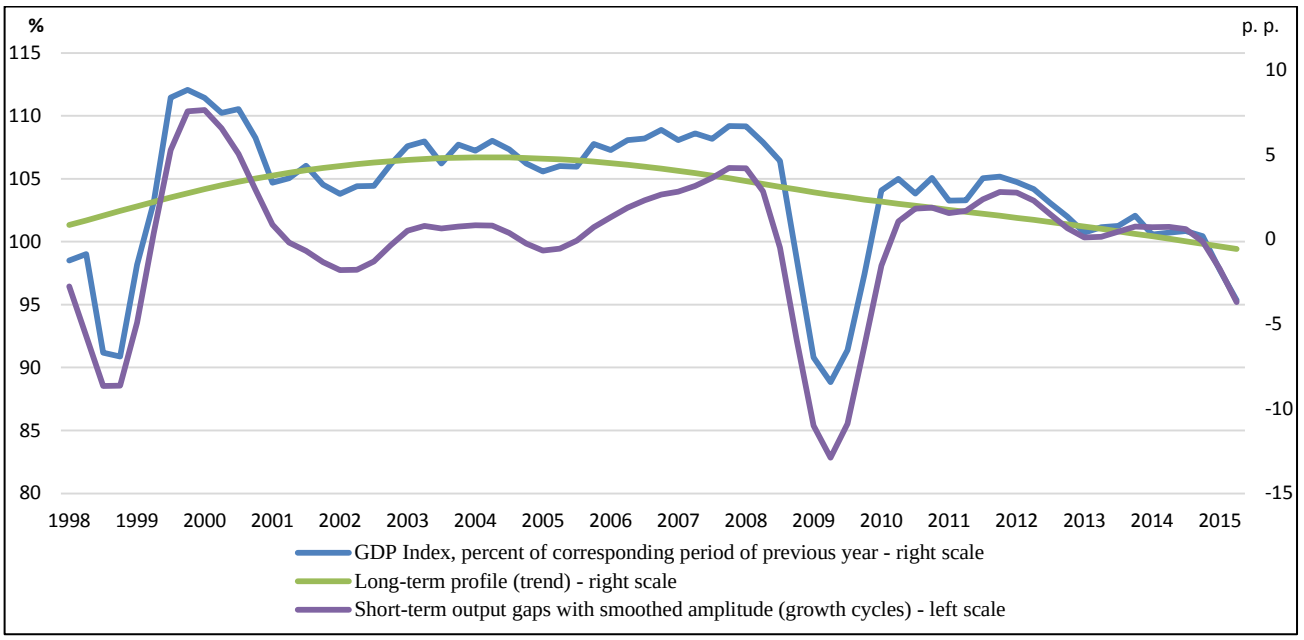
The negative output gaps indicate the underutilization of capital and labor, which determines a need to mitigate the macroeconomic effects. According to the International Monetary Fund (IMF) recommendations, the calculations of these dynamics' components for Russia are complicated by a number of noise effects: a strong dependence on oil, a high sectoral and territorial heterogeneity, energy dominance in the national exports[IMF 2014]. However, according to the calculations results, a positive output gap is observed in recent years. Such output gap is defined as an inflationary pressure indicator and demonstrates that the real inflation increasingly exceeded the targets in 2015; that, in its turn, greatly limits the monetary policy possibility.

In the reporting period, we can observe the following trends. After the crisis in 2008-2009, the dynamics of GDP potential level decreased clearly, and the economy operated above its potentials. This contributed to uncertainty growth and complicated the budget reserve up building. Among the main factors that reduce the potential level of national economic growth in this period prevailed:

- stabilization and subsequent significant fall in oil prices;
- delay of structural reforms;
- total factor productivity, especially capital, growth decline;
- unfavorable demographic situation and a low retirement age;
- poor investment support and a marked reduction in foreign investment;
- infrastructure deficiencies;
- a significant presence of state enterprises in key industrial sub-sectors.

Convergence in the CIS: the cyclical correlations in economic growth dynamics

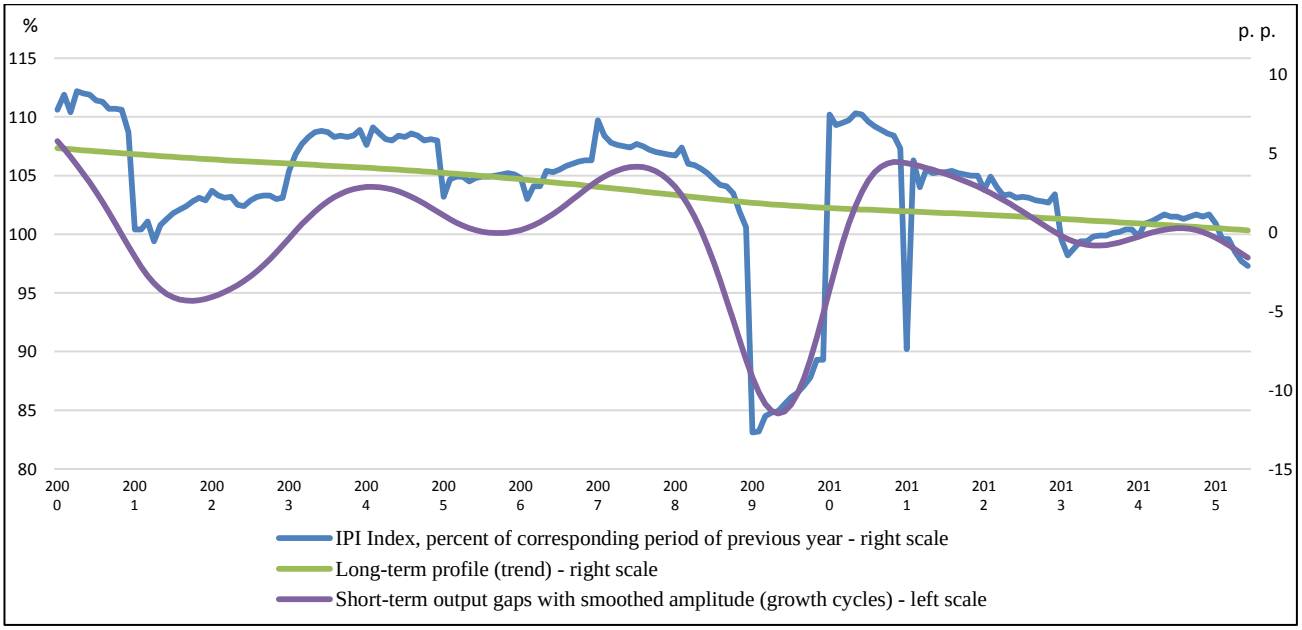
Another aspect of the macro dynamics decomposition is an identification of long-term sustainable profile and short-term growth cycles[9]in the aggregate cyclical economic development of Russia and the other CIS countries. Fig. 2 and 3 present the empirical evaluation of long-term trends and short-term gaps (in terms of the output gap theory) with smoothed amplitude. For the period of 1998-2015,these figures visualize four peaks and four troughs in the short-term cyclical movement of GDP and the industrial production indicator – IPI (the last – only for Russia) and beginning the fifth GDP growth cycle in 2012 (for IPI – one year earlier). Note that the end of 2015 is the lowest point for the both indicators' cyclic movement during the last six years.



Source: Rosstat, authors' calculations, Hodrick-Prescott statistical filter (double pass).

Fig. 2. The cyclic nature of economic growth in Russia: long-term sustainable profile and short-term growth cycles (1998–2015)

[9]The OECD concept is used; under this concept, a short-term growth cycle in economic activity is a deviation from the long-term sustainable level (trend) [OECD, 2016].



Source: Rosstat, authors' calculations, Hodrick-Prescott statistical filter (double pass).

Fig. 3.The cyclical nature of industrial growth in Russia: long-term sustainable profile and short-term growth cycles (1998-2015)

We use the tracers of short-term cyclical profiles in the analyzed indicators time series to visualize the short-term growth cycles. The tracers' construction is based on the EU concept; therefore we keep the proposed by EU quadrants location and cyclic movement direction [European Commission, 2015]. At the same time, in this study, the tracers are constructed through double-pass Hodrick-Prescott statistical filter. The first pass provides removing the long-term trend (15 years) impact, the second pass – extracting the short-term growth cycle with amplitude of 30 months and smoothing fluctuations, which are insignificant within the growth cycles decomposition. These periods were pre-selected empirically [Kitrar et al., 2014, 2015]. The tracers of short-term cyclical profiles in the GDP and IPI dynamics for Russia are presented in Figures 4 and 5.

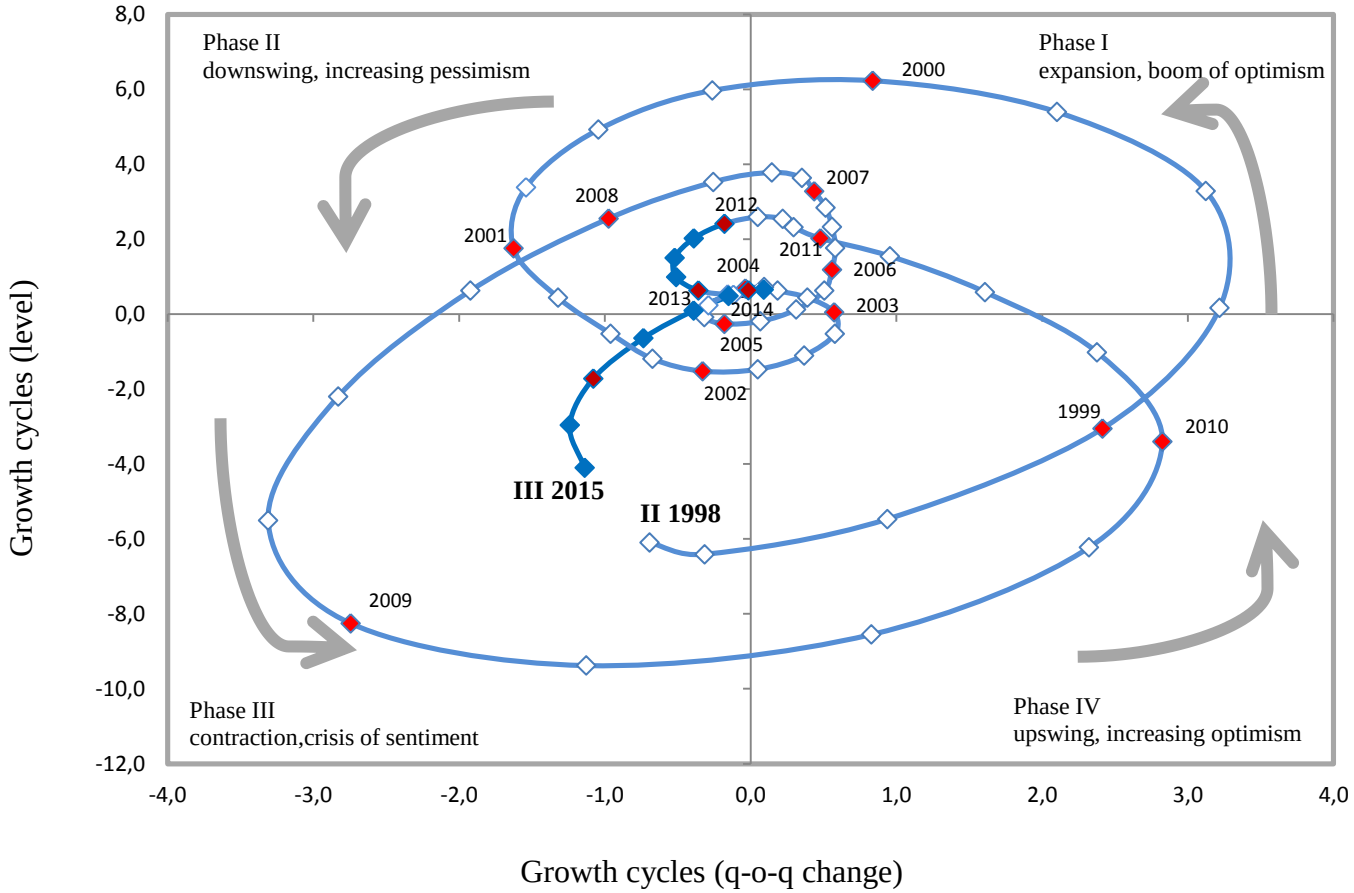


Fig. 4.Tracer of short-term cyclical profiles in the Russian GDP dynamics

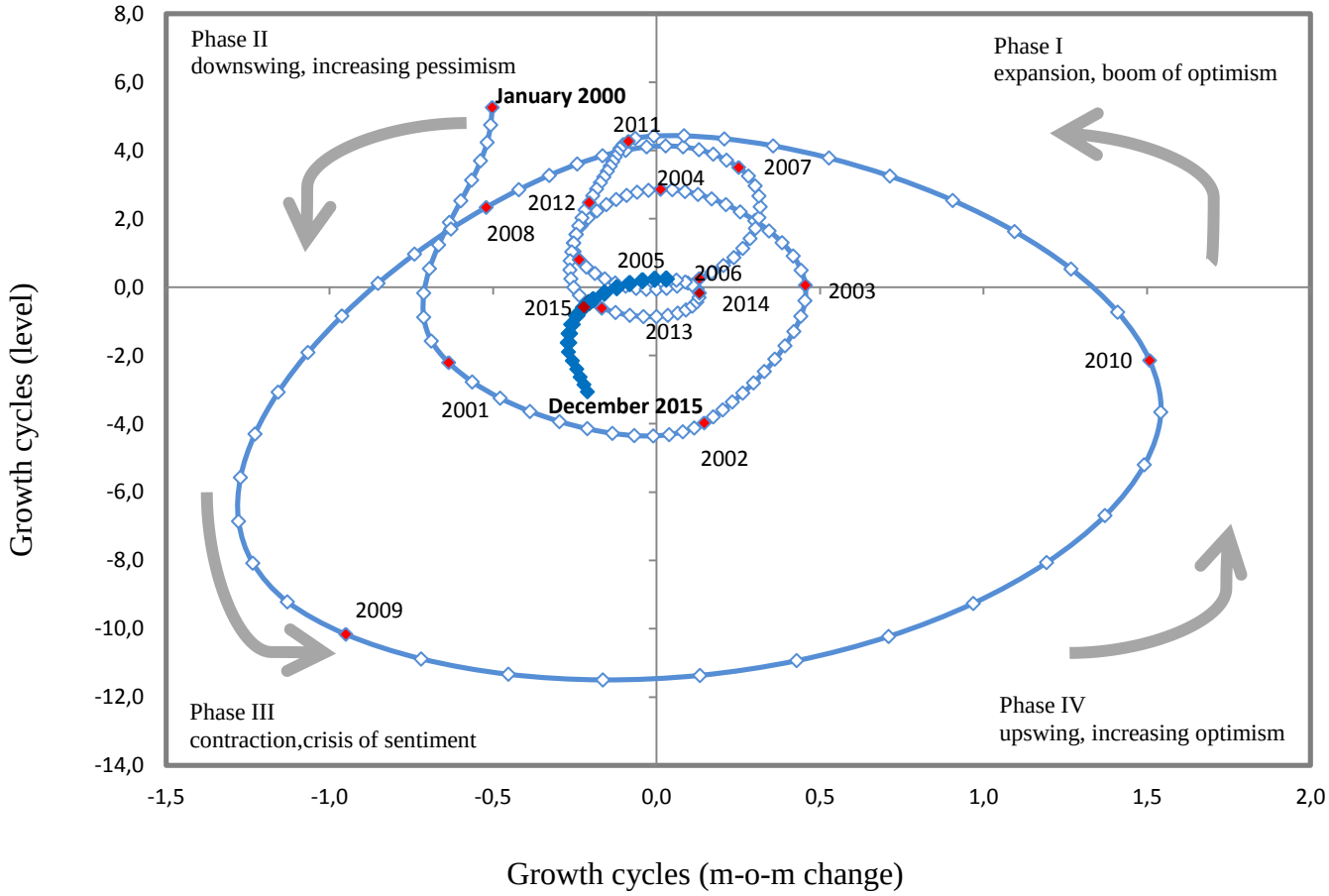


Fig. 5. Tracer of short-term cyclical profiles in the Russian IPI dynamics

In the proposed graphical representation, the Y-axis is the levels of GDP (IPI) short-term cycle time series, and the X-axis is their quarterly changes in absolute terms. Therefore, the tracer shows both the level and changes in the short-term cyclical movement of the analyzed economic indicators by visualizing the four quadrants of the trajectory according to the following four cycle's phases:

- top right quadrant I (growth expansion phase) corresponds to intensive short-term growth of the indicator at an above average level (the origin of coordinates) –high optimism;
- top left quadrant II (downswing phase) –slowdown in the indicator growth at an above average level–increasing pessimism;
- bottom left quadrant III (contraction, recession phase) – decrease in the short-term indicator growth a below average level – crisis of sentiment;
- bottom right quadrant IV (upswing, recovery phase) – growth of the indicator at a below average level –increasing optimism.

Four quadrants correspond to the four cycle's phases and are crossed by tracer

counter-clockwise. Cyclical peaks (economy overheating) are situated in the top center of the graph, cyclical troughs (depression, crises) – in the bottom center.

The tracers reflect the all five short-term growth cycle in the GDP and IPI dynamics in Russia. Both indicators after a prolonged stagnation (GDP since the beginning of 2012 and IPI one year earlier) crossed the expansion area border and began to move into the downswing phase, showing a steady deceleration with approximately the same intensity. Then, from the middle of 2014, the indicators moved into a cyclic contraction phase, characterized by an intense increase of recessionary economic events. The significant distance of the last values to the Y-axis still does not indicate the approach to a new cyclical turning point.

Thus, systemic characteristic of the current economic development in Russia is the transition to a lower growth path as a result of the downward shift of the potential GDP level and the entry a deep recession phase in the most protracted fifth growth cycle.

To visualize the cyclic interdependence of the countries as the aspect of their convergence in the CIS economic space, look at the economic growth tracers for all integration’s countries (Figure 6).

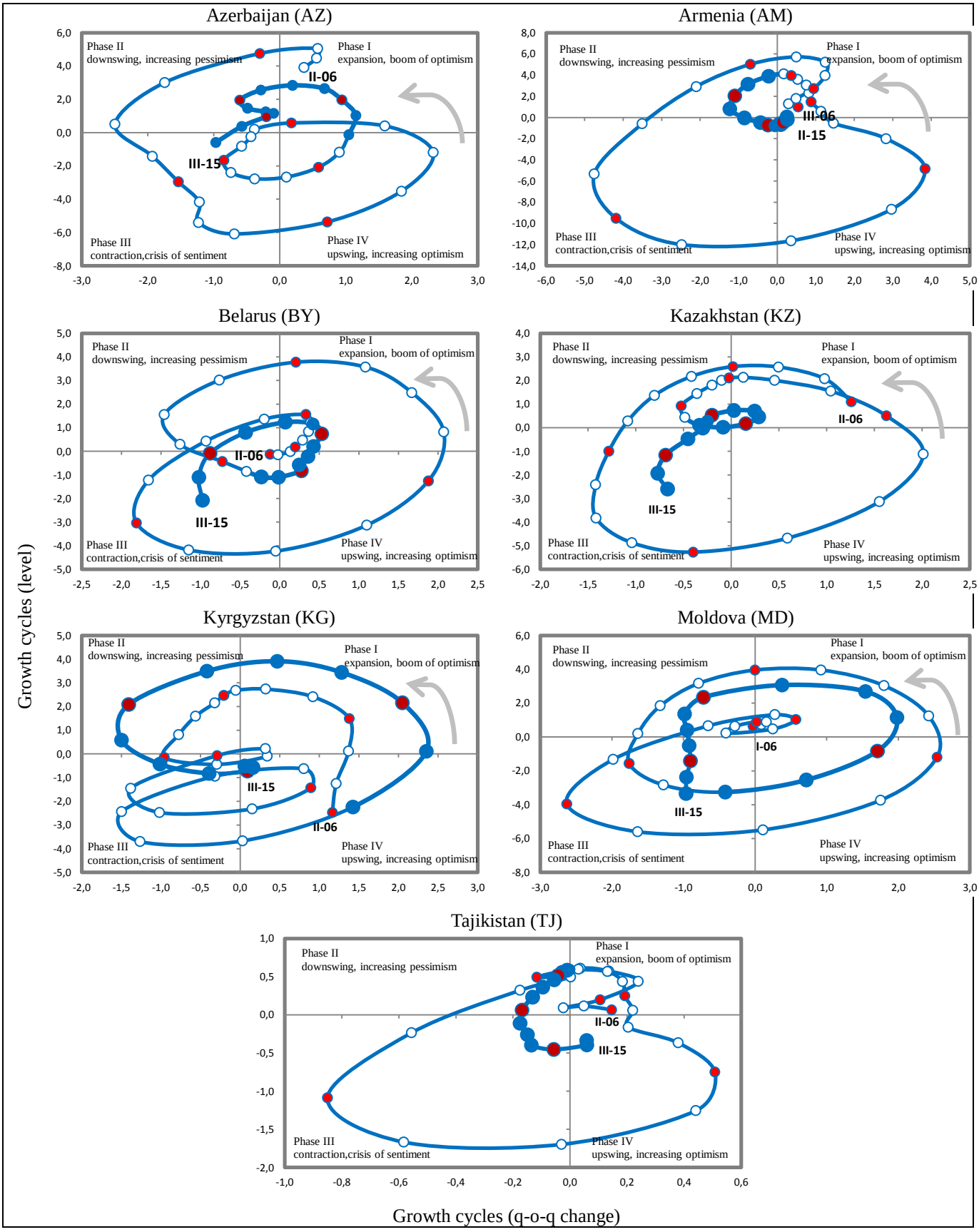


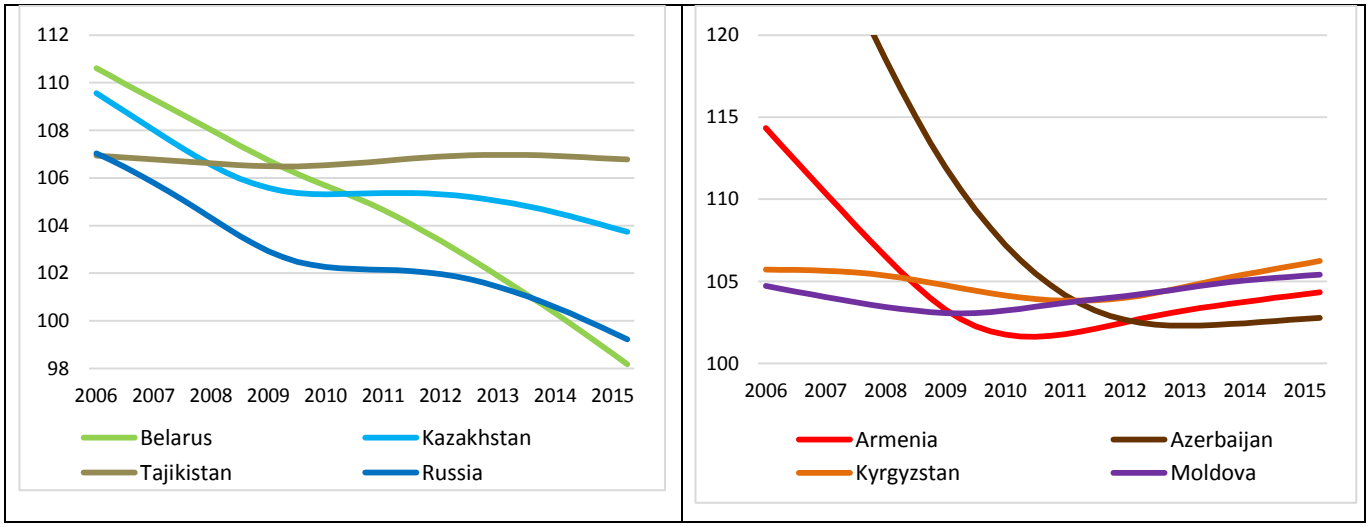
Fig. 6.Tracers of short-term cyclical profiles in the CIS countries'GDP growth

The cyclical dynamics of GDP growth in Belarus, Kazakhstan, Moldova, and Azerbaijan are the most comparable and coherent with the Russian analogue. The macro aggregates short-term cycles in these countries repeated almost concurrently cyclic movement, having fallen into recession. It should be noted that the study's analysis of cyclic interrelation of quarterly GDP growth by countries gives only information about the presence (absence) and strengthening (weakening) of the economic structure convergence and, consequently, reducing cross-country differences in economic indicators and cycles synchronization. Conclusions about the effects of such convergence process should be drawn taking into account the entire set of goals and challenges facing by any cross-country union in the region. For economic policy making in the region, a presence and a level of convergence is essential to assess the degree of integration cooperation and the need for its coordination.

By the end of the analyzed period, a marked decline in the GDP growth was observed in the CIS region against the background of falling oil prices, sanctions on Russia, the strong currency devaluation. There was a threat to deteriorate the balance of payments; the cross-border effects of the Ukrainian economy recession are intensified. This negative trend affected to a greater extent the countries with simultaneous movement of the cyclic profiles in GDP dynamics with the Russian ones.

Among the main economic peculiarities of the country’s convergence in the macro development, which are intensified in the CIS region in recent years, it should be noted the following trends. Labor productivity in most countries remained significantly lower than average across Europe. Despite the global leadership in mining of natural gas, oil, and coal, the region was still mainly focused on the manufacturing production for the final domestic consumption, with low competitiveness in foreign markets. Poor efficiency of economic policies, especially structural and institutional ones, strengthened economic dependence on internal shocks. Poor development of financial instruments and markets for risk diversification, limited access to international capital markets reduced possibilities to implement relevant stabilization policies. At the same time, negative inflation expectations were accumulated. There was a significant deposits outflow and growth of unfavorable assets in the banking sector. Constraints with return of foreign currency loans and components’ imports were intensified; along with low reserves of skilled labor force, it led to business climate deterioration. Drop in world prices for raw materials and energy and reducing revenue from their exports, as well as a strong devaluation pressure on the national currencies – these factors contributed to economic uncertainty rise in the region by the end of 2015.

Figure 7 presents the long-term 15-year trends (as a result of the first pass through Hodrick-Prescott filter) in the GDP growth in the CIS countries, which demonstrate mainly the intensive reduction of long-term paths in the last years of the analyzed period.



Source: Rosstat, CIS STAT, authors' calculations, the Hodrick-Prescott filter (first pass).

Fig. 7. Long-term sustainable profiles (trends) in the GDP growth in Russia and the CIS countries (2005-2015)

Such long-term profiles visualization allows us to assess the following trends in the GDP growth:

- virtually linear trends in Tajikistan;
- the highest intensity of reduction in Russia and Belarus;
- synchronous trend direction in Kazakhstan and Russia;
- almost equal intensity of decline at the end of the analyzed period in Kazakhstan, Azerbaijan, Armenia, Kyrgyzstan, and Moldova.

We propose to determine strong convergence of short-term growth cycle in the GDP growth by a statistically significant cross-correlation coefficient (0.75). Figure8 presents the results of cross-correlation analysis of short-term GDP growth cycles in the CIS region after long-term trends decomposition and short-term gaps smoothing.

All the cross-correlation coefficients are calculated with lags. Synchronous correlation is indicated by 0 lag value, leading – the number of quarters with the sign "-", lagging– the number of quarters with the sign "+".

	Azerbaijan		Armenia		Belarus		Kazakhstan		Kyrgyzstan		Moldova		Tajikistan	
Russia	-2	,770	0	,948	0	,763	-1	,937	2	,156	0	,789	1	,930
Azerbaijan			2	,679	2	,650	1	,804	2	,370	2	,699	2	,642
Armenia					0	,658	-2	,923	2	,240	0	,630	0	,943
Belarus							-2	,764	2	-,149	0	,891	0	,669
Kazakhstan									-2	-,395	1	,702	2	,866
Kyrgyzstan											1	,232	-2	,254
Moldova													0	,665
Tajikistan														

Fig. 8.Cyclic interrelations between countries: cross-correlations of short-term growth cycles in Russia and the CIS countries(2005-2015)

Thus, calculations based on Interstate Statistical Committee of the CIS (CIS STAT) data lead to conclusion about a global slowdown in long-term sustainable profiles in the macroeconomic growth dynamics in the region with the most pronounced decline in Russia and Belarus, as well as a marked volatility of growth cycles in the most CIS countries with a clear predominance of recessionary cyclic events. The high probability of significant secondary effects of the Russian economic recession is confirmed by cross-correlation parameter of convergence. Among these effects it should be noted the decline of money transfer from Russia, which became typical for Moldova, Armenia, and Tajikistan. Reduction of import and export was the most significant for Armenia, Kazakhstan, Belarus, and Moldova. The substantial decrease in imports from Russia occurred in Azerbaijan and Tajikistan. Outflow of foreign direct investment from Russia recorded in Armenia, Belarus, Tajikistan, and Moldova.

At the same time the CIS region is characterized by the absence of common short-term vectors of recession. In particular, the increase in negative tendencies in Belarus was accompanied by decline in investment and consumer demand. Growth deceleration in Kazakhstan was strengthened by significant deterioration of public finances and trade balance. In Moldova banking crisis intensified, and costs of the political cycle increased. The prospects for the countries-exporters of raw materials increasingly deteriorated. Devaluation of the national currency in Kazakhstan increases the risk of slowdown GDP growth in the Asian part of the Commonwealth. The trends previously formed in the countries with the smallest differences in short-term growth cycles mainly dominated in economic activity in the region.

Hence, current growth reduction in the Russian economy does not promote positive prospects in the region. For the countries that export oil, the situation is amplified by price shocks in oil markets. For the countries that import oil, income largely neutralized by domestic market deficiency and intensifying secondary effect of the Russian recession. The chain reaction to the severe

recession in the Russia affected to a greatly extent the economy's contraction in Belarus, Kazakhstan, Azerbaijan and Moldova.

The structural aspect of the CIS macroeconomic development

We analyze the main roots of the current economic developments through measuring national economies' magnitude, industrialization intensity and sectoral structures in the CIS region for the period of 2005-2014.

The gross value added (GVA) structure in general and across the main kinds of economic activities in the CIS countries is presented in the Table 1 of the Appendix.

Tab. 1. Structure of gross value added in Russia and the CIS countries (2005-2014)

	Value added at constant price, million US$			Compound Annual Growth Rate, %					
				2005-2014			2009-2014		
	2005	2009	2014	total	min	max	total	min	max
Russia (in total), including:	1 010 177	1 035 658	676 283	-3,9	-42,2	15,3	-6,9	-42,2	8,6
Agriculture	47 475	47 620	28 002	-5,1	-15,6	10,5	-8,5	-15,6	10,5
Fishing	2 283	2 089	1 136	-6,7	-12,7	13,2	-9,6	-12,7	13,2
Mining and quarrying	121 127	101 234	62 820	-6,4	-10,1	4,7	-7,6	-5,2	4,7
Manufacturing	194 336	166 131	120 050	-4,7	-8,4	4,3	-5,3	-8,4	4,3
Gas, electricity and water production and supply	35 960	31 110	18 310	-6,5	-11,0	2,2	-8,5	-3,7	2,2
Construction	55 590	59 917	36 994	-4,0	-8,5	5,6	-7,7	-8,5	3,7
Retail and wholesale trade	180 211	212 140	138 269	-2,6	-0,9	5,7	-6,9	-0,9	1,6
Services	383 265	415 418	277 139	-3,2	-1,5	2,4	-6,5	-1,5	2,4

Note: Compound Annual Growth Rate (CAGR) is average annual growth rate for a specific period of time; calculated according to the formula: $CAGR = \left(\frac{\text{Value at end of period}}{\text{value at beginning of period}}\right)^{\left(\frac{1}{number of years}\right)}$.

In Russia, we can observe a noticeable increase in GVA contraction for the period of 2009-2014, the most significant – in agriculture and fishing; electricity, gas and water production and supply. Decline of approximately equal intensity revealed in mining and construction, especially by the end of the analyzed period. The compound annual growth rate(CAGR) reduced evenly in trade and services. The greatest decline in manufacturing GVA was recorded in 2009. Negative trends aggravation by the end of the period are largely caused by significant national currency devaluation, which cut down the currency accumulation of the country's GVA, and, at the same time, by the need to convert all statistics into US$ for possibility of countries' benchmarking.

The most significant for the CIS region GVA growth rate (9.6% throughout the entire analyzed period) was recorded in Azerbaijan. The GVA growth in construction, electricity, gas and

water production and distribution, agriculture demonstrated a significant decline in 2009. In mining, conversion the CAGR positive trend in the opposite one (-2.3%) occurred in the last two years. In manufacturing, low but very stable CAGR was registered: 4.1% for the whole period, 4.5% in 2009-2014. The mining sector remained a driver of sustainable national GVA growth; the volume of construction and services significantly increased.

In Armenia, the overall growth rate declined in 2009-2014 with the greatest intensity in services and agriculture. Significant strengthening of negative dynamics was observed in construction (-8.3% in 2009-2014). For manufacturing, the tendency to expand GVA (up to 4.9%) with a very small production volume was the most typical. The country remained the economy of services, trade and agriculture.

Kazakhstan is the largest and growing economy of the region (after Russia), the second core of convergence, with the most sustainable development and national currency stability until 2015. Throughout the analyzed period, the total GVA growth remain stable and moderate (CAGR up to 5.4%). The most impressive increase was recorded in trade, construction, electricity, gas and water production and supply. Manufacturing showed acceleration of growth from 2.2% to 4% in 2009-2014. However, construction demonstrated slowdown in GVA growth. A marked decrease in average values was observed in mining. Today, Kazakhstan's economy can be determined as economy of growing services. Due to large-scale de-industrialization, services GVA significantly exceeded the GVA of mining and manufacturing (56 439 to 40 279 million US$).

In Belarus, along with steady currency devaluation and the GDP potential level diminution, the significant rate of decline intensified by the end of the analyzed period. The greatest GVA reduction in 2009-2014 occurred in the electricity, gas and water production and supply (-19.1%), services (-18.7%), agriculture (-18.3%), and construction (-18, 8%). Despite the sharp decline (more than 3 times), the national GVA is still largely generated by manufacturing and services value added.

The lowest GVA volumes in the analyzed period were recorded in Kyrgyzstan, Tajikistan and Moldova (4142, 6247, and 4068 million US$, respectively). However, for the period of 2009-2014, the overall economic development in Kyrgyzstan and Moldova was characterized by even lower CAGR, while in Tajikistan positive developments began to expand.

In Moldova, mining and agriculture demonstrated the higher growth in 2009-2014; it was accompanied by slight decline in construction, services and trade. At the same time, the negative

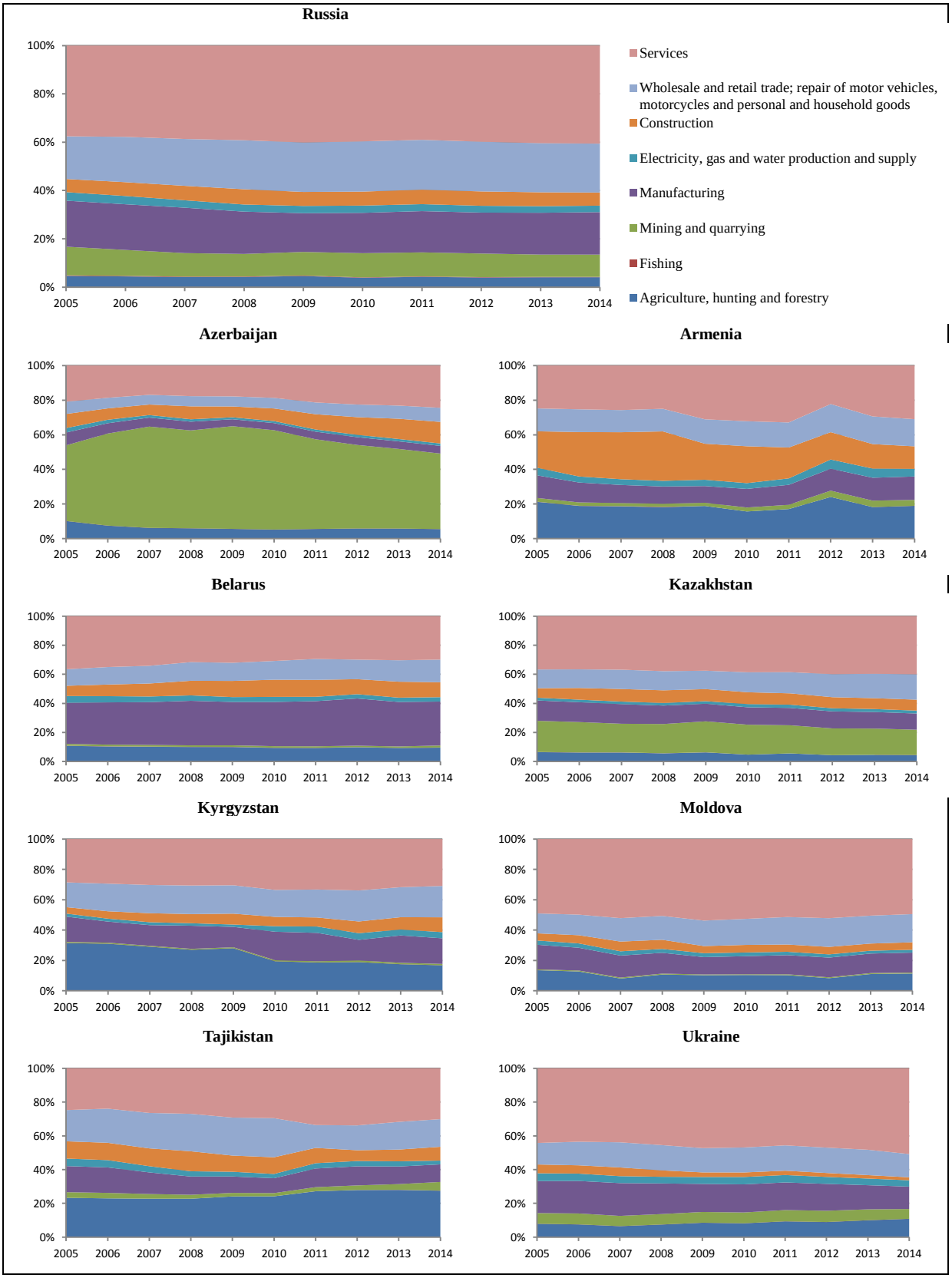
dynamics in manufacturing reversed.

In Kyrgyzstan, agriculture in 2009 showed the highest decrease intensity in the GVA accumulation; since this period growth slowdown in services and trade was observed. Significant average annual expansion of electricity gas and water production and supply was recorded in the 2009-2014; in 2014, manufacturing also demonstrated the rise of GVA growth.

In Tajikistan, the GVA growth was characterized by the high (for the region) rate –over 8%, especially in mining, agriculture and services. The trend of marked rise in the manufacturing GVA (over 9%) emerged after the crisis 2009.

Ukraine was the largest CIS economy (after Russia) up to 2005; the national GVA reached more than 140 million US$. However, after that time, the economic downturn accelerated with about equal intensity over the years, and after the strong currency devaluation in 2014, all the major economic macro parameters significant worsened. The largest GVA contraction was observed in construction (-19%) and manufacturing (-13%); to a lesser extent with respect to other sectors, though rather clearly, decline manifested in agriculture and services.

The structural aspect and dynamics of the main economic activities' contributions to the analyzed countries' GDP are presented in Figure 9.



Source: CIS STAT.

Fig. 9.Structural changes in Russia's and the CIS countries' economic development (2005-2014)

In Russia, the contribution of agriculture, construction, fishing, electricity, gas and water production and supply to national GDP during the analyzed period of 2005-2014 remained low and virtually unchanged. Services and trade provide consistently the largest share of GDP accumulation. Mining contribution to GDP decreased by the end of the period. The negative growth of the manufacturing share was driven by the sharp decline in 2009 and the lack of further recovery.

In Azerbaijan, a country with a strong dependence on raw material, mining contribution to GDP was the greatest, with peak in 2008-2009. Shares of all other economic sectors reduced. By the end of the analyzed period we can observe a noticeable drop in the agriculture and mining importance against the compensation increase of the construction and services contribution. The insignificant share of manufacturing declined further since 2008.

In Armenia, the services value added contribution to GDP remained the most significant and rose over 2005-2014. A notable expansion of agricultural presence in GDP was observed in 2012. The growing participation of trade and substantial reduction of construction were recorded since 2011. Share of mining GVA had the lowest values. Manufacturing contribution developed steadily.

In the Belarus GDP, services and manufacturing GVA dominates consistently. Presence of wholesale and retail trade expanded to some extent since 2009. The shares of agriculture, electricity, gas and water production and supply as well as construction remained rather insignificant.

In Kazakhstan's GDP, mining GVA steadily dominated throughout the period of 2005-2014. Nevertheless, we can observe the contraction of mining and obvious expansion of services and construction contribution since 2009. Shares of agriculture, manufacturing and trade GVA remained the least important to the country's GDP.

For Kyrgyzstan, it was typical some contraction (after a peak in 2012) of agricultural GVA, which is the most significant national sector. At the same time, the services share remained noticeable, and trade fraction in GDP expanded. Mining, electricity, gas and water production and supply were the least important sectors for the country. In addition, it was recorded the successful recovery after crisis of manufacturing GVA.

In Moldova, the services value added steadily made more than half of the national GDP throughout the period of 2005-2014. After 2009, the trade sector expanded constantly. Agriculture almost restored its GDP share after reducing in 2012. Mining, electricity, gas and water production and supply – these sectors were the least significant in country’s GDP in recent years.

In Tajikistan, throughout the period of 2005-2014, the most substantial GDP shares accounted for services and agriculture value added. By the end of the period, the greatest contraction was recorded in the construction contribution dynamics. Pre-crisis share of manufacturing GVA was not restored in 2010-2014, but continued to decline.

More than half of Ukrainian GDP in the analyzed period is made up by services value added. Agriculture and trade sector contributions expanded since 2012. A very small proportion of gross domestic product remains stable. Shares of mining, construction, electricity, gas and water production and supply remained very small during the all analyzed period. Starting in 2012, a significant contraction of manufacturing fraction in the country's GDP was obvious.

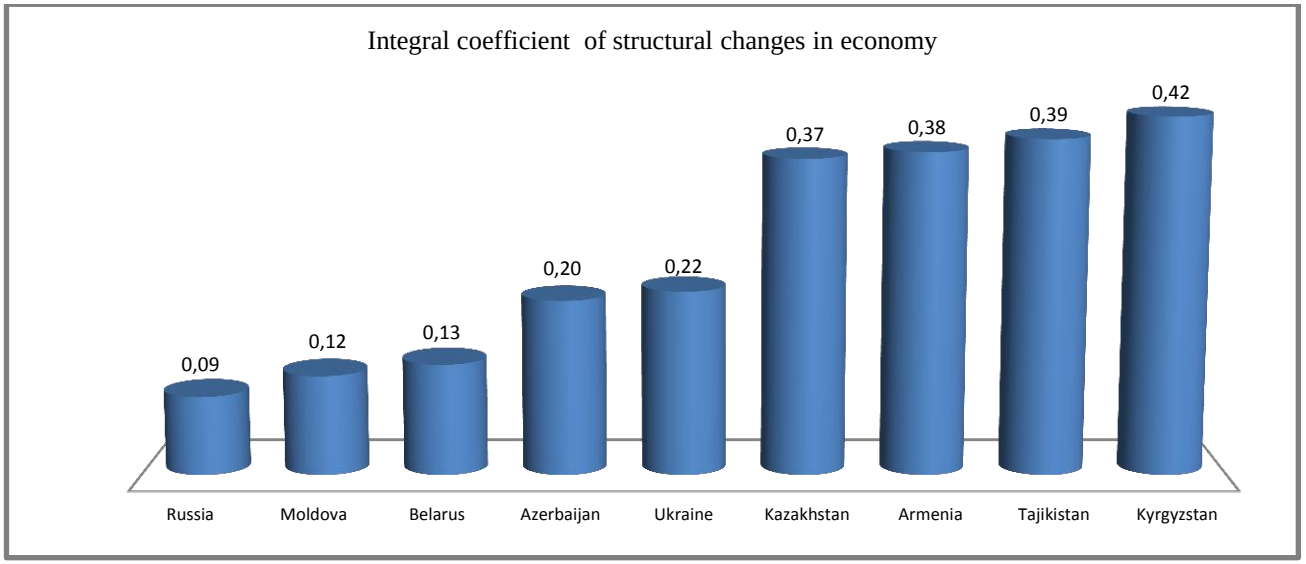
Thus, de-industrialization in the CIS region over the past decade so expanded that almost all countries, except Azerbaijan, were mostly focused on the accumulation of services and trade GVA. The most significant agriculture contribution was identified in Tajikistan, Armenia, and Kyrgyzstan. The highest percentage of mining GVA among of all kinds of economic activities was typical for Kazakhstan and Azerbaijan. Significant share of manufacturing in the national GDP generation can be observed in Russia and Belarus.

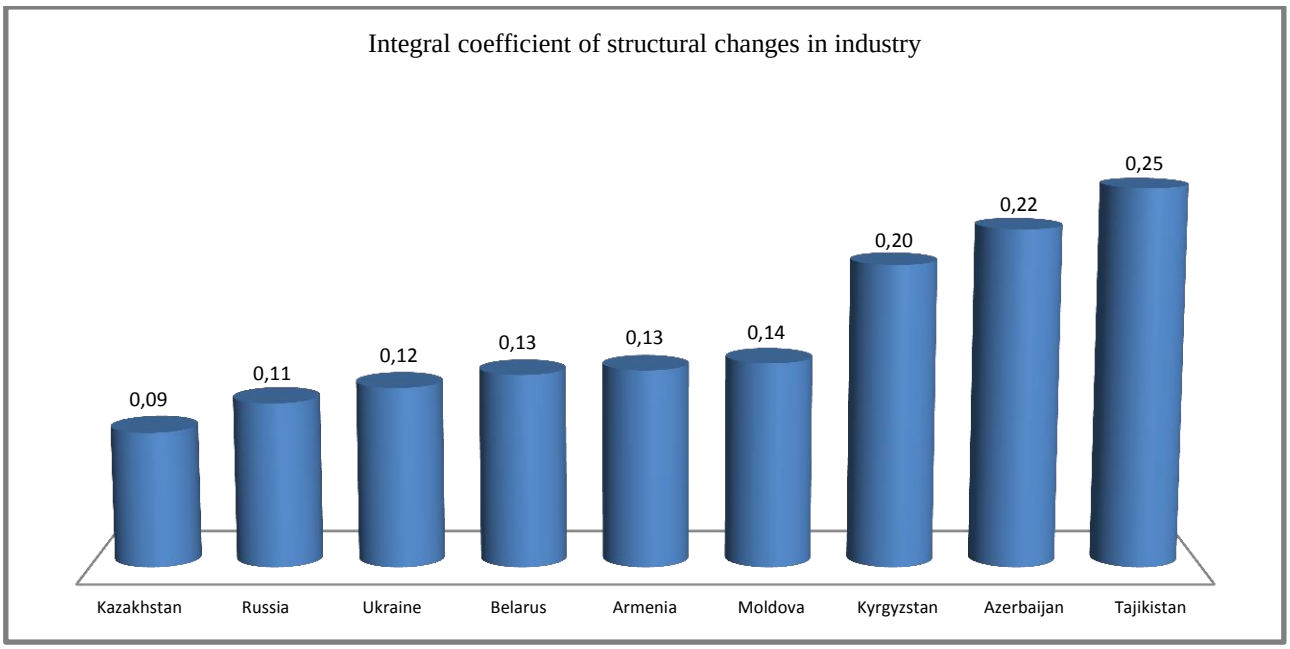
In the study we analyzed the changes in the structure of economic and industrial development of Russia and the CIS countries by calculating the integral coefficient of structural changes:

$$d_{int} = \sqrt{\frac{1}{n}\sum_1^n \left(\frac{S_{i\,2014} - S_{i\,2005}}{S_{i\,2014} + S_{i\,2005}}\right)^2},$$

where S_i^x is a share of i-kind of economic activities value added in the total GVA.

Figure 10 presents the distribution of the structural changes indicator across the CIS countries.





Source: CIS STAT, the authors' calculations.

Fig. 10.The structural changes integral coefficient in economy and industry of Russia and the CIS countries

Analysis of this distribution allows us to note, first of all, that adequate sectoral shifts in the analyzed period of 2005-2014 did not happen in any CIS country. The structure of the economy and industry in Russia remained virtually identical. The highest indicator value was recorded in the Kyrgyzstan economy. Significant structural changes were observed in the economic development of Tajikistan, Armenia, and Kazakhstan. Rather high values of the structural changes indicator in the industrial sector were recorded in Tajikistan, Azerbaijan, and Kyrgyzstan.

An important aspect of the analysis of the structural industrial policy effectiveness is assessment of countries' ability to produce and export manufactured goods by monitoring data on

certain kinds of industrial products in the country's total exports. The Table 2 of the Annex presents the main results of such estimation in percentage for 2005, 2009, and 2014, as well as its absolute changes for the periods of 2005-2014 and 2009-2014 in all CIS countries in the following industrial activities: mining and quarrying; manufacturing; electricity, gas and water production and supply[10]. Such assessments are required for preliminary diagnosis of the export benefits of national industrial activities, the ability of each country to promote the results of their industrial activities to the external market, and these processes development in time.

Thus, for the CIS region in the analyzed period 2005-2014,the following structural sectoral events should be highlighted:

- dominant and upward trend in the mining products export for Russia, Azerbaijan, and Kazakhstan; these countries continue to play the role of raw materials exporters;
- low dynamics of manufacturing contribution to overall exports for Russia and Kazakhstan;
- a decline in the share of manufacturing sector in Armenia, Moldova, Tajikistan, and Ukraine;
- a significant drop in the market share of manufactured exports in Azerbaijan.

Production and export capacities evaluation

One of the most important aspects of the industrial policy quality and relevance analysis is to monitor the level of industrialization, adjusted for population, when efficiency is measured with regard to the countries' size. Table 3 of the Annex shows the main results of value added per capita calculations for certain kinds of industrial activities for each CIS country in 2005-2014 and compound annual growth rates (CAGR) for the periods of 2005-2014 and 2009-2014. First of all, it should be noted that Russia and Belarus were leaders with the highest manufacturing capacities up to 2014.However, these countries demonstrated the most significant for the CIS region changes in positive trends in 2014. Stable increase in manufacturing capacities was observed in Kazakhstan Manufacturing in Tajikistan and Kyrgyzstan functioned with minimal results. Azerbaijan and Kazakhstan remained drivers of mining capacity expansion. The smallest mining volumes per capita among the CIS countries were recorded at the end of the analyzed period in Kyrgyzstan, Moldova, and Belarus. In 2014, Azerbaijan and Kazakhstan with a noticeable advantage constituted the

[10]The export by kind of industrial activities in the analyzed period is authors' evaluation.
The data source: UNCTAD database, URL: http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx.

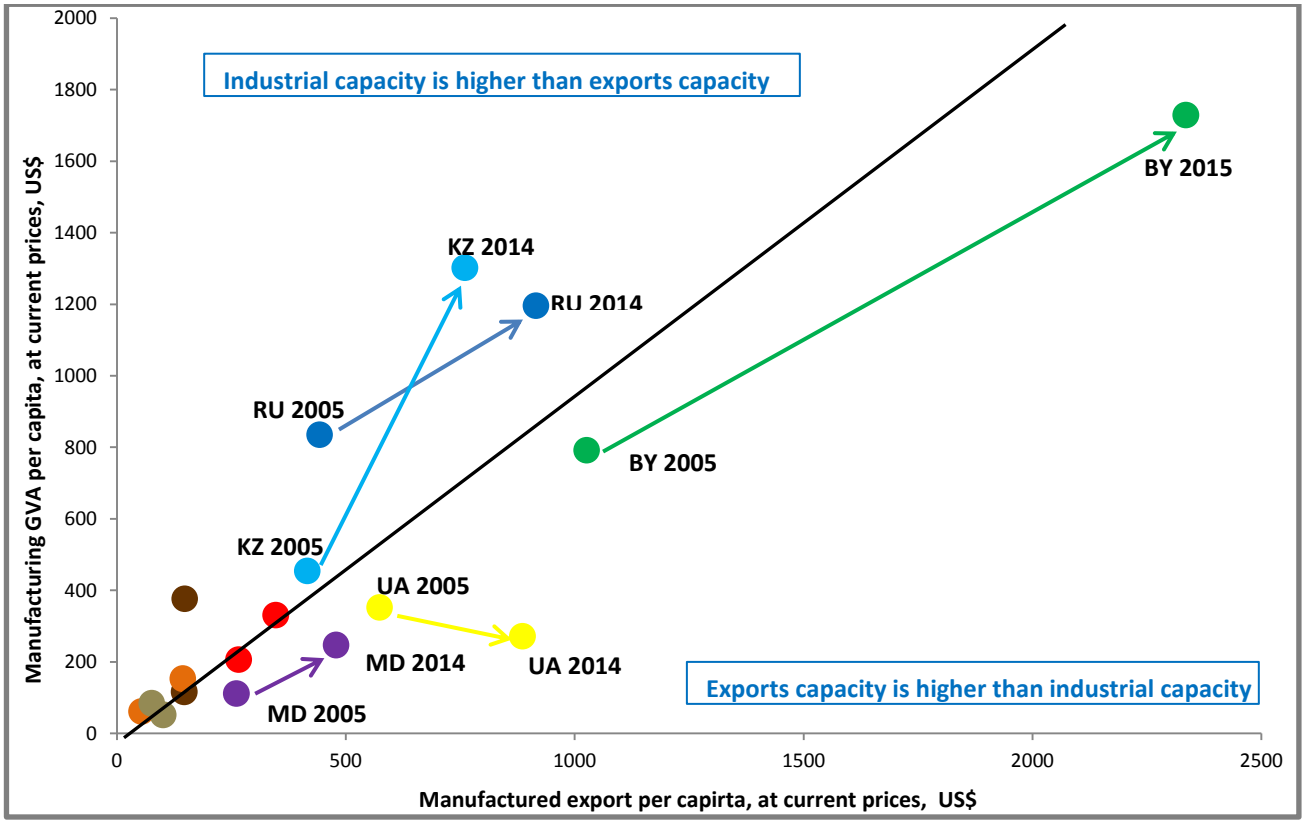
regional core of mining capacities; Russia and Kazakhstan– in manufacturing; Kazakhstan, Russia, and Armenia – in electricity, gas and water production and supply.

To measure the CIS countries integration capacities, realized demand for national industrial products in foreign markets, the competitive ability of certain industrial activities in each country we calculated the industrial exports annual values per capita and CAGR for the period of 2005-2014 and 2009-2014.

Table 4 of the Annex presents the results of export capacity assessment, namely, the annual value of industrial exports per capita (at constant prices, US$) and CAGR (in percentage) for certain kinds of industrial activity for each CIS country over the period of 2005-2014. The main leader of the manufactured export capacity growth in the analyzed period is Belarus (with great advantage), followed by Russia, Ukraine, and Kazakhstan. The lowest volume of manufactured exports per capita was recorded in Tajikistan. Kazakhstan, Azerbaijan, Russia, and Belarus are drivers of intensive growth of raw material export capacities by the end of the analyzed period.

The correspondence between the each CIS country's potential to produce and export manufactured goods in the analyzed period of 2005-2014 is shown in Figure 11[11].

[11] The second graph shows a group of countries, concentrated in the beginning of the first graph coordinate system.



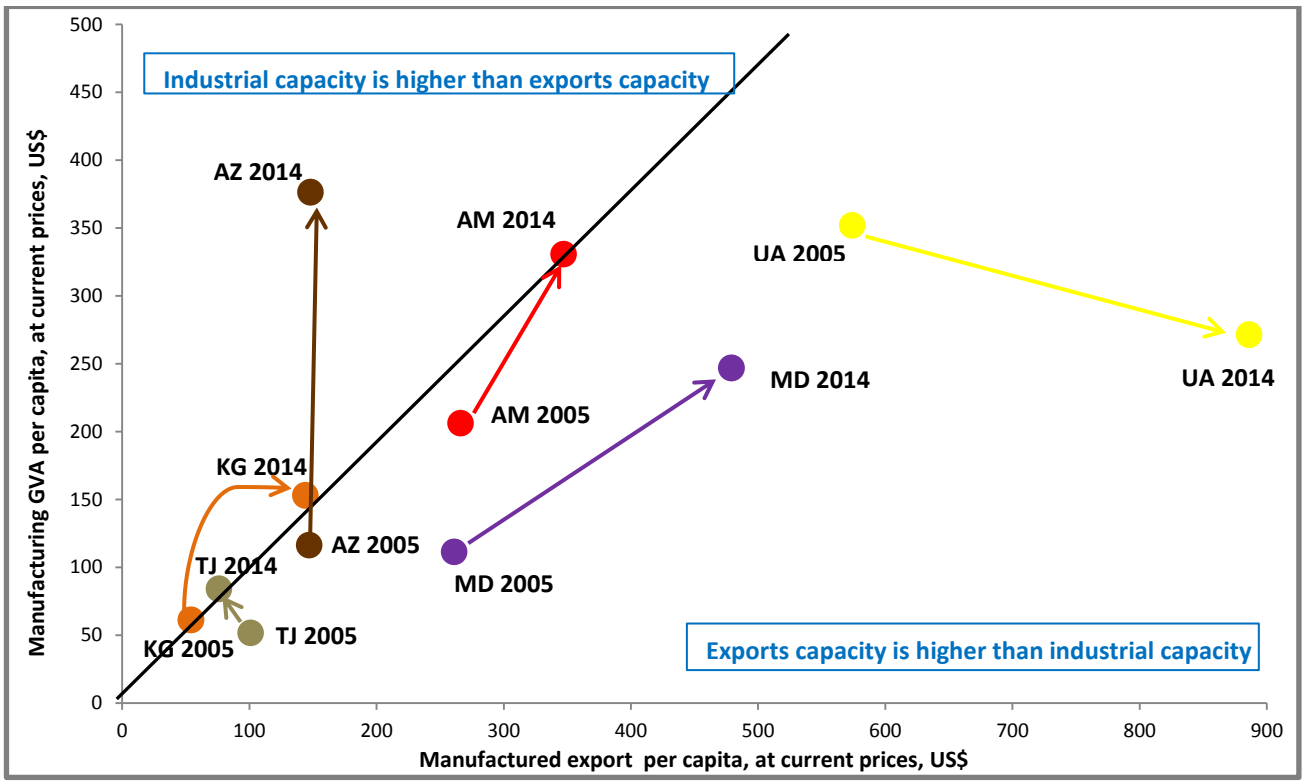


Fig. 11.Industrial production and export capacities in Russia and the CIS countries (2005-2014)

In the figure, the line dividing the quadrant area by 45 degrees defines a perfect balance between production and export capacities, namely, manufacturing value added and manufactured

exports per capita. In the countries above the 45-degree line (in 2014), production capacity exceeded the exports capacity (Russia, Kazakhstan, and Azerbaijan). Approaching the country's position to this line shows the growth of manufacturing competitiveness in foreign markets, improving the business environment outside the country, and – with simultaneous GVA growth – expansion of national wealth (for example, Russia). Removal from this line at high levels of production capacity may indicate, above all, a significant expansion of domestic demand for given products (Kazakhstan, Azerbaijan). At the same time, countries' low levels of production capacity and manufacturing GVA indicate mainly low manufacturing competitiveness, presence of trade barriers, low integration degree, lack of the production capacities for domestic consumption.

In the countries that are below the 45 degrees line, the manufactured export potential exceeds production capacity. At low sectoral GVA level (as a whole and per capita) with increasing export potential, manufacturing largely produces an intermediate product not for domestic consumption, but for final consumption in importing countries. In this case, there is no accumulation of national GVA, manufacturing development and national wealth growth. For countries whose exports capacity significantly exceeds the industrial value added per capita is essential to create effective mechanisms to redirect revenues from foreign economic activity to the real production.

The aspect of the countries' manufacturing impact on the CIS region

The position of each CIS country relative to other countries of the region according to their contribution to the regional manufacturing GVA allows us to determine whether the country is on the core of the region, or is on its periphery. Tables 5 and 6 of Annex and Figure 12 present the distribution and changes in impact of the CIS countries on the overall (regional)manufacturing GVA and manufactured export in 2005-2014.

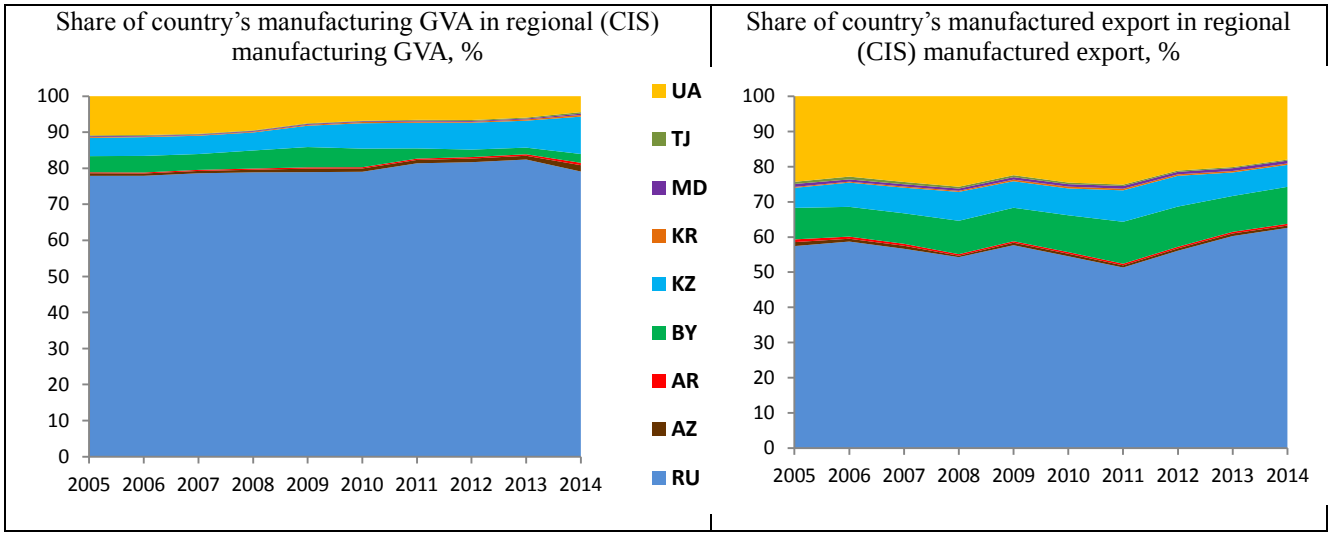
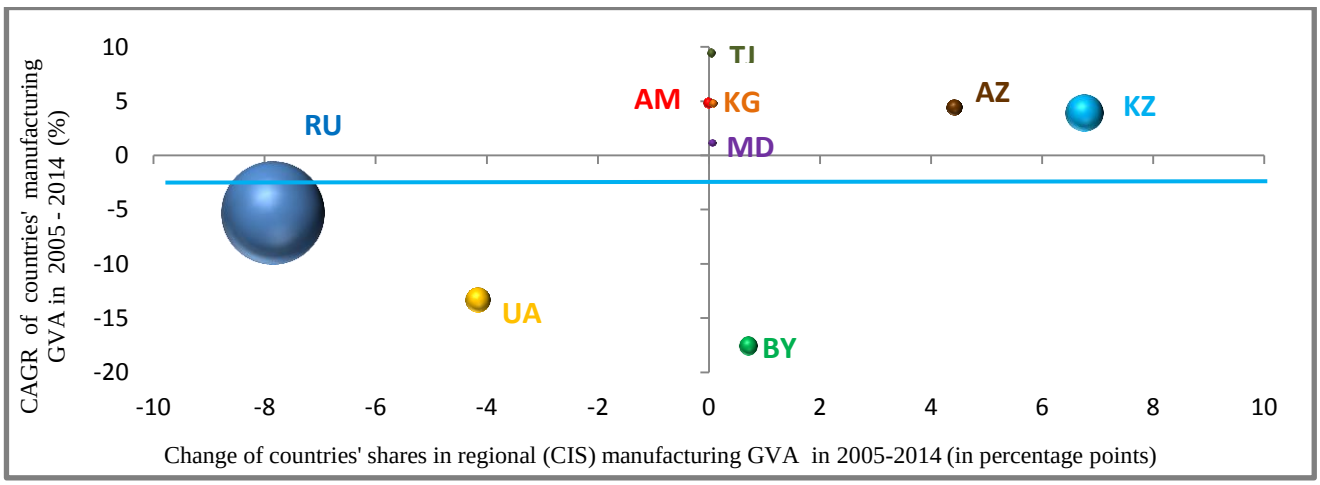
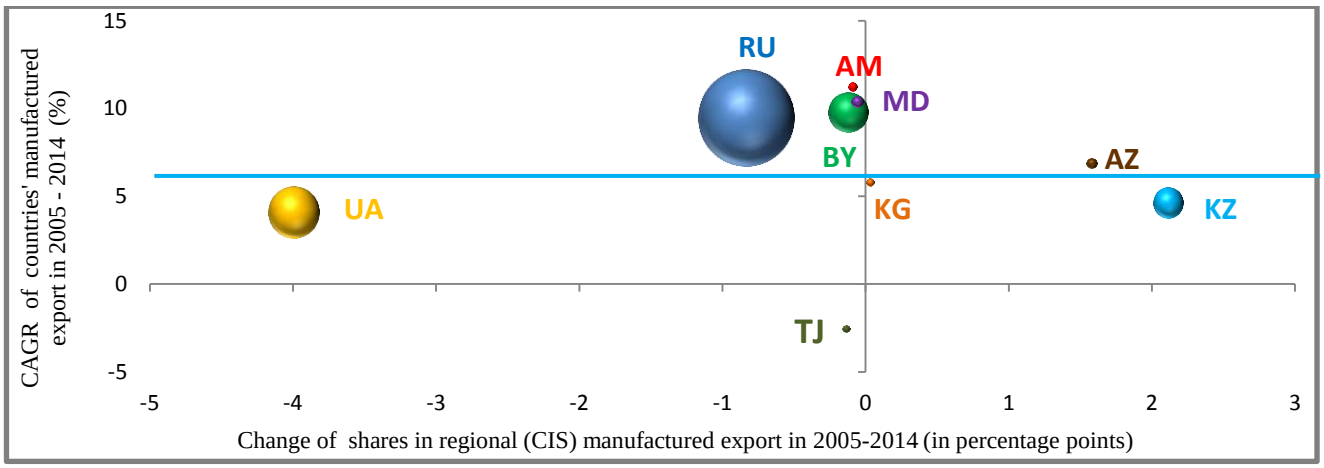


Fig. 12. Impact of the CIS countries on the overall regional manufacturing GVA and manufactured export (2005-2014)

Russia is the country with the greatest impact on both regional GVA and regional exports. While the country's impact on the regional GVA grew steadily since 2005, especially in the period of 2010-2013, and significantly decreased only in 2014, Russian exports share in the total regional manufactured exports expanded randomly and intensively only since 2011. Until 2008, Ukraine was the next economy with regard to its impact on the regional industrial GVA, but the accelerated GVA expansion of Kazakhstan allowed the latter to take a strong position of the second regional leader. Ukraine remains the second largest country in the regional manufactured exports, despite the obvious decline to the end of the analyzed period. Belarus and Kazakhstan retain their export positions at about the same rate. Figure 13 visualizes the interrelations of manufactured export and manufacturing GVA growth in the CIS countries and their impact on the region.





Notes: The bubble size is the volume of countries' manufacturing GVA or manufactured export; the blue line marks the average growth rate of manufacturing GVA or manufactured export in the CIS region.

Fig. 13.Growth and impact of manufacturing GVA and manufactured export in the CIS countries (2005-2014)

To expand country's impact on the regional manufactured exports, improve the competitiveness of their products in foreign markets, the more rapid exports growth, relatively to the regional average, is needed. Accelerate the development of national export capacity comparing to the export growth rates in other countries is an essential condition for improving competitiveness in the region. The large scale for the CIS region Russian industrial exports grew faster than the regional average level, but Russian share in the regional manufacturing GVA decreased considerably during the analyzed period. Kazakhstan became a leader of the export competitiveness intensive growth in the region, in spite of the low volume of manufacturing GVA and exports in the period of 2005-2014.

All of the proposed preliminary dimensions of the national industrial policies effectiveness in the CIS countries are summarized in Table 2. The table presents indicators that reflect changes in countries' capacity, structure and impact and allows us to visualize not only bottlenecks in the industrialization of each country, but the main cross-country interrelations in the regional economic space.

Tab. 2. Assessment of manufacturing effectiveness in Russia and the CIS countries in 2005-2014

	Production indicators				Exports indicators			
	2005	2009	2014	2005-2014, %	2005	2009	2014	2005-2014, %
Russia								
Structure (%)	19,2	16,0	17,8	-1,5	26,4	25,4	26,5	0,1
Capacity (US$)	1354	1163	834	-4,7	443,5	535,8	915,5	7,5
Impact (%)	78,44	74,35	70,58	-7,86	69,94	66,81	69,10	-0,83
Azerbaijan								
Structure (%)	7,4	4,0	4,4	-3,0	16,3	4,5	5,0	-11,3
Capacity (US$)	210	230	280	2,9	146,9	105,5	147,9	0,1
Impact (%)	2,40	5,53	6,81	4,41	2,37	5,05	3,95	1,58
Armenia								
Structure (%)	13,1	9,6	13,5	0,5	91,2	80,6	70,2	-21,0
Capacity (US$)	210	230	329	4,6	265,6	170,0	346,9	2,7
Impact (%)	0,39	0,30	0,37	-0,02	0,30	0,16	0,21	-0,09
Belarus								
Structure (%)	28,3	29,8	30,2	2,0	62,1	59,2	61,3	-0,8
Capacity (US$)	1156	1247	393	-10	1026,5	1327,5	2334,6	8,6
Impact (%)	3,44	3,48	4,15	0,71	5,02	5,13	4,90	-0,12
Kazakhstan								
Structure (%)	14,0	12,1	11,1	-2,8	22,5	23,1	16,7	-5,9
Capacity (US$)	834	774	910	0,9	416,5	621,0	759,8	6,2
Impact (%)	6,23	8,94	12,99	6,76	8,83	10,50	10,95	2,11
Kyrgyzstan								
Structure (%)	16,7	13,4	16,9	0,2	41,8	35,7	51,3	9,5
Capacity (US$)	106	98	120	1,2	54,4	110,9	143,7	10,2
Impact (%)	0,16	0,20	0,23	0,08	0,13	0,18	0,16	0,03
Moldova								
Structure (%)	16,2	11,4	13,2	-3,1	85,5	73,3	72,8	-12,8
Capacity (US$)	165	140	151	-0,9	260,7	263,8	478,7	6,3
Impact (%)	0,17	0,18	0,23	0,06	0,31	0,24	0,25	-0,06
Tajikistan								
Structure (%)	15,5	9,7	10,4	-5,0	76,6	73,6	59,2	-17,4
Capacity (US$)	91	51	79	-1,5	100,8	99,6	75,9	-2,8
Impact (%)	0,19	0,18	0,23	0,04	0,24	0,20	0,11	-0,14
Ukraine								
Structure (%)	19,0	16,6	13,3	-5,7	78,7	75,0	70,4	-8,4
Capacity (US$)	578	345	157	-12,2	574,4	649,2	885,7	4,4
Impact (%)	8,58	6,83	4,41	0,04	10,38	8,50	6,39	-4,00

Source: Rosstat, CIS STAT, authors' calculations, UNIDO recommendations [UNIDO and GIZ, 2015].
Note: structure (%) is the share of manufacturing GVA in the country's GDP(or share of manufactured export in the total country's exports); capacity (US$) is the country's manufacturing GVA (or the country's manufactured export) per capita; impact (%) is the share of country's manufacturing GVA (or manufactured export) in the regional (CIS) manufacturing GVA (of manufactured export).

If to rank all CIS countries using such indicators of industrial and export policies as structure, capacity, and impact on the region, it is possible to obtain the countries distribution according to high, medium and low efficiency, from obvious regional leaders to outsiders.

The countries with high efficient structural policies at the end of the period are Belarus and Kyrgyzstan; with medium efficient– Russia and Kazakhstan; low – Tajikistan, Armenia, Azerbaijan, Moldova and Ukraine.

In accordance with the export and production capacities parameters, the countries with a high efficient (for the region) policies are Kazakhstan and Russia; with medium efficient – Armenia, Belarus, and Azerbaijan; low efficient policies was carried out in Moldova, Kyrgyzstan, and Ukraine.

Among all CIS countries, Russia stands out the strongest impact on the regional industrialization and, therefore, the most effective integration policy. Integration strategies are virtually absent in Kyrgyzstan, Armenia, Moldova, and Tajikistan policies. Export and production policies in Kazakhstan, Belarus, Ukraine, and Azerbaijan can be considered medium efficient in terms of regional convergence.

Conclusions

Comparing all major indicators of economic and industrial development of the CIS countries, it is necessary to take into account the different countries' size, which vastly determines the visible information gaps. The study results showed that in the analyzed period large-scale industrialization has not occurred in any country, largely due to the lack of the national economies structural transformation. The impressive manufacturing growth in some smaller CIS countries did not led, however, to those countries' participation in the highly competitive international processes. Multidirectional trends prevailing in the region today do not allow a clear distinction between countries in terms of their specialization to attribute the homogeneous structures. The region was so engulfed in the premature deindustrialization that almost all countries were united by strong dependence of low national growth on the expansion of services value added under conditions of unstable economic agents'(including households) incomes.

As the main results, we note, in particular:

– The indicators of industrial structure (its level, direction and rate of change, shifting to the manufacturing sector) as well as those of structure and impact in cross-border areas of industrial exports remain the core indicators in industrial policymaking in Russia. Profound structural reforms of the Russian economy are vital for the country. It should be able to provide a sustainable growth of the gross value added (GVA) per capita and exit from the

closed circle of recurring crises (largely caused by the country's dependence on commodity prices) as well as to reduce the negative secondary effects in the CIS economic space. However, over the last decade, such reforms did not happen.

- An appropriate strategy for Azerbaijan, despite the successful increase in industrialization, is a structural transformation of the country’s production and export capacities.
- To overcome the main barriers in the manufacturing sector expansion, Armenia needs to improve exports structure and increase the competitiveness in the regional market.
- Improvement of quality and structure of industrial production and exports, growth of the manufacturing GVA per capita, maintenance of a balance between national industrial and export capacities will contribute to reduce the emerged gaps between the industrial development of Belarus and their regional competitors. A specific recommendation is using high growth rate of manufactured export for expansion of the national wealth.
- The faster growth trend of all generalized industrial indicators in Kazakhstan dominated over the analyzed period at the CIS region. Strengthening positive sectoral developments should be accompanied by relevant changes in the production and exports manufacturing structure in order to expand activities with higher value added.
- The dynamics of the generalized industrial indicators in Kyrgyzstan with regard to the current economic development peculiarities, demonstrates a stabilization of positive trends, but manufacturing GVA per capita does not allow the sector to become a driver of the national GDP expansion.
- The national competence of Moldova within the industrial policy priorities should be to strengthen the production capacities as well as to expand the manufacturing GVA in the national GDP and in the foreign markets.
- Under conditions of prolonged economic growth slowdown and limited budget reserves, the key industrial strategies in Tajikistan should be aimed at strengthening all elements of value added chain in the most significant activities for manufacturing production and export.
- Irrespective of national industrial capacity, Kazakhstan and Azerbaijan should attribute as countries with faster industrialization in the region – their growth rate is not negative and above the regional average. Tajikistan, Kazakhstan, Moldova and Armenia are characterized by moderate industrialization with zero or close to the average in the region growth rate. Passive industrialization with negative and below regional average intensity was typical for Russia and Ukraine. Damped industrialization with slow (almost zero) growth rate and the

maximum distance from the regional average is observed in Belarus.

By the end of the analyzed period 2005-2014, the need for diversification of the national economies and exports and implementation of balanced economic policies only intensified. These policies should support both structural reforms and demand and be aimed to increase productivity, eliminate barriers of manufacturing development and foreign markets access. The current situation in the CIS region largely conjugates with the exacerbating industrial integration barriers. Lack of relevant and strong industrial policy in combination with other factors that strengthen (with different intensity across countries)the national financial and budget vulnerability do not allow the CIS countries to maneuver operatively under the current conditions of high markets volatility as well as enhance the national sustainability to external shocks and the confidence of economic agents.

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ANNEX

Table. 1. Gross Value Added structure in Russia and the CIS countries in 2005-2014

	Value Added, at constant prices (million US$)			Compound Annual Growth Rate (%)					
	2005	2009	2014	2005-2014			2009 - 2014		
				total	min	max	total	min	max
Russia, in total	1 010 177	1 035 658	676 283	-3,9	-42,2	15,3	-6,9	-42,2	8,6
Agriculture, hunting and forestry	47 475	47 620	28 002	-5,1	-15,6	10,5	-8,5	-15,6	10,5
Fishing	2 283	2 089	1 136	-6,7	-12,7	13,2	-9,6	-12,7	13,2
Mining and quarrying	121 127	101 234	62 820	-6,4	-10,1	4,7	-7,6	-5,2	4,7
Manufacturing	194 336	166 131	120 050	-4,7	-8,4	4,3	-5,3	-8,4	4,3
Electricity, gas and water production and supply	35 960	31 110	18 310	-6,5	-11,0	2,2	-8,5	-3,7	2,2
Construction	55 590	59 917	36 994	-4,0	-8,5	5,6	-7,7	-8,5	3,7
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	180 211	212 140	138 269	-2,6	-0,9	5,7	-6,9	-0,9	1,6
Services	383 265	415 418	277 139	-3,2	-1,5	2,4	-6,5	-1,5	2,4
Azerbaijan, in total	24 042	51 155	60 349	9,6	1,1	31,1	2,8	1,1	12,2
Agriculture, hunting and forestry	2 455	2 892	3 347	3,1	-26,0	6,3	2,5	-6,5	6,3
Fishing	0	0	0						
Mining and quarrying	10 501	30 333	26 318	9,6	-9,7	21,7	-2,3	-9,7	4,9
Manufacturing	1 787	2 054	2 671	4,1	-20,4	7,3	4,5	-20,4	7,3
Electricity, gas and water supply	617	579	845	3,2	-27,4	11,8	6,5	-18,6	11,8
Construction	1 956	3 198	7 517	14,4	-19,6	23,2	15,3	-16,4	20,6
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	1 702	2 978	4 914	11,2	-13,5	10,8	8,7	-0,8	10,8
Services	5 024	9 122	14 737	11,4	-10,7	14,2	8,3	0,7	14,2
Armenia, in total	5 175	7 733	7 340	3,6	-25,2	35,9	-0,9	-25,2	5,1
Agriculture, hunting and forestry	1 100	1 460	1 392	2,4	-24,3	40,9	-0,8	-24,3	40,9
Fishing	4,76	0,00	0,00						
Mining and quarrying	111	144	251	8,5	-10,4	48,2	9,7	-8,4	48,2
Manufacturing	676	745	992	3,9	-11,9	11,6	4,9	-3,4	11,6
Electricity, gas and water production and supply	228	282	324	3,6	-20,7	43,2	2,3	-16,8	43,2
Construction	1 089	1 609	955	-1,3	-27,1	21,9	-8,3	-27,1	2,4
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	683	1 091	1 150	5,3	-2,6	12,3	0,9	-1,9	12,3
Services	1 283	2 402	2 275	5,9	-32,4	32,1	-0,9	-32,4	32,1
Belarus, in total.	39 549	39 776	12 336	-11,0	-42,6	11,0	-17,7	-42,6	1,8
Agriculture, hunting and forestry	4 281,6	3 975,2	1 182,2	-12,1	-5,8	4,9	-18,3	-5,8	4,9
Fishing	45,37	50,21	11,28	-13,0	-21,8	11,0	-22,0	-21,8	10,4

	Value Added, at constant prices (million US$)			Compound Annual Growth Rate (%)					
	2005	2009	2014	2005-2014			2009 - 2014		
				total	min	max	total	min	max
Mining and quarrying	486,32	421,15	169,46	-10,0	-7,9	39,1	-14,1	-3,3	39,1
Manufacturing	11 175	11 857	3 727	-10,4	-5,8	4,5	-17,5	-5,8	4,5
Electricity, gas and water production and supply	1 837,6	1 330,3	371,6	-14,8	-14,2	4,4	-19,1	-14,2	4,4
Construction	2 785,3	4 425,0	1 266,4	-7,6	-11,2	13,4	-18,8	-11,2	10,7
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	4 487,3	4 966,6	1 919,6	-8,1	-6,5	11,5	-14,7	-6,5	11,5
Services	14 451	12 751	3 688	-12,8	-7,4	1,6	-18,7	-4,5	1,6
Kazakhstan, in total	90 375	102 824	141 192	4,6	-17,1	36,3	5,4	-17,1	36,3
Agriculture, hunting and forestry	5 849	6 481	6 370	0,9	-24,4	17,7	-0,3	-24,4	17,7
Fishing	81	66	0,0						
Mining and quarrying	19 407	21 891	24 554	2,4	-6,0	5,8	1,9	-6,0	5,8
Manufacturing	12 630	12 455	15 725	2,2	-6,1	0,0	4,0	-4,3	0,0
Electricity, gas and water production and supply	1 714	1 803	2 818	5,1	-7,1	26,5	7,7	-5,9	26,5
Строительство	5 894	8 523	10 606	6,1	-4,7	23,3	3,7	-4,7	0,7
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	11 664	13 033	24 680	7,8	-3,7	8,7	11,2	-3,7	8,7
Services	33 136	38 570	56 439	5,5	-0,8	3,5	6,6	-0,8	3,5
Kyrgyzstan, in total	3 283	3 918	4 142	2,4	-13,6	16,8	0,9	-13,6	9,8
Agriculture, hunting and forestry	1 032	1 098	696	-3,9	-30,6	3,7	-7,3	-30,6	3,7
Fishing	0,09	0,12	0,00						
Mining and quarrying	25	25	37	4,0	-15,5	37,7	6,6	-15,5	37,7
Manufacturing	547	526	699	2,5	-27,5	40,0	4,9	-27,5	40,0
Electricity, gas and water production and supply	66	61	168	9,8	-14,6	134,1	18,5	-10,8	134,1
Construction	138	281	405	11,4	-14,3	29,8	6,3	-14,3	29,8
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	536	733	856	4,8	-5,1	11,4	2,6	-5,1	10,8
Services	938	1 194	1 281	3,2	-6,3	10,1	1,2	-6,3	10,1
Moldova, in total	3 630	4 361	4 068	1,1	-14,2	24,8	-1,2	-14,2	12,4
Agriculture, hunting and forestry	492	447	461	-0,6	-36,6	33,0	0,5	-19,4	33,0
Fishing	1,3	1,9	1,8	3,7	-27,7	27,3	-0,8	-27,7	27,3
Mining and quarrying	19	20	24	2,6	-24,8	20,5	3,2	-24,8	20,5
Manufacturing	590	499	536	-0,9	-16,6	5,9	1,2	-16,6	5,9
Electricity, gas and water production and supply	101	112	76	-2,9	-12,1	2,3	-6,2	-12,1	-0,2
Construction	172	205	201	1,6	-21,8	18,5	-0,3	-21,8	6,1
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal	476	732	755	4,7	-2,7	13,9	0,5	-2,7	6,7

	Value Added, at constant prices (million US$)			Compound Annual Growth Rate (%)					
	2005	2009	2014	2005-2014			2009 - 2014		
				total	min	max	total	min	max
and household goods									
Services	1 779	2 343	2 013	1,2	-3,2	6,1	-2,5	-3,2	6,1
Tajikistan, in total	4 006	3 890	6 247	4,5	-13,8	45,8	8,2	-13,8	45,8
Agriculture, hunting and forestry	933	938	1 718	6,3	-1,6	12,4	10,6	-1,6	12,4
Fishing	0,0	0,0	4,7						
Mining and quarrying	134	82	318	9,0	-15,6	50,4	25,4	-10,3	50,4
Manufacturing	619	378	651	0,5	-15,6	25,2	9,5	-10,3	25,2
Electricity, gas and water production and supply	178	108	140	-2,3	-26,9	25,2	4,4	-26,9	25,2
Construction	410	374	510	2,2	-29,7	17,4	5,3	-29,7	17,4
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	740	876	1 023	3,3	-41,6	11,5	2,6	-41,6	11,5
Services	992	1 135	1 882	6,6	-6,2	13,8	8,8	-6,2	13,8
Ukraine, in total	142 997	95 354	50 692	-9,9	-50,6	8,7	-10,0	-50,6	4,5
Agriculture, hunting and forestry	11 331	8 144	5 504	-7,0	-13,7	14,6	-6,3	-4,4	14,4
Fishing	0	0	0						
Mining and quarrying	9 043	6 072	2 946	-10,6	-9,7	4,3	-11,4	-9,7	4,3
Manufacturing	27 104	15 838	6 717	-13,0	-10,2	1,6	-13,3	-10,2	0,2
Electricity, gas and water production and supply	6 593	3 905	1 910	-11,7	-6,3	6,6	-11,2	-6,3	6,6
Construction	7 461	2 601	880	-19,2	-28,6	5,3	-16,5	-28,6	-1,9
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	18 201	13 707	6 988	-9,1	-8,2	9,7	-10,6	-8,2	3,1
Services	63 265	45 086	25 748	-8,6	-2,6	5,3	-8,9	-2,6	5,3

Note: Compound Annual Growth Rate (CAGR) is average annual growth rate for a specific period of time; calculated according to the formula: $\text{CAGR} = \left(\frac{\text{Value at end of period}}{\text{value at beginning of period}}\right)^{\left(\frac{1}{\text{number of years}}\right)}$

Tab. 2. Structural changes in economic development of Russia and the CIS countries in 2005-2014

	Industry share in total exports (%)			Changes (in percentage points)					
				2005-2014			2009 - 2014		
	2005	2009	2014	total	min	max	total	min	max
Mining and quarrying									
Russia	63,1	63,6	70,7	7,5	-3,3	4,4	7,1	-3,3	3,3
Azerbaijan	79,1	91,8	92,8	13,7	-3,6	10,3	1,0	-3,6	2,3
Armenia	5,0	14,5	22,7	17,8	-2,9	7,4	8,2	-2,9	5,0
Belarus	35,1	37,8	33,8	-1,3	-9,7	7,3	-4,0	-9,7	7,3
Kazakhstan	75,6	74,9	81,3	5,7	-3,2	5,0	6,4	-3,2	5,0
Kyrgyzstan	15,1	4,5	15,6	0,5	-19,4	12,6	11,2	-3,1	12,6
Moldova	2,0	1,3	2,2	0,2	-2,5	2,1	0,9	-2,5	1,8
Tajikistan	0,8	4,4	8,5	7,7	-1,8	3,9	4,1	-1,8	3,9
Ukraine	14,7	10,7	11,8	-2,9	-4,4	3,3	1,1	-4,4	3,3
Manufacturing									
Russia	26,4	25,4	26,5	0,1	-3,8	5,4	1,1	-3,2	5,4
Azerbaijan	16,3	4,5	5,0	-11,3	-7,9	1,8	0,5	-0,7	1,8
Armenia	91,2	80,6	70,2	-21,0	-7,3	3,6	-10,5	-7,3	3,6
Belarus	62,1	59,2	61,3	-0,8	-8,2	7,6	2,1	-8,2	7,6
Kazakhstan	22,5	23,1	16,7	-5,9	-4,8	2,0	-6,4	-4,8	2,0
Kyrgyzstan	41,8	35,7	51,3	9,5	-10,4	11,8	15,6	-3,3	11,8
Moldova	85,5	73,3	72,8	-12,8	-10,4	6,7	-0,5	-10,4	6,7
Tajikistan	76,6	73,6	59,2	-17,4	-11,1	2,9	-14,5	-11,1	1,8
Ukraine	78,7	75,0	70,4	-8,4	-6,0	3,5	-4,7	-4,5	1,9
Electricity, gas and water production and supply									
Russia	0,23	0,22	0,15	-0,08	-0,07	0,06	-0,07	-0,04	0,03
Azerbaijan	0,44	0,18	0,11	-0,33	-0,21	0,11	-0,07	-0,12	0,11
Armenia	2,3	0,5	4,0	1,6	-1,6	3,5	3,4	-1,6	3,5
Belarus	0,13	0,00	0,10	-0,03	-0,11	0,08	0,10	-0,11	0,08
Kazakhstan	0,14	0,09	0,14	0,00	-0,08	0,07	0,05	-0,08	0,07
Kyrgyzstan	3,9	3,8	3,2	-0,7	-2,9	3,4	-0,6	-2,9	3,4
Moldova	0,0	0,9	0,0	0,0	-0,7	1,1	-0,9	-0,7	0,1
Tajikistan	6,7	4,0	2,3	-4,4	-2,9	0,8	-1,7	-2,9	0,8

Tab. 3.The industrial capacity in Russia and the CIS countries in 2005 - 2014

	Industrial Value Added per capita (at constant prices, US$)			Compound Annual Growth Rate (%)					
	2005	2009	2014	2005-2014			2009 - 2014		
				total	min	max	total	min	max
Mining and quarrying									
Russia	844	709	436	-6,4	-42,4	11,2	-7,8	-42,4	11,2
Azerbaijan	1235	3390	2760	8,4	-9,9	50,7	-3,4	-9,9	16,3
Armenia	34,6	44,3	83,3	9,2	-20,9	58,6	11,1	-20,9	58,6
Belarus	50,3	44,3	17,9	-9,8	-44,1	15,6	-14,0	-44,1	15,6
Kazakhstan	1281	1360	1420	1,0	-17,5	29,9	0,7	-17,5	29,9
Kyrgyzstan	4,8	4,7	6,3	2,7	-18,7	32,8	5,2	-18,7	32,8
Moldova	5,2	5,6	6,8	2,7	-34,1	35,5	3,2	-34,1	35,5
Tajikistan	19,8	11,1	38,5	6,9	-24,3	77,9	23,0	-24,3	77,9
Ukraine	193	132	69	-9,8	-52,8	11,6	-10,3	-52,8	9,4
Manufacturing									
Russia	1354	1163	834	-4,7	-41,3	14,5	-5,4	-41,3	13,3
Azerbaijan	210	230	280	2,9	-11,8	13,2	3,4	-11,8	7,1
Armenia	210	230	329	4,6	-28,0	23,4	6,2	-28,0	17,6
Belarus	1156	1247	393	-10,2	-41,3	15,1	-17,5	-41,3	3,9
Kazakhstan	834	774	910	0,9	-22,3	32,7	2,7	-22,3	32,7
Kyrgyzstan	106	98	120	1,2	-30,1	52,0	3,5	-30,1	52,0
Moldova	165	140	151	-0,9	-26,9	19,1	1,3	-26,9	19,1
Tajikistan	91	51	79	-1,5	-24,3	77,9	7,4	-24,3	77,9
Ukraine	578	345	157	-12,2	-51,6	10,8	-12,3	-51,6	3,1
Electricity, gas and water production and supply									
Russia	250,6	217,9	127,2	-6,6	-42,8	9,1	-8,6	-42,8	8,5
Azerbaijan	72,6	64,7	88,6	2,0	-9,7	11,6	5,4	-9,7	11,6
Armenia	70,8	86,9	107,3	4,3	-23,5	53,2	3,6	-23,5	53,2
Belarus	190,1	139,9	39,2	-14,6	-50,7	6,5	-19,1	-50,7	6,5
Kazakhstan	113,1	112,0	163,0	3,7	-20,9	69,9	6,4	-20,9	69,9
Kyrgyzstan	12,8	11,3	28,9	8,5	-18,0	154,1	17,0	-18,0	154,1
Moldova	28,3	31,3	21,3	-2,8	-14,6	13,8	-6,2	-14,6	1,9
Tajikistan	26,2	14,8	17,0	-4,3	-30,1	77,9	2,3	-30,1	77,9
Ukraine	140,5	85,1	44,6	-10,8	-49,9	9,5	-10,2	-49,9	9,5

Tab. 4. The industrial exports capacity in Russia and the CIS countries in 2005 - 2014

	Industrial exports per capita (at current prices, US$)			Compound Annual Growth Rate (%)					
				2005-2014			2009 - 2014		
	2005	2009	2014	total	min	max	total	min	max
Mining and quarrying									
Russia	1062,0	1344,5	2443,1	8,7	-38,7	42,3	10,5	-38,7	37,3
Azerbaijan	711,4	2164,9	2749,6	14,5	-34,4	89,8	4,1	-34,4	31,7
Armenia	14,4	30,7	112,5	22,8	-17,4	166,3	24,2	-17,4	97,8
Belarus	580,6	846,9	1286,0	8,3	-33,6	106,8	7,2	-33,6	106,8
Kazakhstan	1396,1	2016,2	3707,4	10,3	-40,1	55,3	10,7	-40,1	55,3
Kyrgyzstan	19,7	13,9	43,8	8,3	-60,8	295,2	21,0	-47,5	295,2
Moldova	6,2	4,8	14,8	9,1	-72,0	182,9	20,7	-72,0	182,9
Tajikistan	1,1	5,9	10,9	26,0	-21,1	116,5	10,7	-21,1	116,5
Ukraine	107,3	92,4	148,6	3,3	-41,9	69,9	8,2	-41,9	69,9
Manufacturing									
Russia	443,5	535,8	915,5	7,5	-32,0	28,2	9,3	-32,0	28,2
Azerbaijan	146,9	105,5	147,9	0,1	-45,2	35,3	5,8	-16,9	28,2
Armenia	265,6	170,0	346,9	2,7	-39,1	34,1	12,6	-39,1	34,1
Belarus	1026,5	1327,5	2334,6	8,6	-35,6	43,9	9,9	-35,6	43,9
Kazakhstan	416,5	621,0	759,8	6,2	-42,3	49,0	3,4	-42,3	45,7
Kyrgyzstan	54,4	110,9	143,7	10,2	-15,2	52,0	4,4	-15,2	38,0
Moldova	260,7	263,8	478,7	6,3	-29,3	39,8	10,4	-29,3	39,8
Tajikistan	100,8	99,6	75,9	-2,8	-33,1	56,8	-4,4	-33,1	8,7
Ukraine	574,4	649,2	885,7	4,4	-43,8	34,5	5,3	-43,8	33,5
Electricity, gas and water production and supply									
Russia	3,8	4,6	5,1	2,9	-33,2	82,1	1,7	-33,2	52,0
Azerbaijan	3,9	4,1	3,2	-2,2	-63,5	216,3	-4,4	-63,5	216,3
Armenia	6,8	1,1	19,6	11,2	-56,6	804,8	61,0	-20,3	804,8
Belarus	2,2	0,05	3,9	6,0	-43,3	82,3	109,8	-43,3	82,3
Kazakhstan	2,7	2,5	6,6	9,5	-78,1	231,5	17,3	-78,1	231,5
Kyrgyzstan	5,1	11,7	8,9	5,8	-63,5	111,7	-4,5	-63,5	111,7
Moldova	0,1	3,1	0,0	-33,0	-84,9	77,3	-70,0	-84,9	77,3
Tajikistan	8,8	5,4	3,0	-10,3	-69,0	84,2	-9,4	-69,0	84,2
Ukraine	3,8	5,0	11,3	11,6	-50,9	115,7	14,6	-50,9	115,7

Tab. 5.The impact of Russia and CIS countries on the total manufacturing GVA of the CIS region in 2005-2014

	Share in the CIS region manufacturing GVA (%)			Changes (in percentage points)					
				2005-2014			2009 - 2014		
	2005	2009	2014	total	min	max	total	min	max
Russia	78,4	74,4	70,6	-7,857	-0,056	0,015	-3,774	-0,056	0,015
Azerbaijan	2,4	5,5	6,8	4,410	-0,003	0,018	1,279	-0,003	0,018
Armenia	0,4	0,3	0,4	-0,021	-0,001	0,001	0,073	0,000	0,001
Belarus	3,4	3,5	4,1	0,708	-0,005	0,013	0,670	-0,005	0,013
Kazakhstan	6,2	8,9	13,0	6,760	-0,005	0,033	4,047	-0,005	0,033
Kyrgyzstan	0,2	0,2	0,2	0,077	-0,001	0,001	0,030	-0,001	0,001
Moldova	0,2	0,2	0,2	0,057	0,000	0,001	0,046	0,000	0,001
Tajikistan	0,2	0,2	0,2	0,036	0,000	0,001	0,048	0,000	0,001
Ukraine	8,6	6,8	4,4	-4,169	-0,014	0,003	-2,419	-0,014	0,002

Tab. 6.The impact of Russia and CIS countries on the total manufacturing exports of the CIS region in 2005-2014

	Share in the CIS region manufactured exports (%)			Changes (in percentage points)					
				2005-2014			2009 - 2014		
	2005	2009	2014	total	min	max	total	min	max
Russia	69,9	66,8	69,1	-0,833	-0,026	0,020	2,294	-0,026	0,020
Azerbaijan	2,4	5,1	3,9	1,580	-0,006	0,011	-1,106	-0,006	0,004
Armenia	0,3	0,2	0,2	-0,092	-0,001	0,000	0,043	0,000	0,000
Belarus	5,0	5,1	4,9	-0,122	-0,010	0,009	-0,232	-0,010	0,009
Kazakhstan	8,8	10,5	10,9	2,114	-0,007	0,016	0,441	-0,007	0,016
Kyrgyzstan	0,1	0,2	0,2	0,032	-0,001	0,001	-0,019	0,000	0,001
Moldova	0,3	0,2	0,3	-0,058	-0,001	0,000	0,010	0,000	0,000
Tajikistan	0,2	0,2	0,1	-0,137	-0,001	0,001	-0,096	0,000	0,000
Ukraine	10,4	8,5	6,4	-3,995	-0,013	0,008	-2,111	-0,011	0,005

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