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INDUSTRIAL DEVELOPMENT IN THE CIS: RE-INDUSTRIALIZATION TRENDS AND POTENTIAL

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Industrial development in the CIS: Re-industrialization trends and potential

Liudmila Kitrar and Shyam Upadhyaya
Statistics Division
UNIDO

Georgy Ostapkovich
National Research University Higher School of Economics

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

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ABSTRACT

UNIDO promotes the implementation of inclusive and sustainable industrial development (ISID) within the framework of the Sustainable Development Goals (SDG) by acting as a global forum for the establishment of relevant international standards, including industrial statistics. In this context, UNIDO is implementing a regional project "Improvement of industrial statistics and development of indicators of industrial performance for policy-relevant analysis in CIS countries". The project's main objective is to provide methodological assistance to national statistical offices in the Commonwealth of Independent States (CIS) by introducing international standards on industrial statistics to statistical practices and compiling modern and internationally comparable statistical information to display industrial development processes. To do so, the reliability, timeliness and international comparability of the official statistics of Rosstat and other national statistical offices of CIS countries were assessed, i.e. the analytical part of the project was based primarily on official data sources. This paper presents the intermediate results of the statistical analysis of the UNIDO project's analytical module[1].

Keywords: manufacturing, integration, industrial policy, structure, production capacity, export capacity, technological upgrading, diversification, employment, industrial greening

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

[1] Some assessments of manufacturing activities in Russia were obtained within the framework of the Basic Research Program at the National Research University Higher School of Economics (HSE) and supported within the framework of the Russian Academic Excellence Project '5-100'.

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1. Introduction

UNIDO has developed the concept of Inclusive and Sustainable Industrial Development (ISID) [UNIDO, 2014], as enshrined in the Lima Declaration [UNIDO, 2013a], to achieve the Sustainable Development Goals (SDG) [UN, 2015] and foster countries' prosperity. ISID has become a key strategy in global development since 2015. It promotes sustainable economic growth, creates higher skill jobs, builds equitable societies, protects the environment, and generates inclusive and sustainable globalization. ISID is a key driver of successful integration of economic, social and environmental factors which are necessary for achieving sustainable development through the creation and improvement of countries' industrial capacities. This is a priority area of UNIDO's current activity, acting as a global forum for industrial development and fostering the establishment of international standards, including on industrial statistics.

In this context, UNIDO has launched the regional project "Improvement of the industrial statistics and the development of statistical indicators for the analysis of industrial development in the CIS countries". The project provides methodological assistance to national statistical offices in implementing international standards on industrial statistics into practice, and in producing timely, internationally comparable and reliable information on industrial development.

This paper presents the main results of the statistical analyses and trends in manufacturing development in Russia and other CIS countries in terms of integration performance, effectiveness of industrial policies and growth of competitiveness. The study's relevance is based on the fact that every country should be able to carry out international comparisons to measure the level and dynamics of national industry indicators relative to the data of both cross-border and strategically important countries.

To determine the performance of national industrial policies, available and comparable statistical indicators are selected and categorized in order to evaluate them and present them graphically in tables as cross-country comparisons.

2. Literature review

The profound technological changes that have taken place in all economic activities and the rapid emergence of new competitive advantages have contributed to the modernization of industrial landscapes in all CIS countries, irrespective of their level of income and development. National economies should be able to engage in the global flow of goods and maximize their gains from all productivity factors. They should aim to fully realize the productive capacities of new technologies. To benefit from global value chains—at least at the given pace of integration—countries need to sustainably develop such competitive factors as natural resources and the labour force. It is crucial to expand technological and organizational skills, implement fast and cheap means of communication, the available infrastructure, training programmes and to foster investment [UNIDO, 2015a; UN, 2015; Gohberg et al., 2013; Simachev et al., 2014; Meissner et al., 2013; Mironov, 2014; Ivanter et al., 2013; Kravchenko, 2015].

The long-term trends in the dynamics of countries' cross-border interactions, especially in the context of developing competitive industrial activities, are an important element in national economic monitoring. Integration and cooperation in innovative industrial activities can provide a strong multiplier effect on other economic sectors in the CIS [Vinokurov and Libman, 2012; Vinokurov et al., 2015; Eurasian Development Bank, 2015a, 2015b]. Industries dependent on import substitutions from third countries to produce goods of a comparable quality can learn from the specialization of those countries that are more integrated [Fedorov, 2014; Panteleyev et al., 2015; Eurasian Development Bank, 2014].

The current economic development in the CIS region is characterized by deepening uncertainty about the main integration strategies. This is largely attributable to a decline in world oil prices, the transformation of the oil market's structure, the monetary policies of reserve currency issuers, currency devaluation in CIS countries and business activity slowdown [CB RF, 2014a, 2014b, 2015a, 2015b; Gaidar Institute, 2015; Analytical Center, 2015; IMF, 2015, 2016; Bems et al., 2016; CBTS ISSEK HSE, 2014-2016a, b].

The success of industrial policies aimed primarily at extending high value added sectors and increasing factor productivity largely depends on structural changes in the national economy, on the ability to create new and fast-growing activities and to implement innovations [Shuyskiy, 2014; Kuznetsov et al., 2014; Sukharev, 2014; Minobrnauki, 2014]. In this regard, there is an urgent need to create a "punch list" of technological competences, which should include a broad set of indicators in as many industrial activities, processes and functions as possible. The

necessary coordination between national and international actors of such integration can thereby be achieved.

To develop a relevant industrial strategy, the size of the national industry and its position in the global and regional economic area, the ability to produce and export competitive manufacturing products, the industrial and export capacities in comparison with peer or benchmark countries need to be assessed. Hence, the main objective of this analytical study is to identify the main trends in the manufacturing development of Russia and other CIS countries in terms of their integration performance, industrial policy effectiveness and growth of competitiveness. In this context, we have formulated the key research questions of the study as follows: resource-based growth or innovative manufacturing development; shrinking production space or accelerating the re-industrialization process; interpenetration or strengthening of the borders? The study will also evaluate whether favourable opportunities for intensive growth periods in the development of the national economies have been fully realized to build competitive re-industrialization potential in the CIS region since 2005.

3. Analysis methods and data set

The proposed approach is used to evaluate the trajectories of both economic and industrial development in the CIS region for the period 2005-2014. It is mainly based on the toolbox "EQuIP – Enhancing the Quality of Industrial Policies" developed by UNIDO and the German Development Cooperation through the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH [UNIDO and GIZ, 2015]. This toolbox was designed to estimate inclusive economic growth and to calculate the Competitive Industrial Performance index; and has been successfully applied to analyse national re-industrialization processes [UNIDO, 2015; Government of Nepal and UNIDO, 2014; Government of URT and UNIDO, 2012].

Preliminary evaluations of re-industrialization processes in the integrated countries, in particular, in terms of cross-border social and economic interests are carried out within the framework of the relative performance of industrial policies. The sequence of measurement procedures and visualizations of assessments are available to users at all levels of management and decision-making.

The proposed research method entails an extensive sequence of steps that will provide a general overview of the growth dynamics and structure of national economies, the positions and size of their industrial sectors, the intensity and changes in the impact of industry in each country and on CIS integration. Furthermore, phases of successful industrialization—both for a specific country and for CIS integration as a whole—which are characterized by sustainable growth over a long period of time, are identified.

The following factors are evaluated for every country:

- Macroeconomic development and convergence of economic cycles;
- Gross value added (GVA); level of industrialization and sectoral distributions;
- Structural changes in economic and industrial development;
- Capacities to produce and export basic industrial products;
- Manufacturing contributions to total GVA in the CIS region;
- Interrelation of growth and impact of manufacturing value added (MVA) and exports;
- Summarizing indicators of manufacturing performance in CIS integration.

We used a two-pronged approach to monitor structural changes. First, we analysed the shares of all economic sectors in GDP in all CIS countries during the reference period from the standpoint of "positive economics". We derived a common basic model of structural changes without taking the homogeneity of the observed economies into account by averaging such data. We then examined the shifts of sectoral shares in GDP according to the countries' population and level of national income per capita. The second stage of monitoring entailed measuring the link between countries' economic growth and structural shifts (as changes in MVA shares in GDP) from 2005-2014. The analysis is based on so-called "normative economics" and allows assessment of structural changes taking place in various industrial activities – the main driver of sustainable economic growth in the CIS region [UN, 2006].

Other major methodological features of the study include:

- Primarily using official statistics of all countries analysed, and which are comparable and regularly published by a recognized international organization(s) in the region;
- Only using legitimate international data sources and classifications for cross-country comparisons, which provides relevant evaluations of heterogeneous samples;
- Combining macroeconomic and sectoral/industry dynamics to assess trends and levels up to the 2-digit level of national classifications in line with the International Standard Industrial Classification of All Economic Activities.

The research methods used in this study combine basic methods of analytical studies: economic diagnosis, tabular and graphical methods of data interpretation, structural and dynamic statistical analysis. We used the software "Statistica" and "EViews" to process statistical data and apply mathematical and statistical methods.

We used the UNIDO database INDSTAT2 [UNIDO, 2016], the Russian Federation Federal State Statistics Services database [Rosstat 2016], the CIS Statistical Committee database [CIS STAT, 2016] and the United Nations Conference on trade and development database UNCTADstat [UNCTAD, 2016a] as our data sources to assess manufacturing development in the CIS countries in the period 2005-2014. We thus derive information on the main indicators of economic development in nine CIS countries, including those that characterize up to 24 aggregated manufacturing activities at the two-digit level of ISIC, Rev. 3.1 [UN, 2005] from 2005-2014. We classified exported goods (255 individual products) into types of activities similar to the industrial classification. The selected activities are typical representatives of all industrial groups that play an important role in the CIS region, with different technology

contents and capital and labour intensities in resource-based, low-tech, medium- and high-tech industries.

The period analysed (2005-2014) is our reference period for economic dynamics, covering a full business cycle from the onset of a deep recession (2008-2009) to another (2014). The focus of our research is manufacturing sectors in Russia (RU) and other CIS countries, namely Azerbaijan (AZ), Armenia (AM), Belarus (BY), Kazakhstan (KZ), Kyrgyzstan (KG), Moldova (MD), Tajikistan (TJ) and Ukraine (UA).

To carry out all necessary measurements, the annual statistical data of the CIS countries for the period 2005-2014 was converted into a comparable currency, US dollars ($), based on the average annual rate of the national currencies.

4. The main trends in CIS countries' economic development

4.1. Convergence

Accelerating "conditional" convergence in the CIS does not necessarily mean closing the gaps between national economic capacities and between the intensity of their changes, but rather a convergence of the short-term growth cycles within the common dynamics of the GDP in CIS countries. The strongest correlation over the decade, accounting for more than 90 per cent of the variation in the time series, was observed in the short-term growth of GDP in Russia, Kazakhstan, Armenia and Tajikistan [Upadhyaya et al., 2016].

In 2014, the GDP of nine CIS countries accounted for 3.0 per cent of global GDP only; this increased the region's divergence with the rest of the world. The share of Russia's GDP in total GDP of the CIS region fell by 1.8 per cent between 2005 and 2014 to 77.8 per cent (US$ 1.677 trillion).

The total GDP of the major natural resource exporters in the region (Russia, Azerbaijan and Kazakhstan) increased by 35.6 per cent to US$ 1.919 billion; the GDP of other CIS countries – mostly natural resource importers – increased by only 21.4 per cent and was lower at US$ 1.684 billion. The total MVA of the CIS countries with an above average national income per capita (Russia, Azerbaijan, Belarus, and Kazakhstan) increased by 1.2 per cent from 2005-2014 and reached US$ 222.7 billion, surpassing the total MVA of other CIS countries by US$ 210.9 billion.

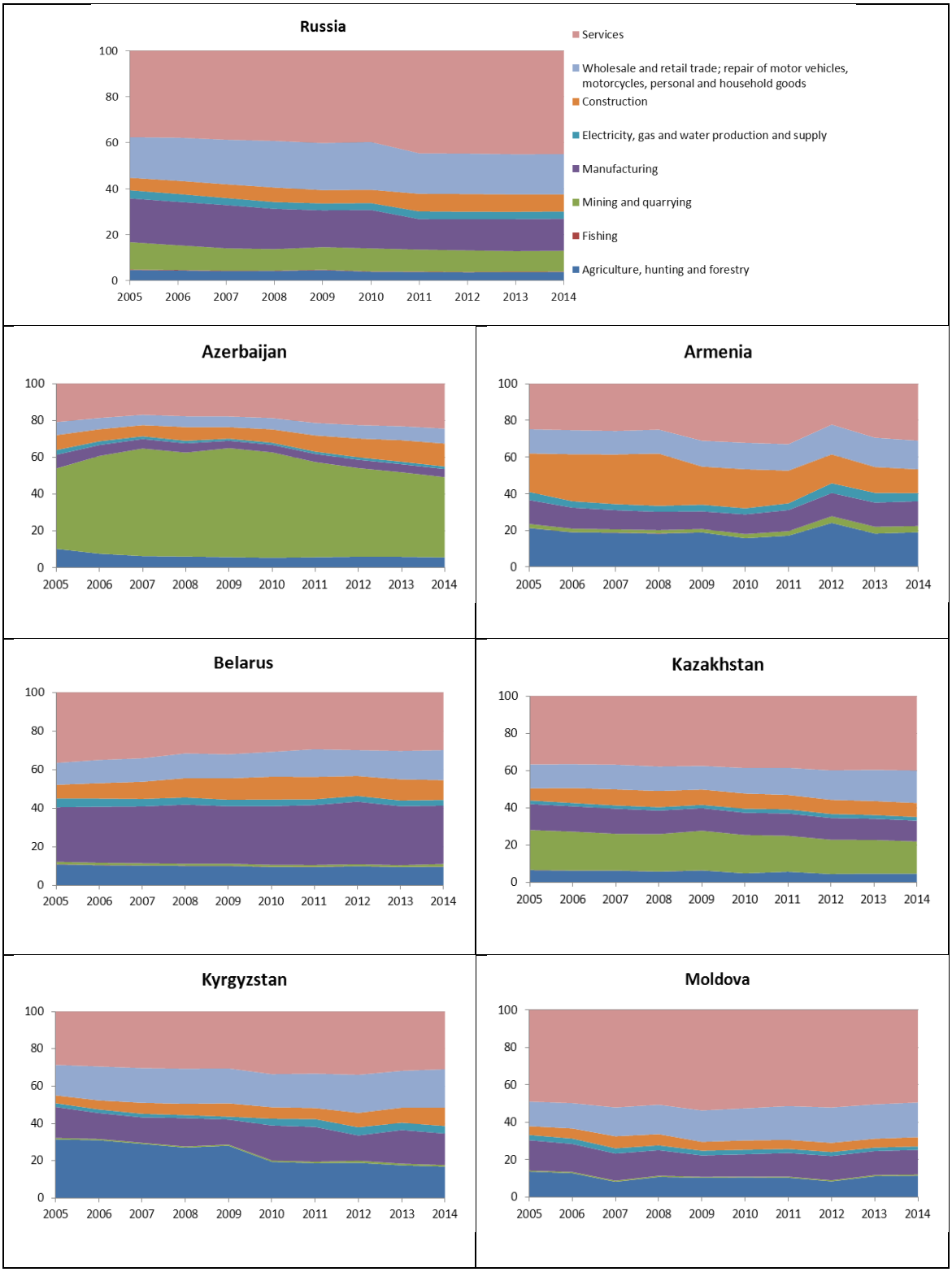
Between 2005 and 2014, the accelerated MVA average annual growth rate in CIS countries with above average industrial capacities (US$ 900 per capita and higher), namely Russia and Kazakhstan, was accompanied by a sharp increase in the gap between these two countries and others, thereby creating a "blank area" of US$ 197.5 billion.

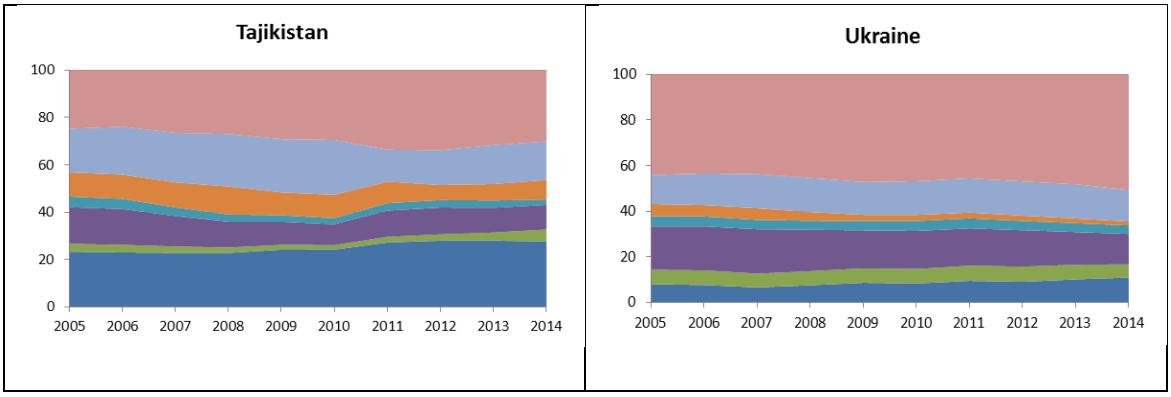
4.2 Structural shifts

This study analyses economic development by measuring the size of national economies, industrialization intensity and the sectoral allocations in the CIS region over the period 2005-2014.

Table A.1 in the Appendix illustrates the GVA structure by main economic activity in the CIS countries. The structure and contributions of the main economic activities to GDP in the CIS countries from 2005-2014 are presented in

Figure 1 Structure of countries' economic development





Source: Rosstat, CIS STAT, authors' calculations.

De-industrialization in the CIS region continued to spread in all countries between 2005 and 2014, with the exception of Azerbaijan, and their economies are characterized primarily by services and trade. The most significant contributor to the economies of Tajikistan, Armenia and Kyrgyzstan was the agricultural sector. The share of mining in GDP was highest among all economic activities in Kazakhstan and Azerbaijan. Belarus had the highest share of manufacturing in national GDP in the region.

Changes in the structure of economic and industrial development in Russia and other CIS countries were analysed by calculating the integral coefficient of structural change (its values are presented in Table A.2, Appendix):

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

where:

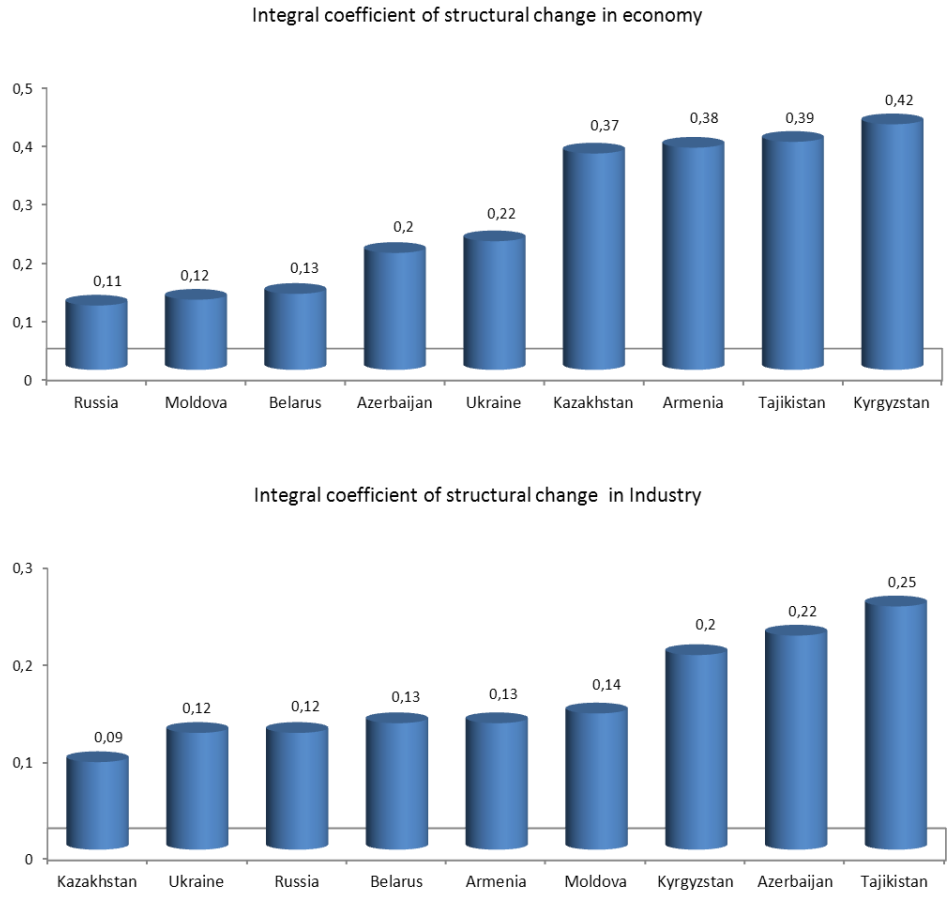
d_{int} = integral coefficient of structural change,

S_i = share of value added of *i* type of economic (industrial) activity in GVA of the country's economy (industry),

n = number of activities.

Figure 2 presents the distribution of the integral coefficients of structural change across the CIS countries.

Figure 2 Integral coefficient of structural change in the economy and industry



Source: Rosstat, CIS STAT, authors' calculations.

The results indicate that the sectoral transformations between 2005 and 2014 were negligent in all CIS countries. The structure of the economy and industry in Russia remained nearly identical. Kyrgyzstan's economy and Tajikistan's industry had the highest indicator values. Significant structural changes were observed in Tajikistan, Armenia and Kazakhstan's economic development, as well as in Azerbaijan and Kyrgyzstan's industrial development.

When analysing structural industrial policies, the country's ability to produce and export manufactured goods must be evaluated based on the shares of certain industrial products in the country's total exports. Table A.2 in the Appendix presents the main results of this calculation for 2005, 2009 and 2014, as well as the absolute changes for the periods 2005-2014, 2009-2014 and 2005-2014 for mining and quarrying; manufacturing; electricity, gas and water supply[2] in all CIS countries. This calculation is necessary to arrive at a preliminary diagnosis of the export

[2] The figures for industrial exports by industrial activity in the period analysed are the authors' estimations. Data source: UNCTADstat database, available at: http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx.

advantages of the national industrial activities, i.e. the ability of each country to promote its industrial products in external markets.

The following structural and sectoral developments in the CIS region in the period analysed deserve mention:

- Mining and quarrying dominated the region's exports and an upward trend was visible in Russia, Azerbaijan and Kazakhstan; these countries continued to be the main exporters of raw materials;
- The contribution of manufacturing to overall exports was lower in Russia, Kazakhstan, and (to a great extent) Azerbaijan in comparison with the other economies in the region;
- The share of manufacturing exports declined in Armenia, Moldova, Tajikistan and Ukraine;
- A significant decrease in manufactured exports was observed in Azerbaijan.

4.3 Production and export capacities

Monitoring the level of industrialization adjusted to the countries' population is one of the most important aspects for analysing the quality and relevance of industrial policies. It provides insights into the national industrial performance with regard to the country's size. Table A.3 in Appendix presents the main results of the value added per capita for certain types of industrial activities across the CIS countries from 2005-2014.

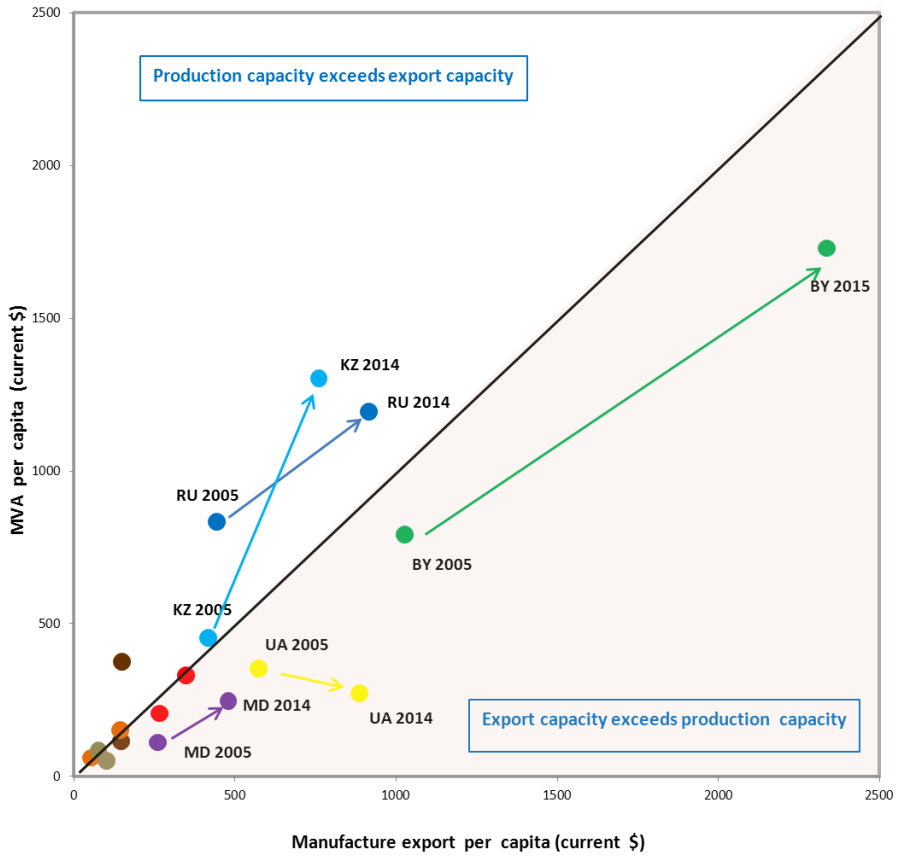
Based on these assessments and the compound annual growth rate (CAGR) for 2005-2014, Russia, Kazakhstan and Belarus were the regional leaders with the highest manufacturing capacities up to 2014, despite a reversal of this positive trend in Belarus at the end of this period. Manufacturing in Moldova, Tajikistan and Kyrgyzstan indicated minimal potential. Azerbaijan and Kazakhstan remained drivers of the expansion of mining production. Mining production was lowest in Kyrgyzstan, Moldova, and Belarus by the end of the decade. In 2014, Azerbaijan and Kazakhstan had a noticeable advantage in mining production; Russia and Kazakhstan in manufacturing; and Kazakhstan, Russia and Armenia in electricity, gas and water production and supply.

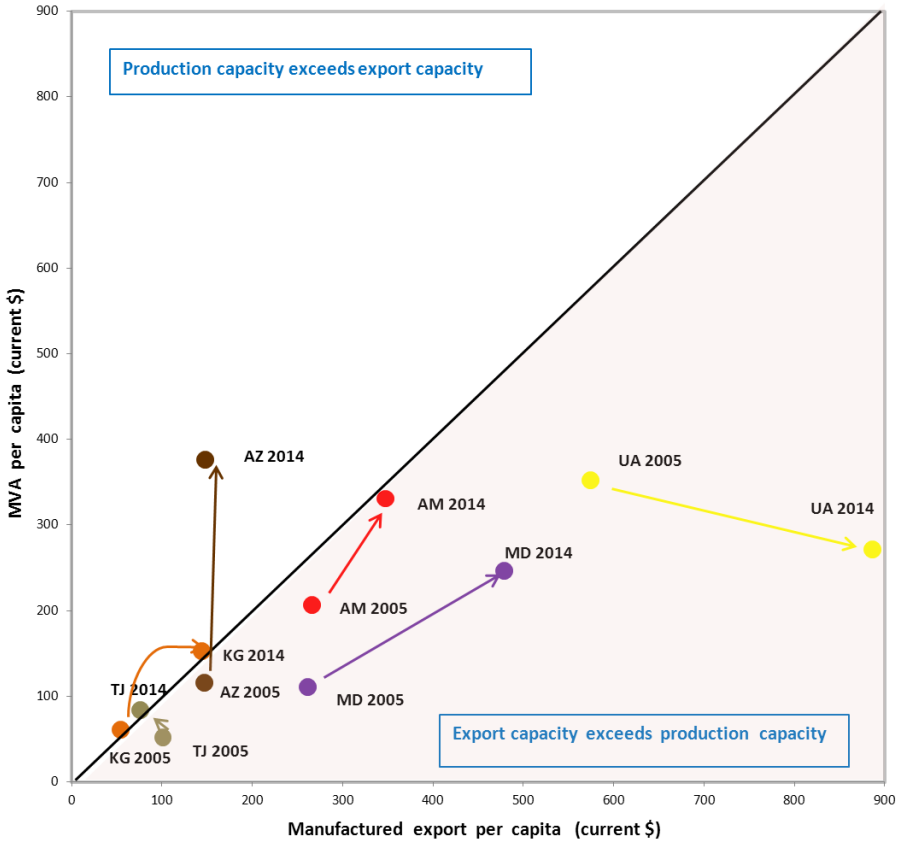
To measure the CIS countries' integration capacity as well as the demand for national industrial production in foreign markets and the competitiveness of specific industrial activities, we calculated industrial exports per capita and their CAGR for the periods 2005-2009, 2009-2014 and 2005-2014. The results are presented in Table A5 in the Appendix.

Belarus ranked highest in terms of growth of manufactured export capacity over 2005-2014, followed by Russia, Ukraine and Kazakhstan. The lowest volume of manufactured exports per capita was recorded in Tajikistan. By 2014, Kazakhstan, Azerbaijan, Russia and Belarus had become drivers of intensive growth in the export of raw materials.

Figure 3 compares the capacities of each CIS country to produce and export manufactured goods over the period 2005-2014.

Figure 3 Production and export capacities of CIS countries





Note: The second graph represents the countries that were concentrated at the beginning of the first graph coordinate system.

Source: Rosstat, CIS STAT, UNCTADstat database, authors' calculations.

The line dividing the quadrant area by 45 degrees defines the ideal matching of MVA per capita and manufactured exports per capita. In the countries located above this line, the production capacities exceeded the exports capacities in 2014 (Russia, Kazakhstan, and Azerbaijan). The closer a country comes to this line, the higher the growth of its manufacturing competitiveness in foreign markets, improvements in the business environment and – with simultaneous GVA growth – the expansion of national wealth (for example, the starting positions of Russia and Kazakhstan in 2005). The further away a country with high levels of production capacity lies from this line, the higher the expansion of domestic demand for given products (Kazakhstan, Russia and Azerbaijan in 2014). Conversely, a low national MVA per capita indicates poor manufacturing competitiveness, the presence of trade barriers, a low degree of integration, and a lack of production capacity for domestic consumption.

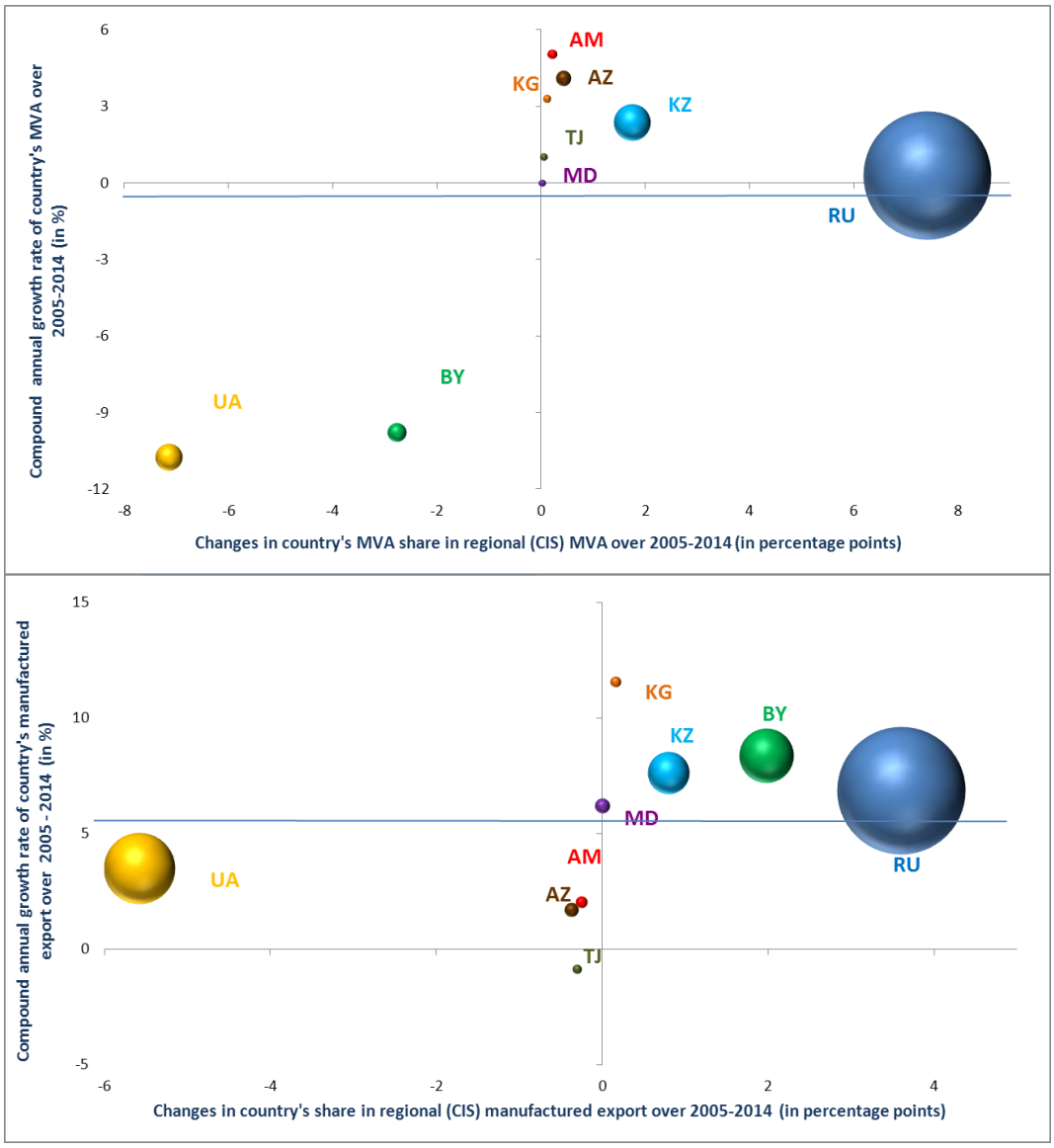
The export capacity of the countries located below the 45 degree line exceeded their production capacity. If a country's MVA level (in absolute terms and per capita) is low and its exports increase, the manufacturing sector largely produces intermediate products not for domestic

consumption, but for final consumption in importing countries. In that case, there is no accumulation of national GVA, manufacturing development or growth of national wealth. If a country's export capacity significantly exceeds its MVA per capita, the country must create effective mechanisms to redirect revenues from its foreign economic activity to real production.

4.4 Significance of manufacturing and impact in the region

The position of each country relative to others based on their contributions to regional MVA indicates whether a country lies at the core of the region or on the periphery (see Figure 4 as well as Tables A.6 and A.7 in the Appendix).

Figure 4 Growth and impact of MVA and manufactured exports of CIS countries



Note: The bubble size denotes the values of country's MVA/manufactured exports; the blue line represents the average growth rate of MVA/manufactured exports for the CIS region.
Source: Rosstat, CIS STAT, UNCTADstat database, authors' calculations.

The accelerated development of the national capacity of manufactured exports compared to the export growth rates in other countries reflects stable or expanding competitiveness of a country's industrial production in the region. The large-scale (for the CIS region) Russian manufactured exports grew faster than the regional average level; however, the CAGR of Russia's MVA remained moderate throughout the period analysed. Kazakhstan (and Azerbaijan but with less presence in the region) had the highest MVA growth rates, despite their MVA levels being lower in general. Belarus steadily outpaced other countries, except Russia, in terms of competitive industrial exports in the region.

All proposed dimensions to measure the effectiveness of national industrial policies in the CIS region are summarized in Table 1. The indicators reflect changes in the countries' capacities, structures and impacts and helps visualize not only the bottlenecks of industrialization in each country, but also the main cross-country balances in the regional economic space.

In the period analysed, large-scale industrialization was only observed in countries with above average national incomes, namely Russia, Kazakhstan (in terms of volume) and Azerbaijan (in terms of growth intensity). This was largely attributable to the lack of structural transformations in other economies in the region. Manufacturing growth in some smaller CIS countries (Armenia, Kyrgyzstan) was quite impressive, but did not lead to a noticeable increase in the countries' participation in highly competitive international processes. As the direction of trends differed in the region, a clear distinction between countries in terms of their specialization could not be made. During the period analysed, the region was characterized by early deindustrialization. Hence, a dependence of national growth on the GVA expansion of services was characteristic of nearly all countries with a middle and low national income per capita.

Table 1 Aggregate evaluation of the countries' manufacturing competitiveness

	Production indicators				Export indicators			
	2005	2009	2014	2005-2014, %	2005	2009	2014	2005-2014, %
Russia								
Structure (%)	19,2	16,0	13,9	-5,3	26,4	24,2	24,8	-1,5
Capacity ($)	1354	1163	1389	0,3	444	511	859	6,8
Impact (%)	77,9	78,9	85,3	7,41	57,5	56,5	61,1	3,6
Azerbaijan								
Structure (%)	7,4	4,0	4,4	-3,0	15,6	4,4	5,0	-10,6
Capacity ($)	210	230	280	2,9	140	105	148	0,5
Impact (%)	0,72	0,98	1,14	0,42	1,08	0,73	0,70	-0,38
Armenia								
Structure (%)	13,1	9,6	13,5	0,5	91,2	80,6	70,2	-21,0
Capacity ($)	210	230	367	5,7	266	170	347	2,7
Impact (%)	0,27	0,35	0,47	0,20	0,77	0,43	0,52	-0,25
Belarus								
Structure (%)	28,3	29,8	30,2	2,0	62,1	59,2	61,3	-0,8
Capacity ($)	1156	1247	422	-9,6	1026	1327	2335	8,6
Impact (%)	4,48	5,63	1,70	-2,78	9,0	9,8	10,9	2,0
Kazakhstan								
Structure (%)	14,0	12,1	11,1	-2,8	22,5	23,1	16,7	-5,9
Capacity ($)	834	774	923	1,0	416	621	760	6,2
Impact (%)	5,06	5,92	6,80	1,74	5,69	7,74	6,49	0,79
Kyrgyzstan								
Structure (%)	16,7	13,4	16,9	0,2	41,8	35,7	51,3	9,5
Capacity ($)	106	98	130	2,0	54	111	144	10,2
Impact (%)	0,22	0,25	0,32	0,10	0,25	0,46	0,41	0,16
Moldova								
Structure (%)	16,2	11,4	13,2	-3,1	85,5	73,3	72,8	-12,8
Capacity ($)	165	140	166	0,1	261	264	479	6,3
Impact (%)	0,236	0,237	0,251	0,02	0,842	0,729	0,841	-0,002
Taikistan								
Structure (%)	15,5	9,7	10,4	-5,0	76,6	73,6	59,2	-17,4
Capacity ($)	91	51	83	-0,9	101	100	76	-2,8
Impact (%)	0,25	0,18	0,29	0,04	0,62	0,57	0,31	-0,31
Ukraine								
Structure (%)	19,0	16,6	13,3	-5,7	78,7	75,0	70,4	-8,4
Capacity ($)	578	345	203	-9,9	574	649	886	4,4
Impact (%)	10,9	7,5	3,7	-7,16	24,3	23,1	18,7	-5,6

Note: Structure is MVA share in GDP/manufactured exports in the country's total exports; capacity is MVA/manufactured exports per capita; impact is the country's MVA/manufactured export share in total regional (CIS) MVA/manufactured exports.

Source: Rosstat, CIS STAT, UNCTADstat database, authors' calculations, UNIDO recommendations.

5. Manufacturing properties in the CIS

5.1 Value-added structure across industries

To evaluate the main factors that determine the regional development of manufacturing industries, we examined the competitive performance of industries with different technological levels in the CIS from 2005-2014.

The manufacturing classification used in this study is based on the International Standard Industrial Classification (ISIC) [UN, 2005] and the Standard International Trade Classification (SITC) [UNCTAD, 2016b], as well as on the OECD classification. The latter links R&D expenditure to value added and production statistics [OECD, 2005]; it was adapted to the CIS region's unique characteristics. The manufacturing classification according to level of technology and ability to increase industrial value added is based on S. Lall's studies, who was the first to attempt to cover a number of aspects of technological upgrading using national statistics [Lall, 2000].

The industrial classification used in this study corresponds to the majority of analytical concepts of the technological ranking of industrial production and includes the following technology categories: resource-based (RB), low-tech (LT) and medium- and high-tech (MHT) industries. However, all industrial classifications should be called conditional in terms of international competitiveness; to achieve this, all industrial activities must be continuously upgraded, regardless of their level of technological development.

Table A.8 in the Appendix presents the distribution of activities according to the technological structure of the manufacturing sector in the CIS countries in line with national priorities[3]. The basic assumption for the allocation of industrial activities to the groups of technological sophistication is sufficiency and availability of a constant set of comparable data at the ISIC 2-digit level of disaggregation [UN, 2005] in all analysed CIS countries for a prolonged period.

The main impulses of structural transformation across economic sectors, which can increase national GVA, initially emerge within sectors and are caused by shifts between industries. When manufacturing industries with different technological levels trigger such a development, the structural reallocation towards MHT industries and the predominance of capital- and technology intensive enterprises contribute to primarily expanding industries of high value added.

[3] See also [Upadhyaya et al, 2016; UNIDO and GIZ, 2015; Government of URT and UNIDO, 2012; Government of Nepal and UNIDO, 2014].

Box 1 Region-wide format

In 2014, the regional MVA (CIS-9) amounted to US$ 234.5 billion, 24 per cent of which accounted for MHT industries, and 27 per cent and 49 per cent – RB and LT industries, respectively.

By 2014, the regional MVA decreased by 6 per cent compared to 2005, while the GDP of the CIS countries increased by 27 per cent.

The average annual growth rate of the regional MVA was -0.6 per cent from 2005-2014, while regional manufactured exports increased on average by 6.2 per cent annually.

Regional manufactured exports increased by US$ 91.7 billion to a total of US$ 202.5 billion in 2014 compared to 2005. At the end of the period analysed, the share of MHT exports in total regional exports reached 36 per cent, and the RB and LT shares by 23 per cent and 41 per cent, respectively.

Over 2005-2014, the total MVA of the CIS countries with a higher than average national income per capita (Azerbaijan, Belarus, Kazakhstan, Russia) increased by 1.2 per cent and amounted to US$ 222.7 billion; manufactured exports reached US$ 160.3 billion at the end of the period compared to US$ 81.1 billion in 2005.

In countries with a middle national income per capita (Armenia, Moldova, Ukraine), total MVA had reached US$ 10.4 billion by 2014, 37 per cent higher than that of 2005; the growth rate of manufactured exports amounted to a maximum value of US$ 40.9 billion in 2014.

The MVA in countries with a low national income per capita (Kyrgyzstan, Tajikistan) was US$ 1.4 million in 2014, an increase of 24 per cent, while exports increased by US$ 0.5 billion compared to US$ 1.0 billion in 2005.

Over the past decade, the CIS contribution to world MVA declined by 0.3 per cent; manufactured exports from the CIS to third countries amounted to 1.06 per cent of world exports (US$14.033 billion) in 2014 compared to 1.01 per cent in 2005.

Different tendencies, which were not necessarily related to the countries' homogeneity, were characteristic for the CIS region. Value added in RB industries developed most dynamically in Azerbaijan and Armenia – two countries with different national incomes per capita, but whose industrial capacities were similar over the entire period analysed. In these two countries, the growth of LT value added was similar as was the strategy setting in sectoral manufacturing development. However, the actual LT value added differed significantly (US$ 1.274 billion in Azerbaijan vs US$ 358.6 billion in Armenia) by 2014.

In the first group of countries with an above average national income per capita (except Azerbaijan) and a high starting industrial capacity (in 2005), a major and continual shift towards high-tech manufacturing industries (at 13.8 per cent per year) took place in Kazakhstan in the last 5 years of the period analysed. Less intensive changes (at 7.5 per cent annually) were observed in Russia; however, the MHT value added in Russia was higher than that in all other CIS countries by nearly 12.5 times. In 2014, Belarus had retained its traditional MVA structure – with approximately equal shares of industries with different levels of technology; however, the decline of MHT industries increased the negative gaps in total MVA.

Among the countries with a middle national income per capita and a lower starting industrial capacity, the positive vector of MVA extensions (insignificant for a country) in MHT industries simultaneously with sluggish growth in RB industries was evident only in Moldova. However, these changes did not result in noticeable shifts in the structure of national value added.

In countries with a low national income per capita and a low starting industrial capacity, particularly Tajikistan, a deepening structural imbalance in manufacturing was the main trend after the 2009 financial crisis. Manufacturing developed primarily in terms of extension of RB industries, which are labour-intensive and meet the lowest barriers to entry into local markets. The value added of LT and MHT shrank.

The dynamic expansion of MHT industries in MVA, which are essential for the accumulation of capital and a country's knowledge base, was only recorded in Russia and Kazakhstan.

The key problem for Russia in the 2005-2014 period was, above all, its MVA structure, which was traditionally built on LT manufacturing. The country's industrial base consisted of low value added production, and the national needs for high-tech and high-value products were primarily met by imports for a long time. The period 2005-2014 was marked by ruble depreciation and rising cost of total production factors. Under such circumstances, sectoral imbalances, high competitiveness of imported products, and the State's support for specific activities only significantly limited any structural diversification of Russia's manufacturing sector.

In the CIS countries (with the exception of Belarus, which had the most balanced MVA structure), the structural imbalances of industries' contributions to manufacturing increased. This was not only observed where sectoral MVA growth was absent or stable yet moderate, but also even when it was strong and dynamic. It intensified the vulnerability of all regional economies due to their high convergence and exposure to external shocks. Among the countries with an above average national income per capita, shifting industrial structures towards MHT

industries took place only in Russia and Kazakhstan. Among the other groups of countries with middle and low national incomes per capita, manufacturing only shifted towards certain RB industries in Moldova (despite its traditional prevalence of RB industries in absolute terms) and Kyrgyzstan, and increasing contributions to MVA with a higher technological level were achieved.

All CIS countries with a high industrial capacity and an above average level of national income per capita had significant MVA values in food and beverages, coke and refined petroleum products, chemical and chemical products, other non-metallic mineral products and basic metals. These industrial activities became the leaders in the CIS region and determined the regional manufacturing specialization.

However, the ratio of countries with the fastest and the slowest growth rate in MHT industries (4:5) do not allow defining the CIS region as one with an advanced technological growth.

Calculating the coefficients of manufacturing structural changes (presented in Table 2) make an evaluation of the degree of changes taking place in the CIS countries over the 2005-2014 period possible.

Table 2 Manufacturing structural changes across the countries

	Coefficient of absolute structural change $d(x)_{abs}$	Coefficient of relative structural change d^2_{rel}	Integral coefficient of structural change d_{int}
Russia	1,908	0,017	0,036
Azerbaijan	1,267	0,031	0,047
Armenia	7,860	0,507	0,291
Belarus	4,960	0,091	0,082
Kazakhstan	2,580	0,338	0,131
Kyrgyzstan	5,860	0,397	0,253
Moldova	2,547	0,042	0,055
Tajikistan	26,000	3,092	0,360
Ukraine	8,327	0,322	0,149

Source: Rosstat, CIS STAT, authors' calculations, UNIDO recommendations [UNIDO, 2010].

Box 2 Coefficients of structural change

In the study, the coefficients of absolute and relative structural change and an integral coefficient of structural change are calculated as:

$$d(x)_{abs} = \frac{\sum_1^n |S_{i\,2014} - S_{i\,2005}|}{n}$$

$$d^2{}_{rel} = \left(\frac{S_{i\,2014} - S_{i\,2005}}{S_{i\,2005}}\right)^2$$

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

where:

$d(x)_{abs}$ = coefficient of absolute structural change

$d^2{}_{rel}$ = coefficient of relative structural change

d_{int} = integral coefficient of structural change

S_i = share of value added of the industry □ in MVA

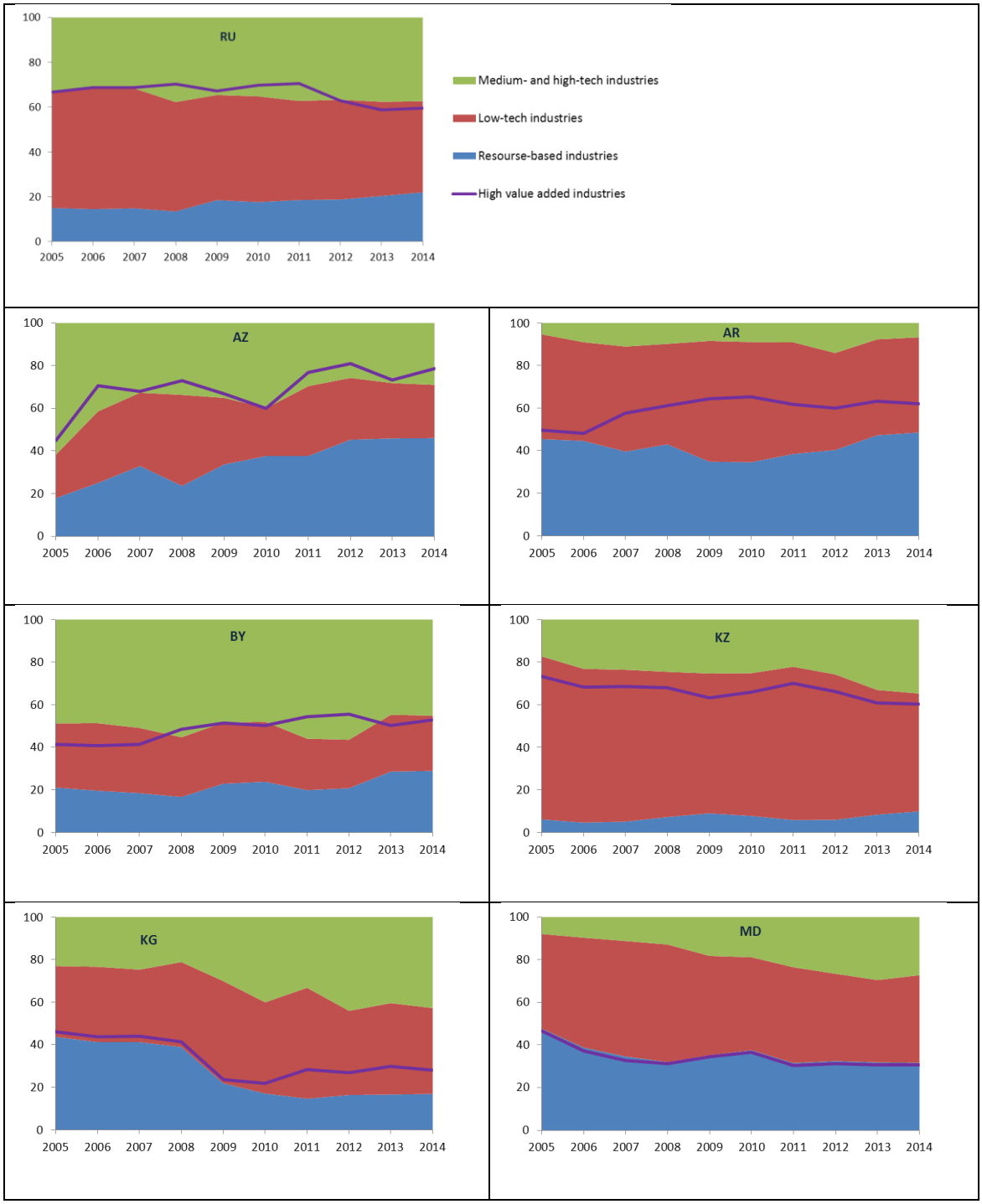
n = number of manufacturing industries

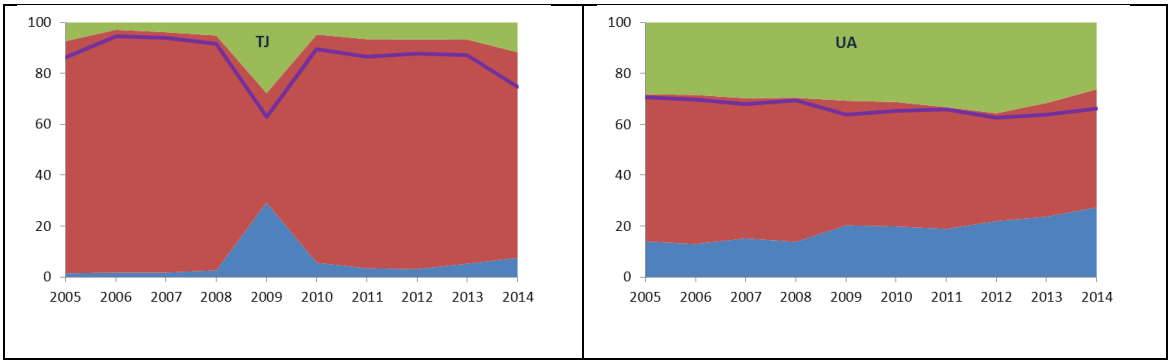
Based on the coefficients' values, we can conclude that any significant sectoral reallocation in the CIS region was practically absent over the period 2005-2014. The manufacturing structure remained almost unchanged in Russia, Azerbaijan, Belarus and Moldova. Minor changes took place in Kazakhstan and Ukraine's manufacturing industries. Tajikistan, Armenia and Kyrgyzstan experienced the most significant structural shifts among all CIS countries.

5.2 Tendencies and shifts in export structure

The industrial export structure in the CIS region is presented in Figure 5; these figures provide insights into ability of each country to export manufactured products in accordance with their technological level and value added share.

Figure 5 **Manufactured exports distribution across groups of industries (%)**





Source: UNCTADstat database, authors' calculations.

Table A.9 in the Appendix presents all contributions of exports with different technological levels to the total volume of manufactured exports and the average annual rate of their changes in the CIS region.

Box 3 Sectoral drivers of industrial exports growth in the region

Within the period analysed, Russian exports made up the main bulk of regional manufactured exports with an average rate of 6.2 per cent per year; in 2014, manufactured exports reached US$ 202.5 billion.

There was a steady demand for food products, including beverages and tobacco; exports of these products from all CIS countries increased over 2005-2014 by 3.6 times, significantly exceeding the growth rate of total industrial exports in the region.

The export of basic metals and fabricated metal products signified the successful export policies of some industrialized CIS countries; this led to an increase in the supply to foreign markets from US$ 48.7 billion in 2005 to US$ 61.7 billion in 2014.

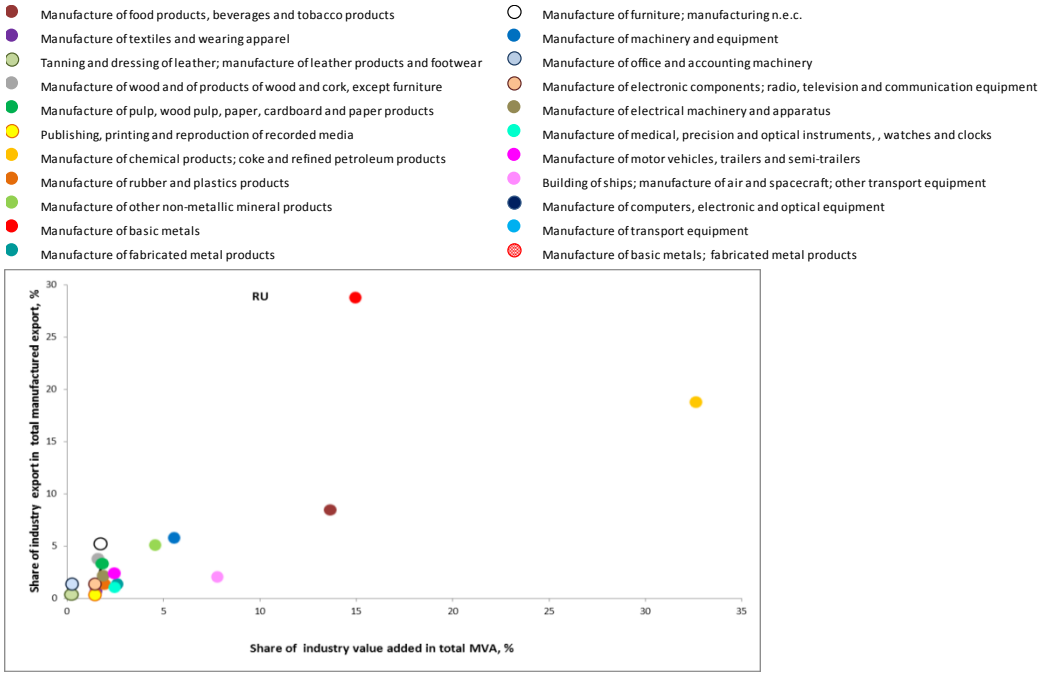
The share of exports of chemical products rose from 14.8 per cent on average for all exporters in 2005 to 17.4 per cent by 2014.

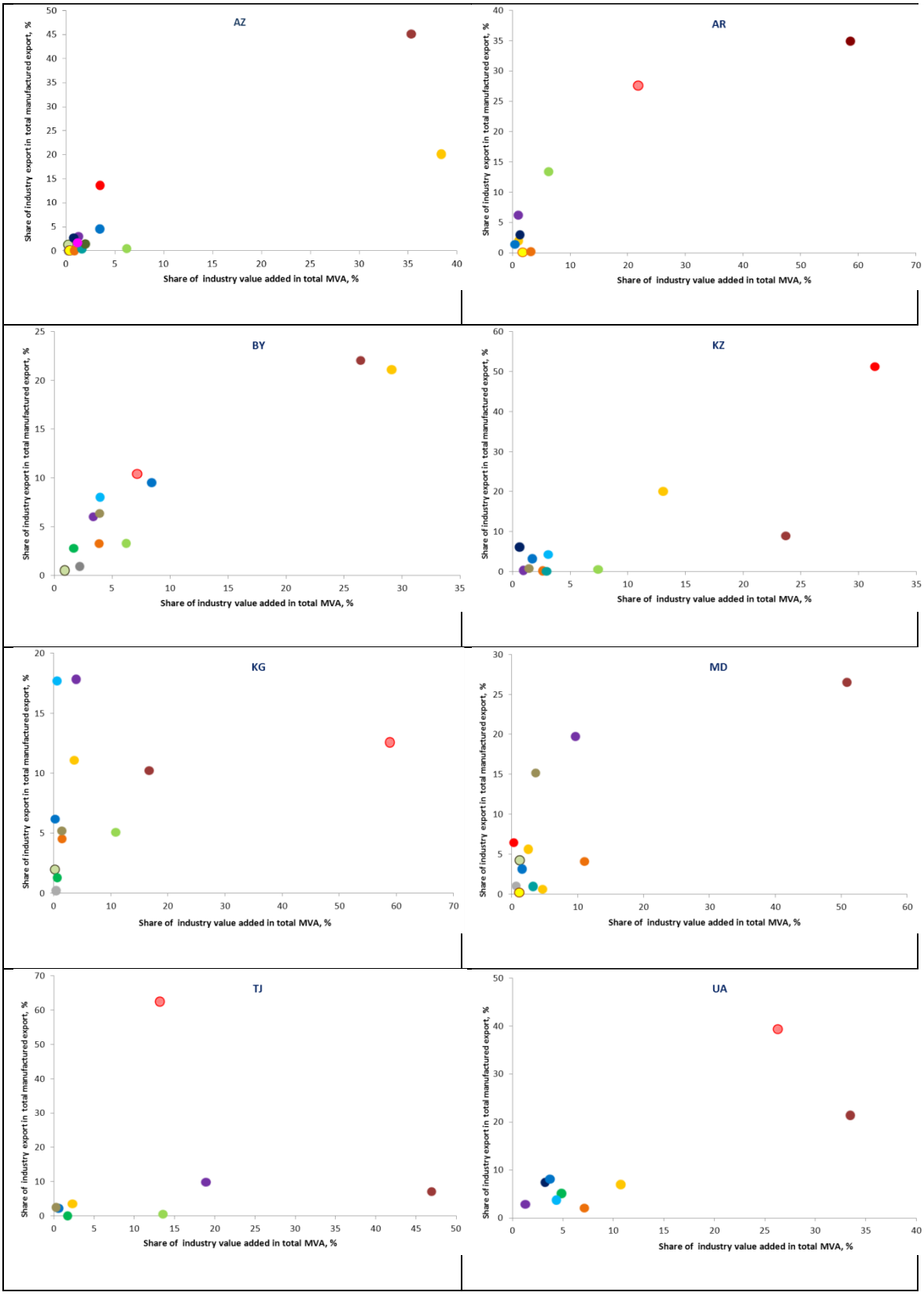
The total exports of machinery and equipment (including electrical, electronic equipment, motor vehicles and other transport equipment) from the largest regional exporters (Russia, Belarus, Ukraine) increased by US$ 15.8 billion to reach US$ 34.1 billion in 2014; the exports accounted for 92.5 per cent of the total regional exports of these high-tech products. This demonstrates that the competitiveness of regional leaders of HT manufactured exports steadily improved, but it also reflects the gap that remained to smaller industrial exporters.

A joint analysis of the national structure of exports and production at industry level was carried out to assess the shift of manufacturing industries towards generating added value and their potential to contribute to expanding the supply of competitive products to foreign markets. This

also helps identify the countries that are most advanced in terms of development. The relevant indicators are presented in Tables A.9 and A.10 in the Appendix and illustrated for all countries analysed in Figure 6.

Figure 6 Distribution of manufacturing industries according to share in MVA and exports





Source: Rosstat, CIS STAT, UNCTADstat database, authors' calculations.

Among the industries with a high value added in the CIS region, basic metals and fabricated metal products accounted for the highest exports by 2014, primarily from Russia, Ukraine and Kazakhstan. Russia, Azerbaijan, Belarus and Kazakhstan were the main exporters of chemical and refined petroleum products. Food products were mainly exported from Russia, Ukraine, Belarus, Moldova, Armenia, Kazakhstan, Kyrgyzstan and Azerbaijan. Russia and Belarus had the highest exports of machinery and equipment by 2014.

Significant exports of textile products, as well as motor vehicles, trailers and semi-trailers were recorded in Kyrgyzstan; electrical machinery and equipment, furniture in Moldova; and chemical and refined petroleum products, machinery and equipment in Ukraine.

For some manufacturing industries, external demand was not significant enough to identify their exports as representing the country's specialization in international labour division, but their growth rates considerably exceeded total industrial exports over 2005-2014. These clusters of varying technological profiles with very high exports to other countries were common to nearly all CIS countries. These clusters include the manufacture of office and accounting machinery and equipment; electronic components, radio, television and communication equipment; furniture; leather and leather products; wearing apparel; other non-metallic mineral products; pulp and paper. Tables 3 and 4 present the relevant indicators of intensity and quality for the CIS countries.

Over the period analysed, only in Belarus and Russia did the industrialization process expand with a maximum intensity (for the region) through a strengthening of technologically advanced industries that create higher value added. Despite the marked decrease in the rate of industrialization in Ukraine, the technological upgrading of the country's manufacturing industries was notable. The intensity of the industrial process in Kazakhstan, which is part of the group of countries deemed regional technological leaders, practically did not change over the period analysed.

Table 3 Industrialization intensity in the CIS countries

	MVA share of medium- and high-tech industries in total MVA (%)		MVA share in total GVA of country (%)		Composite indicator of industrialization intensity		CAGR (%)
	2005	2014	2005	2014	2005	2014	2005-2014
Russia	26.7	29.6	19.2	13.9	23.0	21.8	-0.5
Azerbaijan	9.0	10.5	7.4	4.4	8.2	7.5	-0.9
Armenia	7.5	3.0	13.1	13.5	10.3	8.3	-2.2
Belarus	31.7	28.6	28.3	30.2	30.0	29.4	-0.2
Kazakhstan	6.7	9.4	14.0	11.1	10.3	10.3	-0.1
Kyrgyzstan	7.5	2.9	16.7	16.9	12.1	9.9	-2.0
Moldova	6.5	7.5	15.5	13.2	11.0	10.3	-0.6
Tajikistan	2.9	2.4	15.5	10.4	9.2	6.4	-3.5
Ukraine	23.0	19.9	19.0	8.5	21.0	14.2	-3.9

Note: Composite indicator of industrialization intensity is the arithmetic mean of MVA share in GDP and the share of MHT activities in MVA.

Source: Rosstat, CIS STAT, authors' calculations.

Table 4 Technological level of exported products

	Share of MHT exports in total manufactured exports (%)		Share of manufactured exports in total exports (%)		Composite indicator of exports quality		CAGR (%)
	2005	2014	2005	2014	2005	2014	2005-2014
Russia	33.7	37.3	26.4	24.8	30.1	31.1	0.3
Azerbaijan	61.7	29.0	15.6	5.0	38.7	17.0	-7.9
Armenia	5.3	6.7	91.2	70.2	48.3	38.5	-2.2
Belarus	48.8	45.1	62.0	61.2	55.4	53.2	-0.4
Kazakhstan	17.3	34.8	22.7	16.8	20.0	25.8	2.6
Kyrgyzstan	23.0	42.8	41.8	51.3	32.4	47.1	3.8
Moldova	7.9	27.3	85.6	72.8	46.8	50.0	0.7
Tajikistan	7.3	11.7	76.6	59.2	41.9	35.4	-1.7
Ukraine	28.2	26.3	78.7	70.4	53.5	48.3	-1.0

Note: Composite indicator of export quality is the arithmetic mean of the share of MHT exports in total manufactured exports and the share of manufactured exports in total exports.

Source: UNCTADstat database, authors' calculations.

Over the entire period analysed, the highest exports quality in terms of technological content was observed in Belarus, Moldova and Ukraine. The technological level of manufactured exports nearly doubled in Kyrgyzstan; at the same time, the quality of the country's export basket achieved the highest improvement in in the region. The most significant decline in the quality of a country's export basket (-7.9 per cent per year) was recorded in Azerbaijan over 2005-2014. The content of the manufactured export basket improved significantly in Tajikistan; although the reduction in manufacturing's contribution to total exports in 2014 led to its quality deterioration. The contribution of MHT products to manufactured exports in Russia expanded too insignificantly to promote a marked improvement in the country's exports quality while the overall level of manufactured exports stagnated.

However, the export structure indicators in nearly all CIS countries (except Russia) were not in line with the structural change in MVA, which would have otherwise contributed to the generation of higher MVA, technological upgrading and to the deepening of the competitive export structure. In 2014, assessments of the quality of manufactured exports significantly exceeded industrialization intensity in Tajikistan (by 6 times), Moldova, Kyrgyzstan and Armenia (by 5 times, on average), Azerbaijan and Ukraine (by 2.5 times, on average); this indicated large-scale assembly production in the region.

3.3. Sectoral profile of production and export capacities and regional impact

In 2014, Russia, Belarus and Kazakhstan continued to lead in terms of the production and export capacities of MHT industries among countries with an above average national income per capita. However, the level, direction and rate of change in these countries since 2005 differed significantly. The highest MVA per capita (US$ 410) and manufactured exports per capita (US$ 320.7) of medium- and high-tech products remained stable in Russia, although the production capacity exceeded the realized external demand for such products (due to domestic consumption) and despite the fact that the average annual growth rate of the export potential was higher. Belarus and Kazakhstan followed Russia with large gaps in MHT production capacity parameters: in 2014, the share of medium- and high-tech products in the MVA per capita of these two countries was 3.5 and 4 times lower than Russia's. Meanwhile, in Belarus, a sharp decline of MHT in MVA per capita was accompanied by an accelerated expansion (by 7.7 per cent per year) of MHT exports, which exceeded similar Russian exports by 3 times. In Kazakhstan, the changes in both the production and export of MHT were positive, with a much more intensive export growth rate (by 8.1 per cent). In all other countries with a lower level of national income per capita, the export capacities expanded much more rapidly, resulting in considerably exceeding the MHT value added per capita by the end of the decade.

Box 4 Regional leaders in production and export capacity

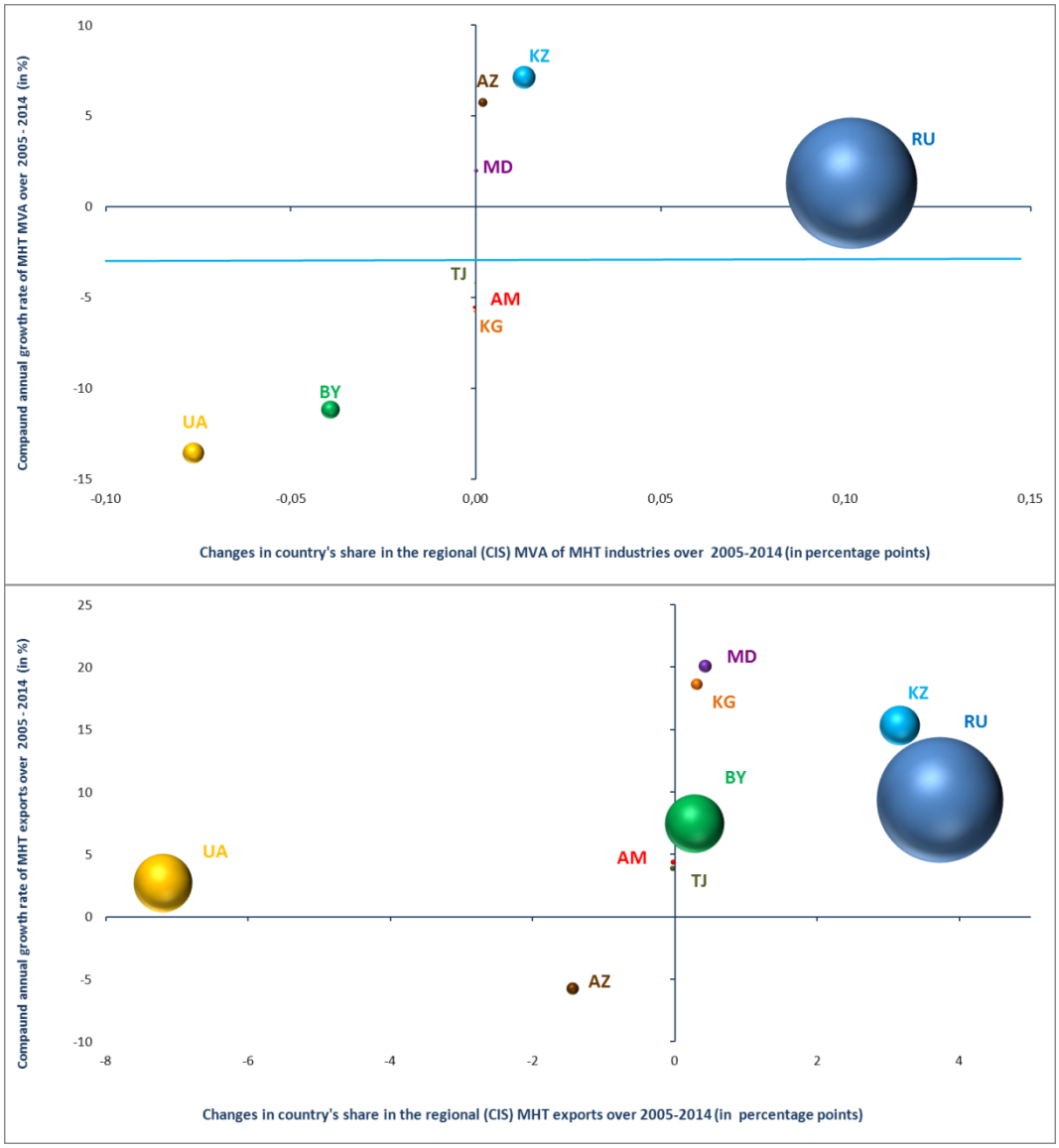
In 2014, food production consistently dominated the manufacturing sector with high shares in MVA in all CIS countries. Regional food production capacity reached US$ 1,032 per capita in 2014 compared to US$ 1,058 in 2005, while the export capacity amounted to US$ 1,186 (per capita) in 2014, mainly due to food exports from Belarus, Moldova and Ukraine.

The main driver in high value added industries included the chemical and refined petroleum industries in Russia, Azerbaijan and Belarus – the MVA per capita of these two industries for the three countries together amounted to US$ 683 in 2014 compared to US$ 695 for similar exported products (mainly attributable to Belarus' export potential).

Basic metals and fabricated metal products dominated the region's low-tech manufacturing activities, with high value added contributions in all CIS countries except Azerbaijan, Belarus and Moldova. The production capacity per capita reached US$ 717.4 in 2014, US$ 154 less than in 2005, mainly because of a noticeable decline in the manufacture of basic metals and fabricated metal products in Ukraine, Tajikistan and Russia. At the same time, the significant expansion in the per capita export capacity of these products (US$ 1,142) resulted in these industries ranking second in regional manufactured exports.

Figures 7 and 8 illustrate the relationship between MVA and the grown in manufactured exports of industries with high value added and MHT industries across the countries according to their impact on the region.

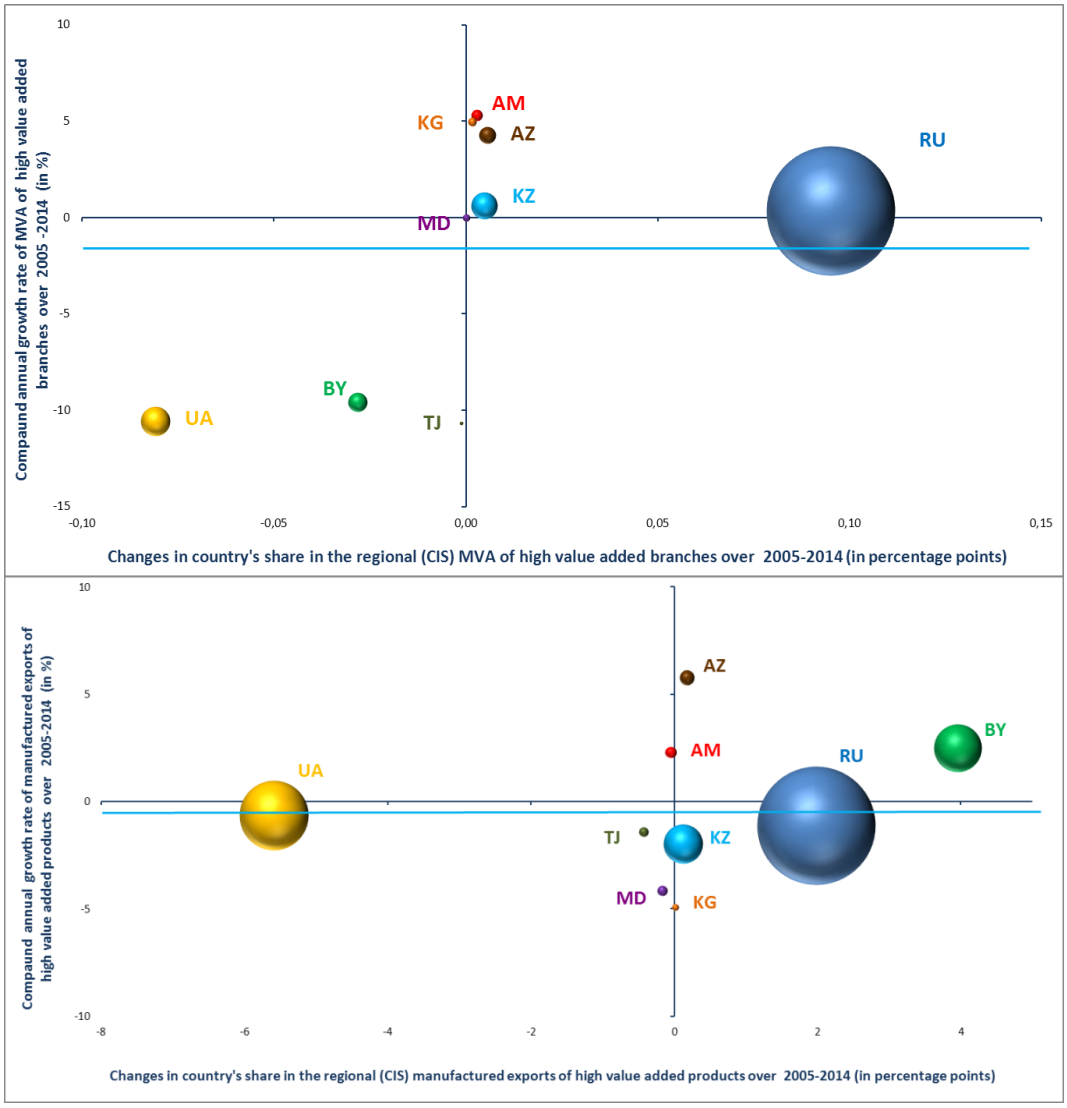
Figure 7 Relationship between growth and impact of MHT value added and exports



Note: Bubble sizes indicate the volume of MHT MVA/exports in 2014 at current US$; the blue line represents the average growth rate of MHT MVA/exports in the CIS region.

Source: Rosstat, CIS STAT, UNCTADstat database, authors' calculations.

Figure 8 Relationship between growth and impact of high value added MVA and exports



Note: Bubble sizes indicate the volume of high value added MVA/manufactured exports in 2014 at current US$; the blue line represents the average growth rate of high value added MVA/manufactured exports in the CIS region.

Source: Rosstat, CIS Statistical Committee, UNCTADstat database, authors' calculations.

Regional participation of Russian MHT exports expanded over 2005-2014, with an average annual growth rate that slightly exceeded the regional one; however, Russia most noticeably increased its share in regional MHT exports because it recorded the highest export growth. Kazakhstan, despite its lower value of MHT exports, ranked second in the CIS due to the country's fast growth above the regional average and the significant extension of the share in regional industrial exports; Kazakhstan was far ahead of Belarus and Ukraine in terms of export values. Azerbaijan had the least significant average annual growth rate in the region; it was an outsider in terms of regional contribution to MHT in external markets and their competitiveness. Ukraine, Armenia and Tajikistan were on the periphery of the CIS region. Ukraine's export

share in the regional market declined more than in other countries. In the region, high-tech exports played the least significant role for Armenia and Tajikistan, and at the same time, stagnated considerably. The two remaining benchmarking countries – Moldova and Kyrgyzstan – increased their volume of exports; as a result, they were middle contributors to regional participation.

6. Effects of industrial "road maps" in CIS

6.1 Technological upgrading and diversification

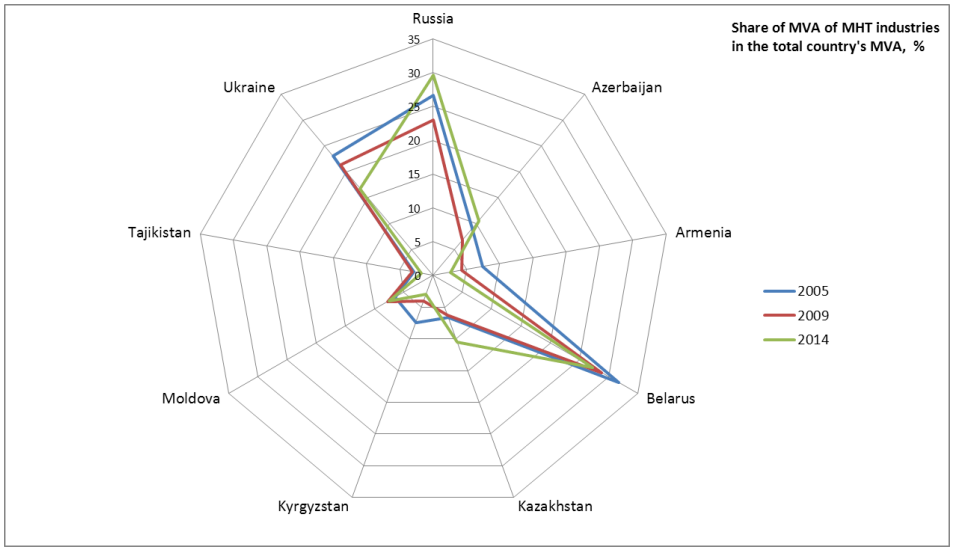
In the period analysed, sustainability was chosen as a key challenge to global development [Meadows et al., 2008]; in this regard, manufacturing is considered an indispensable tool [UNIDO, 2013a]. However, the main trends in manufacturing of the CIS' cross-border integration from 2005 to 2014 were irregularity, different paths and pronounced volatility. The overall profile of all economic processes in the CIS is still heavily influenced by the countries' geopolitical and industrial leaders and their interactions with others.

By 2014, a main cluster of countries including Russia, Kazakhstan, Ukraine and Belarus (despite its significant decline in the indicators measured in US$ in 2014) had crystallized. Strong industrialization, substantial national income per capita, high production and export capacities, marked contributions of all industrial activities to value added and considerable impact on regional manufacturing were common for the countries in this cluster. Azerbaijan and (with some gap) Armenia represented a middle niche of countries with catching up development and further industrialization according to estimates. These countries were ahead of a cluster of other peripheral CIS countries with catching up and decelerating industrial development.

To measure the potential of production and export upgrading of the CIS countries at the level of industries, we used the indicators MVA and technological content of manufactured exports, as well as MHT production and diversification level of exports. We simultaneously compared the technological structures of production and exports and evaluated the concentration of MHT content of MVA and manufactured exports in each country.

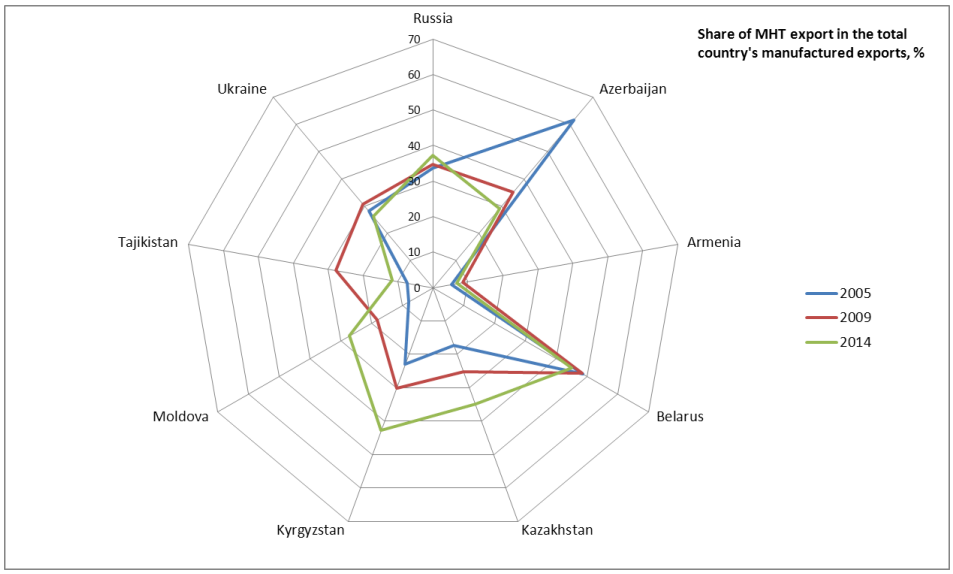
Figures 9 and 10 illustrate the changes in the levels of technological upgrading of the CIS countries as shares of MHT activities in total MVA and manufactured exports over 2005-2014.

Figure 9 Technological structure of MVA, upgrading potential



Source: Rosstat, CIS STAT, authors' calculations.

Figure 10 Technological structure of manufactured exports

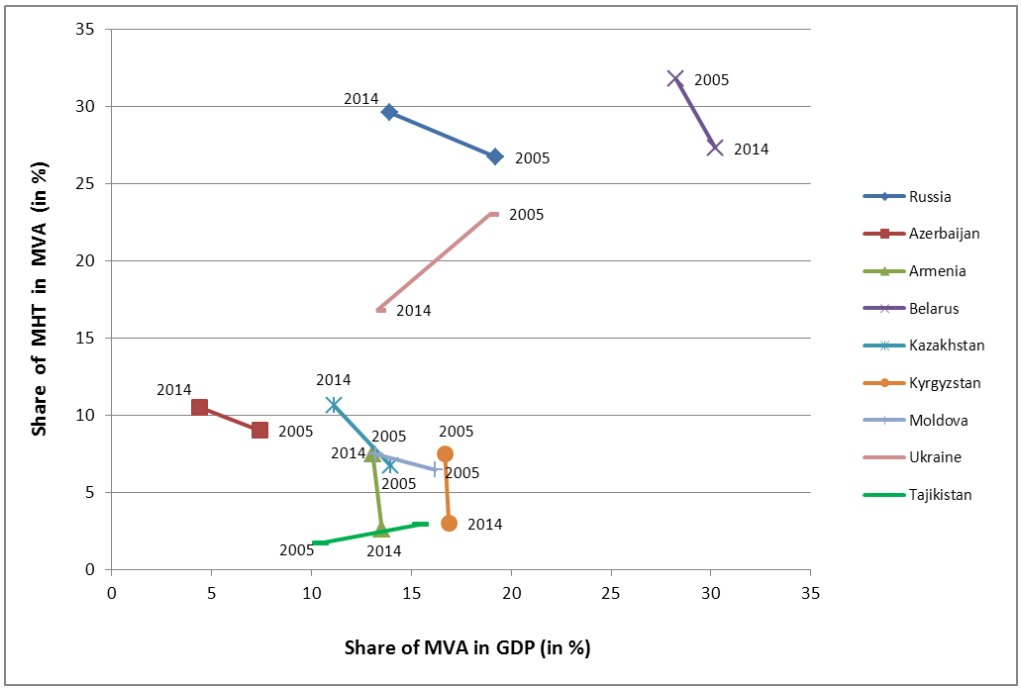


Source: Rosstat, CIS STAT, authors' calculations.

The distribution of CIS countries according to technological upgrading potential largely reflects their differences in industrial capacity and national income per capita – the countries' manufacturing technological contents rises when these indicators increase. This allows us to define country groups with varying upgrading intensities. The main group with long overdue and sustainable upgrading includes Russia and Belarus. The second group of moderate modernizers consists of Ukraine, Azerbaijan and Kazakhstan. The technological structure of manufacturing industries in other countries is characterized by emerging modernization.

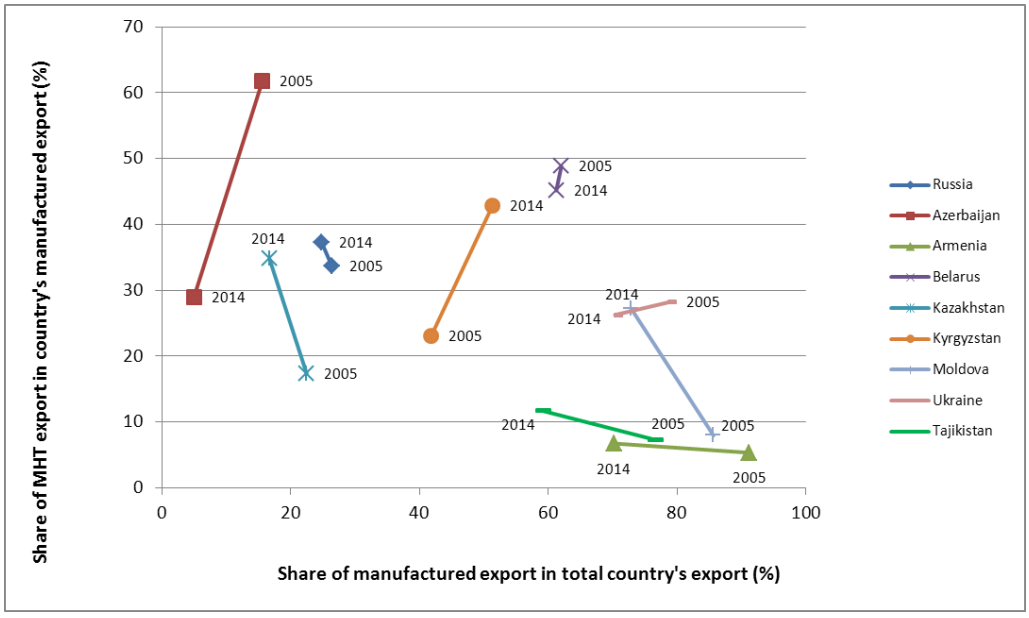
The targets of national manufacturing development suggest that MVA and manufactured exports grew faster than the relevant parameters of all industrial activity in general, while technologically sophisticated value-added and exports within the manufacturing sector expanded exponentially (Figures 11 and 12).

Figure 11 Evolution of industrialization intensity



Source: Rosstat, CIS STAT, authors' calculations.

Figure 12 Evolution of export structure towards technology-intensive exports



Source: Rosstat, CIS STAT, authors' calculations.

The aim for a country's vector of movement in time is to increase its manufacturing share in the total indicator value, and simultaneously, to shift the indicator structure towards more technology intensive industries. The CIS countries' changes in patterns of industrialization intensity differed markedly. Russia was characterized by a gradual decline in MVA over 2005-2014, mainly as a result of a large-scale expansion of services and the construction sector; on the other hand, the dynamics of the share of MHT activities showed an upward trend. A similar development was evident in Kazakhstan, Moldova and Azerbaijan. Industrial development in Belarus, Armenia and Kyrgyzstan moved with various intensities in the opposite direction – towards deterioration of the MVA technological structure. At the same time, a growth in MVA contribution to GDP was recorded, largely due to a sharp reduction in services value added in Belarus, construction and agriculture in Armenia, and agriculture in Kyrgyzstan. By the end of the period, Ukraine and Tajikistan experienced strong contractions of MVA share in GDP in conjunction with the expansion of the services sector and some reduction in MHT industries.

In other words, over the period analysed, no CIS country successfully enhanced its MVA contribution to national GDP and improved its MVA technological content simultaneously.

Only two trends were visible in the CIS region's (except Kyrgyzstan) export structure development. One country group – Russia, Kazakhstan, Moldova, Armenia and Tajikistan – experienced a decreasing share of manufactured exports in total exports along with an increasing share of exports in more technologically sophisticated products. In the country group covering Belarus, Ukraine and Azerbaijan, the opposite trend was observed. Only Kyrgyzstan showed a sharp rise for both indicators.

Determining which industries create the highest value added provides insights into the extent of contributions from a priori high-income industries to national MVA and manufactured exports. It also sheds light on the question whether an advanced exports structure is the result of a higher capacity or participation in assembly production and exports of intermediate products with low value added.

Box 5 Indices of production and exports diversification

The analysis of a country's upgrading potential should be supplemented with an assessment of the diversification levels of MHT production and exports. Such indicators help determine the extent to which MHT value added and exports are concentrated in a limited range of industries or whether they are distributed across many industries and how production distribution is associated with the degree of export diversification.

Within the framework of relative efficiency of the national industrial strategies in the region, the indicators characterize the country's ability to diversify MHT industries and reduce the vulnerability of manufacturing in the cross-border competitive environment, and provides for benchmarking across countries. To determine a country's reliance on certain manufacturing industries, all industries are grouped according to the relevance of their final products in international trade flows using the Hirschman-Herfindahl Index (HHI). This index covers the entire distribution of technologically advanced industries (or products within industries). The index is calculated as a sum of the squares of individual MHT industries' shares in total MHT added value in a country (or their shares in relevant exports) using the following formula:

$$HHI = \sum_{i=1}^{N} (S_i)^2,$$

where:

S_i = share of *i* MHT industry (product) in total MHT value added (total MHT exports);

N = total number of MHT industries in the sample.

The index takes the value $\frac{1}{N}$ to 1, that is, it determines the range from the highest diversification to the greatest concentration of MHT value added and exports in a country's manufacturing sector. The HHI index determines the diversification level of manufacturing production and export structure in total, as well as those industries with high value added.

Table 5 Distribution of diversification of MHT industries (HHI) across the countries[4]

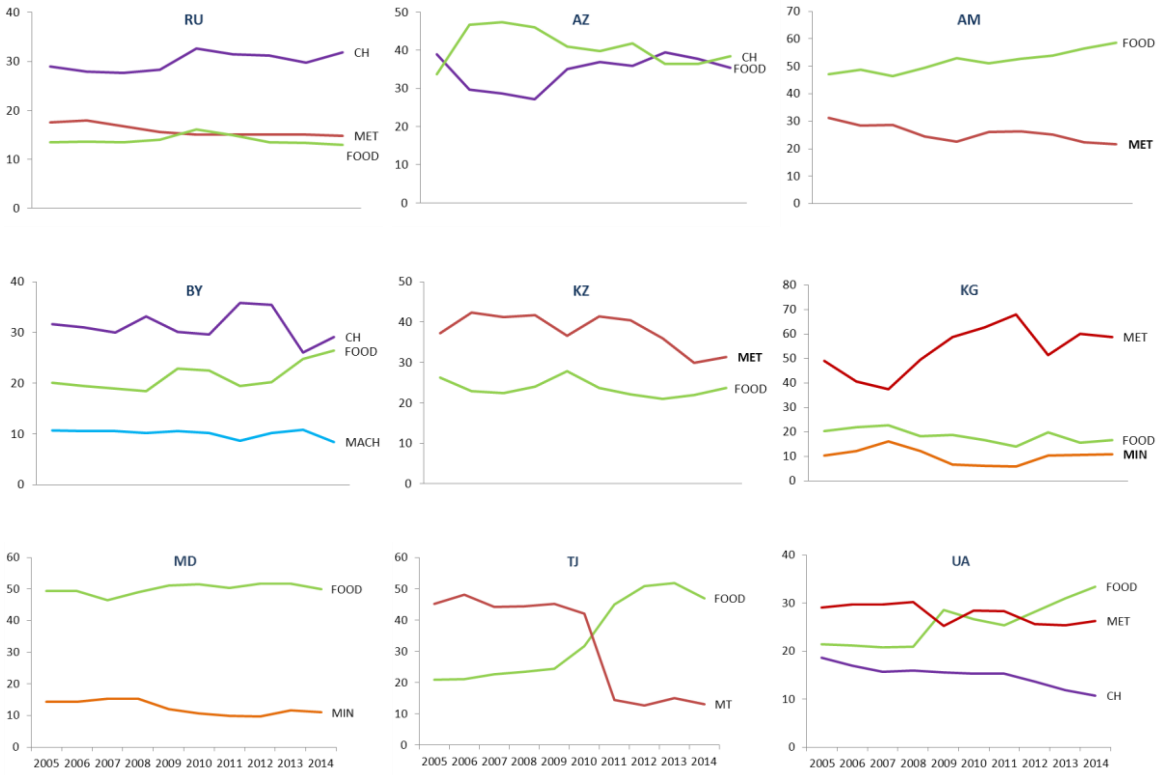
	HHI of MHT production			HHI of MHT exports		
	2005	2009	2014	2005	2009	2014
Russia	0,20	0,25	0,20	0,32	0,34	0,33
Azerbaijan	0,54	0,28	0,25	0,47	0,33	0,51
Armenia	0,37	0,39	0,39	0,24	0,19	0,22
Belarus	0,28	0,29	0,30	0,25	0,30	0,30
Kazakhstan	0,30	0,32	0,26	0,31	0,60	0,38
Kyrgyzstan	0,31	0,30	0,33	0,29	0,22	0,27
Moldova	0,28	0,29	0,37	0,25	0,27	0,37
Tajikistan	0,51	0,79	0,40	0,23	0,50	0,18
Ukraine	0,26	0,25	0,26	0,26	0,22	0,23

Source: Rosstat, CIS STAT, authors' calculations.

Figures 13 and 14 illustrate another aspect of diversification for the CIS region – the basic share in distribution of the top industries with high value added in production and export. The following pattern emerges: the lower the share of such industries but the higher their total contribution to MVA, the more diversified the MVA structure is; the lower the number of industries presented in the figures, the higher the country's manufacturing concentration. Figures 15 and 16 depict the distribution of MVA and manufactured exports across the top industries over 2005-2014, showing that the volatility of these industries changed and illustrating their impact on the basic parameters of production and export development.

[4] In the study, the minimum level of diversification is: $1/N$=1/8=0,125.

Figure 13 MVA distribution across high value added industries (in %)[5]



Note: FOOD – manufacture of food products, beverages and tobacco products; CH – manufacture of chemicals and chemical products; MET – manufacture of basic metals and fabricated metal products; MIN – manufacture of other non-metallic mineral products; MACH – manufacture of machinery and equipment.

Source: Rosstat, CIS STAT, authors' calculations.

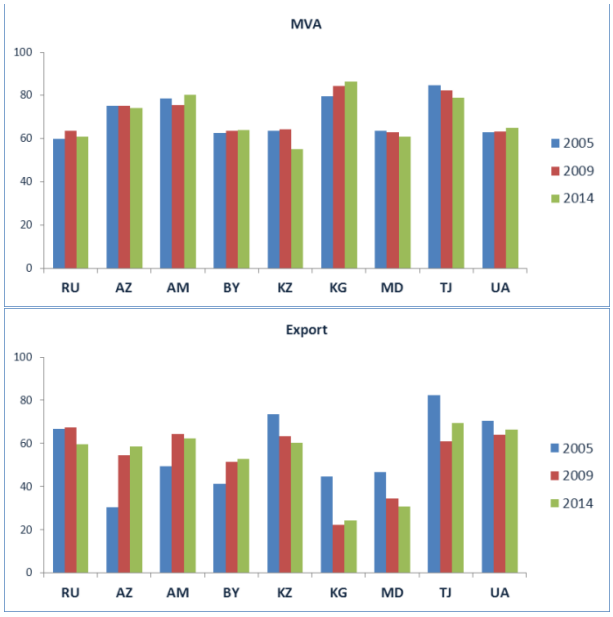
[5] Identifying groups of high value-added industries in each CIS country is based on the authors' empirical estimates by ranking industries in each country and establishing threshold values in the structure of contributions to total regional MVA.

Figure 14 Distribution of manufactured exports across high value added industries

Note: FOOD – manufacture of food products, beverages and tobacco products; CH – manufacture of chemicals and chemical products; MET – manufacture of basic metals and fabricated metal products; MIN – manufacture of other non-metallic mineral products; MACH – manufacture of machinery and equipment.

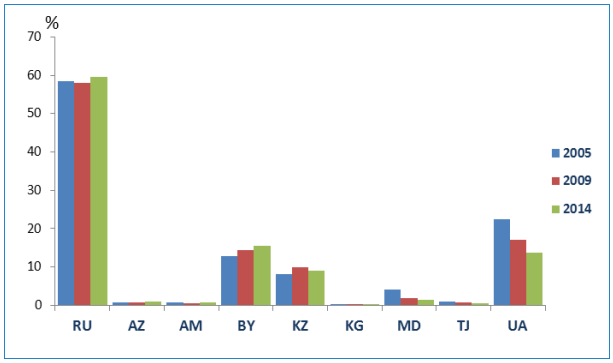
Source: Rosstat, CIS STAT, UNCTADstat database, authors' calculations.

Figure 15 **Change in total share of all high value added industries in MVA and manufactured exports**



Source: Rosstat, CIS STAT, UNCTADstat database, authors' calculations.

Figure 16 **Change in total share of all highly export-oriented manufacturing industries of each country in total (CIS) manufactured exports**



Source: Rosstat, CIS STAT, UNCTADstat database, authors' calculations.

In the period analysed, the top manufacturing industries in the CIS region were represented by five activities only. The value added of basic metals and fabricated metal products developed most dynamically in Russia, Ukraine, Kazakhstan, Tajikistan and Kyrgyzstan. Chemical production only played a significant role in Belarus, Russia and Ukraine. Food production was the most widespread industrial activity in the region; it represented a major share in the MVA of Armenia, Azerbaijan, Moldova, Belarus and (to a lesser extent) of Russia, Ukraine, Kazakhstan, Kyrgyzstan and Tajikistan. Machinery and equipment dominated the MVA only in Belarus and – with a lower contribution – in Russia. Other non-metallic mineral products played an important

part in Kyrgyzstan and Moldova. At the same time, the export potential of the CIS region was largely represented by basic metals and fabricated metal products from Russia, Ukraine, Kazakhstan, Azerbaijan, Armenia, Tajikistan and Kyrgyzstan, as well as by food products from all CIS countries, with a strong dominance in the export baskets of Azerbaijan, Moldova and Armenia. Chemical products from Russia, Belarus and Ukraine were competitive on foreign markets. The export market of machinery and equipment was mostly represented by products from Russia and Belarus.

Table 5 presents the diversification level of each country's industrial exports in the context of manufacturing production competitiveness and patterns of cross-border demand in the regional CIS markets.

Table 6 Manufactured product diversification index across the CIS countries

	MPDI			Changes, 2005-2014
	2005	2009	2014	
Russia	0,81	0,78	0,78	
Azerbaijan	0,39	0,50	0,45	
Armenia	0,57	0,65	0,58	
Belarus	0,59	0,63	0,70	
Kazakhstan	0,70	0,73	0,71	
Kyrgyzstan	0,33	0,48	0,59	
Moldova	0,42	0,46	0,49	
Tajikistan	0,56	0,74	0,58	
Ukraine	0,88	0,85	0,79	

Source: Rosstat, CIS STAT, UNCTADstat database, authors' calculations.

Box 6 Manufactured product diversification index (MPDI)

The manufactured product diversification index (MPDI) helps analyse the manufacturing structure together with the changes in the manufactured exports structure of a given region (or the world as a whole). This index reveals the extent to which a country's economy depends on exports of particular products in the light of shifts in regional industrial exports, and is calculated using the following formula:

$$MPDI_j = 1 - \frac{\sum(|h_{ij} - h_i|)}{2}$$

where:

$MPDI_j$ = manufactured product diversification index value of country *j*;

h_{ij} = share of industry *i* in total manufactured exports of country *j*;

h_i = share of industry *i* of all countries in total (regional) manufactured exports.

$MPDI_j$ dynamics for each country *j* shows a change in the distance (convergence, divergence) between the export structure of a given country and the regional (global) export structure: a decrease in the index value indicates both the lower level of export diversification and the increase in discrepancies between the national and regional (global) manufactured export structure.

Indicators of manufactured export diversification (concentration) help identify those country group with a more pronounced diversification of export-oriented manufacturing industries and with a higher conformity with the regional export pattern (in 2014): Russia, Ukraine, Belarus and Kazakhstan. In other CIS countries, export absorbed a considerably smaller share of the regional value of manufactured exports and was spread across a relatively small number of foreign markets.

Thus, based on the distribution of size and pace of change of MVA technological content across the CIS countries at the end of the period analysed, we can conclude that structural transformation towards the long overdue intensive upgrading was particularly critical for Russia, Belarus, Kazakhstan, Ukraine and Azerbaijan. For the countries with lower manufacturing capacities and a dominant agriculture and services sector and trade in the context of premature de-industrialization, a sluggish classical industrialization became more relevant – with the expansion of MVA share in GDP by moving surplus labour mainly to RB industries.

If we compare the changes over time in upgrading capacity and industrial capacity as a whole, we find a clear link between them in various economies. In countries that experienced

sustainable growth or had a significant MHT contribution to MVA, the MVA per capita increased steadily. The level of industrial development in these countries was largely driven by upgrading potential. That is, in the CIS countries that have traditionally constituted the industrial centre – Russia, Belarus and Kazakhstan – MHT represented a significant share of value added, but countries in which manufacturing development was catching up were characterized by an expansion of low-tech and labour-intensive industries.

It should be noted that between 2005 and 2014, the technological structure did not change in the region. The share of exported MHT products from the CIS' industrial centre (Russia, Belarus, Kazakhstan) in the overall manufactured exports of these countries rose from 34.3 per cent to 38.2 per cent and amounted to US$ 60.7 billion, while those from peripheral CIS countries fell from 27.3 per cent to 26.0 per cent and accounted for US$ 11.3 billion.

Technological upgrading in the CIS region was characterized by discontinuity in the period analysed. It did not contribute to any changes in these economies' specialization, and was mostly characterized by technologically updating individual industries that were largely oriented towards domestic markets. Uneven sluggish modernization in the CIS countries intensified the disproportions of industrial and economic regional inequalities and impeded the sustainable development of regional integration as a whole.

In the majority of CIS countries, manufacturing upgrading still implied an adaptive approach, i.e. implementation of borrowed technologies and assembly production were preferred. The innovations developed in the given country were not competitive in international markets and were not capable of generating income, even though they attracted national resources and foreign investment. With growing national incomes per capita and industrial capacities, rational upgrading was pursued. This reinforced the national innovative potential but was more costly, especially in terms of increasing human and technological capital in total factor productivity. However, such shifts towards adaptive upgrading represent an obstacle to rational upgrading.

6.2 Employment

Structural changes in the economy are characterized, above all, by its ability to continually generate new fast-growing activities with higher value added and productivity as well as to increase returns to scale [UNIDO, 2013b].

Box 7 Manufacturing employment in the CIS region over 2005-2014

In 2014, total manufacturing employment in the CIS-9 region amounted to 5.6 per cent of the region's total population.

At the end of the period analysed, manufacturing employed 14 million people in the CIS region, accounting for 0.41 per cent of the world's working population.

Since 2005, manufacturing employment in countries with an above average national income per capita (Russia, Azerbaijan, Belarus, Kazakhstan) has decreased, amounting to 12 million persons in 2014, which was still 6 times higher than manufacturing employment in countries with a middle national income (Ukraine, Armenia, Moldova) , 51 times higher than in low-income countries (Kyrgyzstan, Tajikistan).

Employment in the top-5 manufacturing industries (export-oriented and with a high value added) in the CIS declined by 23 per cent over the last decade and amounted to 5.3 million persons in 2014.

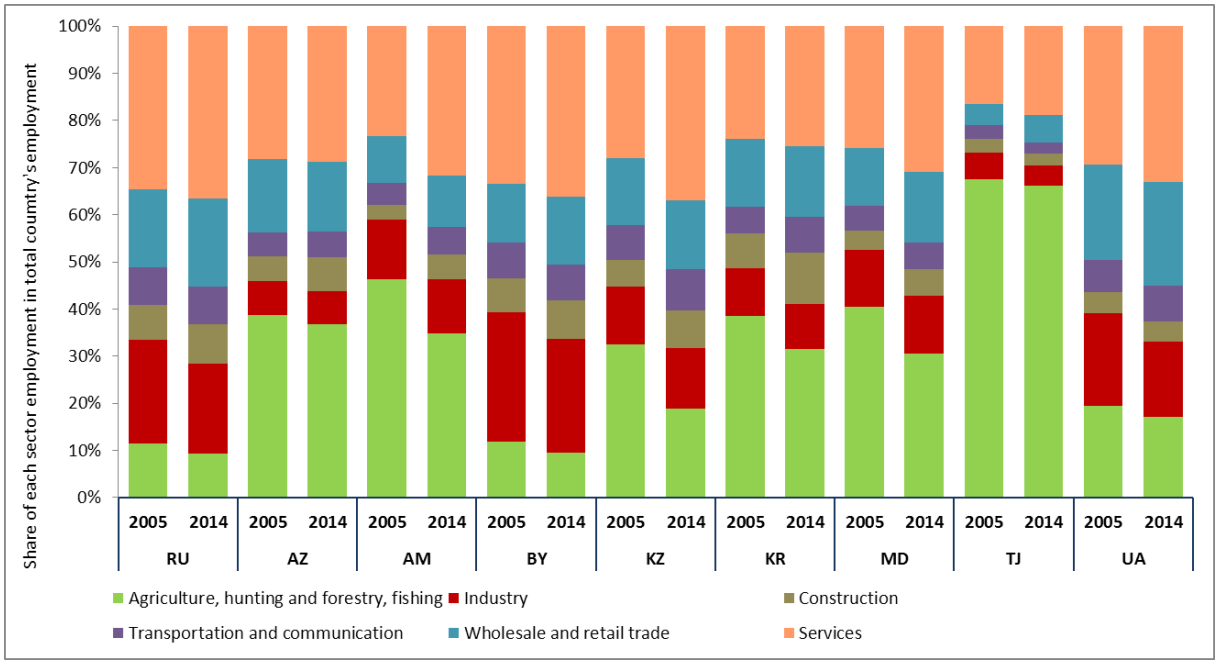
In MHT manufacturing activities, regional employment decreased by 23 per cent over the decade and amounted to 4.4 million persons; it accounted for 32 per cent of all manufacturing employment in the CIS.

In the countries with the highest industrial capacity per capita (Russia, Kazakhstan, Belarus), MHT employment decreased by 20 per cent from 2005 and accounted for 3.7 million persons by 2014, while MHT employment in similar industries in the other countries amounted to only 0.7 million persons.

In countries with dominant RB industries (Armenia, Moldova, Tajikistan), employment was 81.000 persons, accounting for 29 per cent of all manufacturing employment in these countries; in the countries with a representative contribution of LT industries in total MVA (Russia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Ukraine), 3.2 million persons (24 per cent) were employed.

The concept of economic development is inseparably linked to the structural transformation of economic activity that takes place in countries as their national incomes per capita grow.

Figure 17 Changes in employment composition across economic sectors

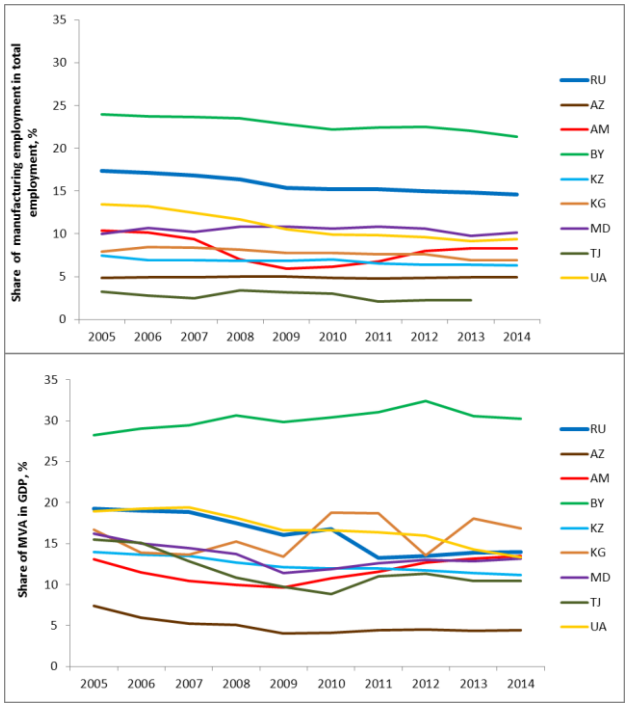


Note: Latest available information for Tajikistan – 2013.

Source: calculation based on the CIS Statistical Committee data (Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Moldova and Ukraine – on the labour force survey; Russia, Belarus and Tajikistan – on the balances of labour resources).

Over the period analysed, no significant progress in the expansion of formal manufacturing employment was evident in the CIS region. The increasing importance of manufacturing as a source of new jobs was not reflected in the CIS; this follows from the distribution across the shares of sectoral jobs in total employment (see Figure 17). The main reason was a lack of visible structural transformation of the national economies in terms of significant shifts towards creating new manufacturing industries with a priori higher value added.

Figure 18 Structural changes in MVA and manufacturing employment



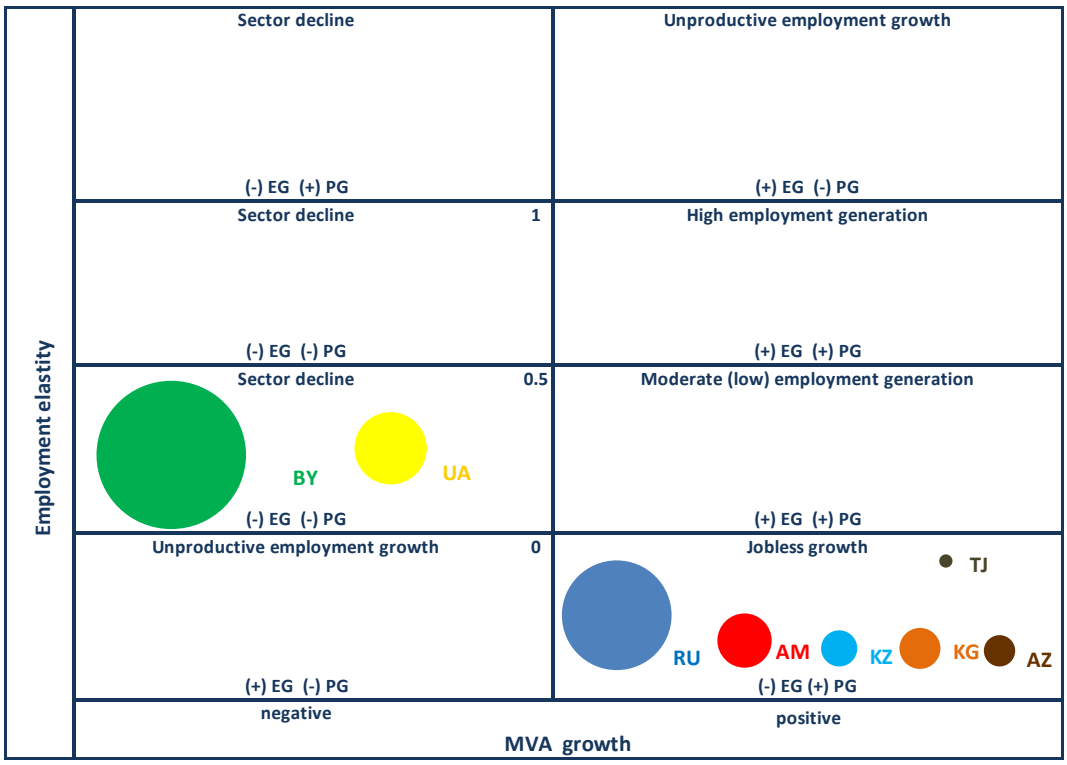
Source: Rosstat, CIS STAT, UNCTADstat database, authors' calculations.

We examined the regional structural changes in manufacturing in terms of employment flows and jobs relocation from other sectors, and simultaneously analysed the dynamics of industrial contribution to total employment in each country. The high level of manufacturing employment (more than 18 per cent) as one of the signs of real and timely industrialization was only observed in Russia, Belarus and Ukraine (see Figure 18). Kazakhstan is considered a country with high industrial potential and is at an earlier industrialization stage in terms of labour movement in the economy. This can largely be explained by the country's traditional economic model which relies on agriculture; the contribution of the agriculture sector to total employment declined in 2014, but primarily because employees relocated to the services sector. Most jobs in Tajikistan, Armenia, Azerbaijan, Kyrgyzstan and Moldova are still found in agriculture; noticeable flows of agriculture employees were mainly absorbed by the services sector (Armenia, Moldova) and the construction and transport sectors (Kyrgyzstan).

The employment elasticity values describe the average annual growth of new jobs created due to the manufacturing growth rate; however, they do not reflect the impact on employment due to the creation of technology- and capital-intensive, labour-saving industries.

The scheme in Figure 19 positions all CIS countries according to their ratio of employment elasticity (less than 0, from 0 to 0.5, from 0.5 to 1 and greater than 1) and the negative/positive compound annual growth rate of MVA [Kapsos, 2005].

Figure 19 **Countries' positions according to their employment elasticity index and MVA compound annual growth rate**



Notes: EG is employment growth, PG is productivity growth; the country's marker size is determined by the share of manufacturing employment in total employment of a country in 2014.

Source: Rosstat, CIS STAT, authors' calculations.

The industries with clearly increasing MVA volumes can be distinguished in most countries; nevertheless, sectoral employment indicates rather different trends over the decade, irrespective of the country's industrial capacity and national income per capita. Russian manufacturing employment in technologically advanced industries shrank rapidly while MVA increased slowly. In RB industries, a common downward trend was observed both in MVA and employment average annual growth. In Azerbaijan, the RB value added expanded noticeably along with employment growth; however, in LT and MHT industries, MVA increased much more intensively while employment reduced markedly. In Belarus, the decrease in the employment rate was significantly lower than that of MVA. MVA growth was so substantial in Kazkhstan's MHT industries that it did not lead to a reduction in employment; employment only decreased in LT industries while LT's value added increased. Kyrgyzstan witnessed resource-based MVA expansion in association with a significant rise in the employment growth rate despite a reduction in the number of jobs in the fast-growing LT activities. In Tajikistan, the low MVA levels correlated with the growth rate in employment; the large-scale expansion of RB industries did not contribute to the employment growth. In Ukraine's manufacturing sector, MVA

reduction was higher than the decrease in jobs.

The value added growth and low negative elasticity in LT industries were most pronounced in Russia, Kyrgyzstan, Kazakhstan, Belarus and Azerbaijan. This tendency indicates an increase in labour productivity while the amount of value added was clearly insufficient to prevent a rise in unemployment.

Thus, an industrial sector can only be an important driver of inclusive economic development if it steadily integrates into the national economy in accordance with production factors other than unproductive employment, low productivity and declining value added. It is essential to keep in mind that manufacturing structural transformation aimed (in the long term) at an increase in value added based on the development of MHT industries must correspond to the national standard of living and workers' skills. Even though there are good reasons to promote technologically sophisticated activities, it is at the same time also necessary to create suitable proportions between manufacturing industries. Such proportions should foster job creation for the majority of the working population and establish a balance of supply and demand for skilled labour. Only those structural changes that promote intensive economic growth and contribute to the absorption of redundant labour are positive for the country.

6.3 Industrial greening

The success of many CIS countries in reducing emissions (see Figure 20) can be explained not only by the high effectiveness of the national strategies, but also by the general trajectory of the countries' cyclic economic development, which is generally characterized in the CIS by premature de-industrialization and a rather moderate expansion of industrial activity.

The CIS countries with the highest industrial potential (presented in the left part of Figure 20) also had the highest industrial emissions into the atmosphere; the ratio of emissions to GDP per capita amounted to 29,000 tonnes/US$ in 2014 compared to 0.2 tonnes/US$ 1,000 in the other CIS countries.

Box 8 Region-wide trends in CIS

Over the period examined, the overall industrial emission of air pollutants into the atmosphere[6] decreased by 14 per cent to 25 million tonnes in the CIS economies.

The level of industrial carbon dioxide emissions by 1,000 sq. km of CIS territory declined by 22 per cent from 2005 and amounted to 311 tonnes per 1,000 population – 23 per cent and 27 tonnes, respectively.

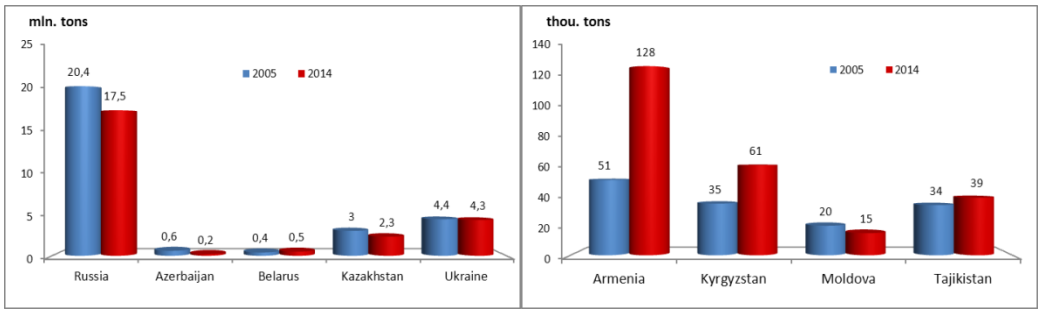
Over 2005-2014, regional GDP per capita grew by 26 per cent to US$ 8,000, while emissions intensity measured as the ratio of emissions to GDP per capita declined substantially and amounted to 3.2 tonnes/ 1,000 US$ by 2014.

The most environmentally sound industrialization in the region with minimal industrial emissions per industrial value added occurred in Moldova and Azerbaijan; Ukraine was the country with the least environmentally sound industrial development in the region.

The industrial value added per 1,000 population of countries with an above average national income (Azerbaijan, Belarus, Kazakhstan, Russia) expanded by 8 per cent from 2005, while the total emissions per 1,000 population reduced by 18 per cent.

In 2014, the greenhouse emissions capacity in the CIS manufacturing sector (as the ratio of carbon emissions to regional GDP) amounted to 0.7 per cent of the global value[7] and reached 0.003 tonnes/US$ 1,000.

Figure 20 Industrial emissions of air pollutants into the atmosphere



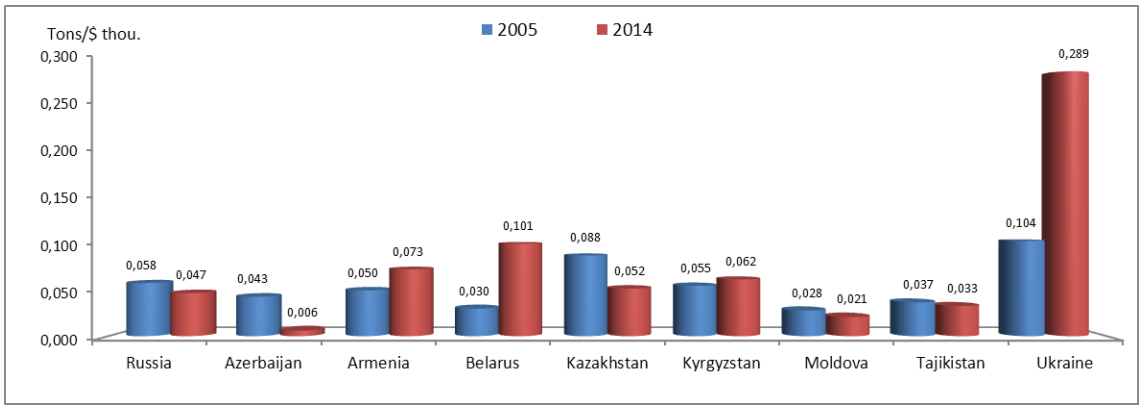
Source: Rosstat, CIS STAT Committee, authors' calculations.

In Russia, Azerbaijan and Kazakhstan, where GDP was growing steadily, the ratio of emissions to industrial value added decreased, indicating a more targeted implementation of environmentally friendly technologies; in 2014, this ratio reached 0.047, 0.006 and 0.052

[6] Emissions of air pollutants from stationary sources; data sources: Rosstat and CIS STAT.
[7] See *Trends in global CO2 emissions* [PBL Netherlands Environmental Assessment Agency and EC, 2015].

tonnes/US$ 1,000, respectively, compared to 0.058, 0.043 and 0.088 tonnes/US$ 1,000 in 2005. In Belarus and Ukraine, the indicator amounted to 0.101 and 0.289 by 2014 versus 0.030 and 0.104 in 2005, respectively. In the other countries, the opposite trend was observed. Industrial emissions in Armenia and Kyrgyzstan in relation to industrial GVA increased considerably (from 0.050 to 0.073 and from 0.055 to 0.062 tonnes/US$ 1,000), while in Moldova, this ratio decreased from 0.028 to 0.021, and in Tajikistan, from 0.037 to 0.033 tonnes/US$ 1,000 (Figure 21).

Figure 21 Industrial emissions per industrial value added



Source: Rosstat, CIS STAT, authors' calculations.

In the period analysed, Russia surpassed the fulfilment of its quantitative commitments to emission reduction pledged within the framework of the Kyoto Protocol, namely to not exceed the emission levels of 1990 by 2012 (about 2.5 million tonnes). However, Russian carbon dioxide emissions per GDP exceeded similar values of all other CIS countries and of many other rapidly developing economies in the world.

The key target of industrial strategies in the CIS region is to proliferate climate policies with a high potential of economically acceptable limits of emissions. Such policies primarily aim at improving industrial energy efficiency, expanding investments in innovation and green technology, creating environmentally friendly jobs and overall climate stability of the economies with transformed markets.

6.4 Integration profiles

Under growing globalization, the processes of regionalization are becoming increasingly standardized; they include the convergence of cross-border states based on their blocks of integration, largely to better participate in foreign markets and strengthen their positions in global value chains. Russia and its neighbouring countries with emerging market economies have been undertaking various efforts to find suitable forms of economic associations. The

establishment of the Commonwealth of Independent States (CIS) was one of the stages of such an integration association.

It should be noted that the CIS countries have great economic potential, which gives them a significant competitive advantage in the international division of producers. These countries (as a whole) cover more than 16 per cent of world territory, have 5 per cent of the world's population, 25 per cent of global natural resources, 10 per cent of resource-based products that are in demand on world markets (oil and natural gas, coal, wood, non-ferrous and rare metals, potash and other minerals, fresh water and land mass, etc.). About 35 per cent of the world's natural gas reserves are concentrated in Russia, and nearly 20 per cent are in Azerbaijan, Turkmenistan, Kazakhstan and Uzbekistan. The explored oil fields in Russia account for about 15 per cent worldwide, and for 10 per cent in Azerbaijan, in Kazakhstan and in Turkmenistan. Total production of hard and brown coal in Russia, Ukraine and Kazakhstan ranks second in the world. A quarter of the world's forests are in the territories of Russia and Belarus. Kazakhstan and Ukraine have large resources of iron ore, bauxite and copper ore. Over 10 per cent of the world's electricity is produced in the CIS; energy resources and a relatively cheap labour force are important conditions for economic growth in most countries [CIS STAT, 2016].

Russia, Belarus, Ukraine and Kazakhstan (the latter with a large gap) held leading positions in terms of export flows of industrial production during the period examined, while import flows played a very important role in Belarus, Kazakhstan, Azerbaijan, Kyrgyzstan and Moldova. A number of CIS economies are particularly interested in integration and interaction for a number of reasons. These include limited access to developed countries' markets due to geographical distance, lack of industrial exports with a significant competitive advantage beyond the region; and economic relations based on investment capital flows from the regional centre.

Box 8 Manufacturing in CIS: convergence or strengthening borders?

In the period analysed, industrial trade flows within the CIS were characterized by strong unevenness and varying diversification levels across the countries. Products from top manufacturing industries with a high value added (basic metals, chemicals, food products, machinery and equipment) constituted a significant part of total exports from and imports to all CIS countries. In 2014, the share of these four commodity positions accounted for 68 per cent of total regional exports (US$ 137 million) and 45 per cent of total regional imports (US$ 172 billion).

Over 2005-2014, the structure of intra-regional flows of industrial exports and imports barely changed and was still fairly unequal across countries, including mutual trade of manufactured

products with Russia. In 2014, export transactions from Russia to Kazakhstan (41.7 per cent), Belarus (27.5 per cent) and Ukraine (19.1 per cent) consistently dominated as did imports to Russia from Belarus (48.8 per cent), Ukraine (35.9 per cent) and Kazakhstan (12.2 per cent).

Mixed trends were observed in the regional integration contributions to total manufactured exports and imports of all CIS countries, including trade with third countries. While intra-regional exports remained stable in the total export flows from all CIS countries (30 per cent or US$ 59.3 billion in 2014), the share of intraregional imports in the countries' total manufactured imports (including from third countries) decreased by 4 per cent to 15.6 per cent and US$ 59.5 billion by 2014.

MHT products represented the most significant share in the overall structure of industrial exports of cross-border CIS integration in 2014 (US$ 23.6 billion or 40 per cent); production of RB industries (US$ 17.5 billion) and LT industries (US$ 18.2 billion) accounted for 31 per cent and 29 per cent, respectively.

MHT products dominated the structure of overall CIS manufactured imports in 2014 (US$ 24.3 billion or 40.7 per cent); RB and LT imports accounted for US$ 16.6 and US$ 18.5 billion (32.4 per cent and 26.9 per cent, respectively).

Over 2005-2014, Russian manufactured exports to the CIS countries with high industrial potential (Kazakhstan, Belarus) grew 2.2 times to US$ 18.8 billion; it was 2.3 times higher than the relevant export flows to other CIS countries. Total industrial imports from these countries to Russia exceeded imports to Russia from other regional countries by 1.6 times, amounting to US$ 15 billion in 2014.

The share of Russian manufactured exports to countries with middle industrial potential (Azerbaijan, Armenia and Ukraine) decreased by 6.7 per cent by 2014; the relevant export volume reached US$ 6.8 billion. Total imports from these countries to Russia increased by 22 per cent and amounted to US$ 9.3 billion.

Russian manufactured exports to CIS countries with low industrial potential (Moldova, Tajikistan, Kyrgyzstan) increased 2.7 times over the period analysed and reached US$ 1.6 billion.

Export flows of Russian MHT products to all CIS countries increased less intensively over the period analysed, amounting to US$ 1.2 billion in 2014, while regional MHT imports to Russia rose to US$ 9.2 billion.

By 2014, the intra-regional manufactured exports structure was still primarily determined by the structure of Russian regional exports, despite the fact that only 22 per cent of total Russian exports were going to CIS countries in 2014.

The import flow structure of Russia and other CIS countries from third countries differed from the export flow structure. In all countries (except Tajikistan), imports from third countries were mainly MHT products. In 2014, the volume of such imports in Russia amounted to US$ 145 billion, in Belarus, Kazakhstan and Ukraine to US$ 8.9, US$ 14.0 and US$ 16.6 billion, respectively. In other countries such imports amounted to US$ 8.4 billion. Tajikistan mainly imported LT products with a total value of US$ 1.2 billion.

Within the CIS region, Belarus, Kazakhstan and Ukraine were the most important mutual trading partners for Russia in the reporting period; the share of these countries accounted for more than 80 per cent of Russian manufactured exports and 90 per cent of similar imports from all CIS countries in cross-border integration.

7 Conclusions

In the period analysed, the trends in the CIS region were largely caused by short-term cyclical factors in each country and a fairly high convergence of GDP growth rates in a number of CIS countries. These trends were not of a systemic nature, that is, they were not attributable to any apparent structural changes in the demand and supply ratio. The negative impact of premature de-industrialization on the countries with an insignificant MVA share in total value added was observed in the countries with low incomes per capita.

In many CIS countries, there was virtually no domestic effective demand to ensure sustainable development of fast-growing industries. Manufacturing activities with highly qualified personnel and significant labour productivity, capable of meeting high demand in foreign markets, steady growth of national incomes and overall performance were nearly absent. The manufacturing composition of the CIS economies put enormous pressure on national competitive development and structural diversification through differences in the countries' technological levels and clear shifts towards LT industries. A number of CIS countries depended increasingly on imports of such resources as capital and intermediate goods.

Our results indicate that there are signs of more confident industrialization and upgrading, and that there are effective industrial, export and integration policies in Kazakhstan, Russia, Belarus, Ukraine and Azerbaijan. For these countries, higher prolonged industrial growth and technological progress are possible.

Russia needs to implement profound structural economic reforms to ensure sustainable and intensive growth of GVA per capita, to find a way out of the vicious cycle of recurring crises caused largely by the country's dependence on commodity prices, and to reduce the negative spillover effects on the CIS economic space.

Improvement in the industrial export quality and structure, as well as the growth of MVA per capita, maintaining a reasonable balance in the national industrial and export capacities – all of these factors would contribute to reducing the gaps in the industrial development of Belarus and other CIS countries which have recently emerged as leaders. The high growth rate of the industrial export capacity in recent years to expand national wealth continues to be still essential for Belarus. The accelerated growth trend in all aggregate indicators of Kazakhstan's industrial development was dominant in the CIS region over the period analysed. Strengthening the current positive sectoral developments should be accompanied by relevant changes in the production and export structures of manufacturing industries aiming to expand their industrial activities with a higher value added.

To overcome the main barriers to manufacturing expansion, Armenia needs to improve its export structure and enhance the competitiveness of its manufactured products in the regional market. The aggregate indicators of Kyrgyzstan's industrial growth, taking into account the modern features of economic development, reflect a stabilization of positive industrial trends, but the country's current MVA per capita does not allow the sector to be a driver of GDP growth. The national competences of Moldova under the industrial policy priorities should strengthen its productive capacity and expand MVA contributions to GDP and exports.

By the end of the period analysed, the need to diversify national economies and exports, as well as to introduce effective economic policies had only increased in the CIS region. These policies need to be balanced between promoting demand and structural reforms aimed at increasing productivity, eliminating barriers to manufacturing development and providing access to foreign markets.

The key areas of industrial policy in the CIS region should vary depending on the level and paces of countries' industrialization and their capabilities to develop various technologies and innovations. They should largely cover the following aspects: property rights protection; tariff setting, tax incentives and subsidies; the distribution of public and private financial resources; lending on a competitive basis; the development of enterprises with state participation and ownership in the sphere of natural monopolies, national security and social orientation; and the development of strategic industries through public procurement.

The production and export policies of all CIS countries need to be reoriented from production and export of labour-intensive products limited by growing competitive pressures to products of higher value added. The latter are largely dependent on each country's ability to replace the imported components with national products and to use domestic sources for growth.

Regional agreements and mutual arrangements for access to technologies, markets, production upgrading, pro-investment regimes, rapid expansion of the range of manufacturing industries involved in foreign trade flows – all of these factors should contribute to the industrial and trade recovery of the CIS countries.

The governments of CIS countries with low incomes and low industrial growth rates need to ensure low entry barriers, especially for labour-intensive and resource-based industries. In the middle-income countries, the focus should lie on increasing efficiency and productivity as well as structural upgrading. The critical targets of industrial development of countries with above average incomes should be to increase the quality of technological innovations, create products and expand industrial activities related to green technologies.

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Appendix

Table A.1 – Structure of total GVA in the countries

	GVA in constant $, million			CAGR (in %)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Russia – in total	**1 010 177**	**1 035 658**	**1 434 543**	**0.5**	**5.6**	**3.6**
Agriculture, hunting and forestry	47 475	47 620	53 985	0.1	2.1	1.3
Fishing	2 283	2 089	2 858	-1.8	5.4	2.3
Mining and quarrying	121 127	101 234	129 835	-3.5	4.2	0.7
Manufacturing	194 336	166 131	200 053	-3.1	3.1	0.3
Electricity, gas and water production and supply	35 960	31 110	45 341	-2.9	6.5	2.3
Construction	55 590	59 917	106 318	1.5	10.0	6.7
Wholesale and retail trade; repair of motor vehicles, motorcycles, personal and household goods	180 211	212 140	251 965	3.3	2.9	3.4
Services	383 265	415 418	644 960	1.6	7.6	5.3
Azerbaijan – in total	**24 042**	**51 155**	**60 349**	**16.3**	**2.8**	**9.6**
Agriculture, hunting and forestry	2 455	2 892	3 347	3.3	2.5	3.1
Fishing	0	0	0	-	-	-
Mining and quarrying	10 501	30 333	26 318	23.6	-2.3	9.6
Manufacturing	1 787	2 054	2 671	2.8	4.5	4.1
Electricity, gas and water production and supply	617	579	845	-1.2	6.5	3.2
Construction	1 956	3 198	7 517	10.3	15.3	14.4
Wholesale and retail trade; repair of motor vehicles, motorcycles, personal and household goods	1 702	2 978	4 914	11.8	8.7	11.2
Services	5 024	9 122	14 737	12.7	8.3	11.4
Armenia – in total	**5 175**	**7 733**	**8 179**	**8.4**	**0.9**	**4.7**
Agriculture, hunting and forestry	1 100	1 460	1 551	5.8	1.0	3.5
Fishing	4,76	0	0	-	-	-
Mining and quarrying	111	144	280	5.2	11.7	9.6
Manufacturing	676	745	1 106	2.0	6.8	5.0
Electricity, gas and water production and supply	228	282	361	4.4	4.2	4.7
Construction	1 089	1 609	1 064	8.1	-6.7	-0.2

	GVA in constant $, million			CAGR (in %)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Wholesale and retail trade; repair of motor vehicles, motorcycles, personal and household goods	683	1 091	1 282	9.8	2.7	6.5
Services	1 283	2 402	2 535	13.4	0.9	7.1
Belarus – in total	**39 549**	**39 776**	**13 227**	**0.1**	**-16.8**	**-10.4**
Agriculture, hunting and forestry	4 281,6	3 975,2	1 267,6	-1.5	-17.3	-11.5
Fishing	45,37	50,21	12,10	2.0	-21.1	-12.4
Mining and quarrying	486,32	421,15	181,70	-2.8	-13.1	-9.4
Manufacturing	11 175	11 857	3 996	1.2	-16.6	-9.8
Electricity, gas and water production and supply	1 837,6	1 330,3	398,4	-6.3	-18.2	-14.2
Construction	2 785,3	4 425,0	1 357,9	9.7	-17.9	-6.9
Wholesale and retail trade; repair of motor vehicles, motorcycles, personal and household goods	4 487,3	4 966,6	2 058,3	2.1	-13.7	-7.5
Services	14 451	12 751	3 955	-2.5	-17.7	-12.2
Kazakhstan – in total	**90 375**	**102 824**	**143 257**	**2.6**	**5.7**	**4.7**
Agriculture, hunting and forestry	5 849	6 481	6 463	2.1	0.0	1.0
Fishing	81	66	0	-3.9	-	-
Mining and quarrying	19 407	21 891	24 913	2.4	2.2	2.5
Manufacturing	12 630	12 455	15 955	-0.3	4.2	2.4
Electricity, gas and water production and supply	1 714	1 803	2 859	1.0	8.0	5.3
Construction	5 894	8 523	10 761	7.7	4.0	6.2
Wholesale and retail trade; repair of motor vehicles, motorcycles, personal and household goods	11 664	13 033	25 040	2.2	11.5	7.9
Services	33 136	38 570	57 264	3.1	6.8	5.6
Kyrgyzstan – in total	**3 283**	**3 918**	**4 485**	**3.6**	**2.3**	**3.2**
Agriculture, hunting and forestry	1 032	1 098	754	1.2	-6.1	-3.1
Fishing	0,09	0,12	0	5.0	-	-
Mining and quarrying	25	25	40	0.1	8.0	4.8
Manufacturing	547	526	757	-0.8	6.3	3.3
Electricity, gas and water production and supply	66	61	182	-1.6	20.1	10.7

	GVA in constant $, million			CAGR (in %)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Construction	138	281	438	15.3	7.7	12.3
Wholesale and retail trade; repair of motor vehicles, motorcycles, personal and household goods	536	733	927	6.4	4.0	5.6
Services	938	1 194	1 387	4.9	2.5	4.0
Moldova – in total	**3 630**	**4 361**	**4 472**	**3.7**	**0.4**	**2.1**
Agriculture, hunting and forestry	492	447	507	-1.9	2.1	0.3
Fishing	1,3	1,9	2,0	8.6	0.8	4.7
Mining and quarrying	19	20	26	1.5	4.8	3.6
Manufacturing	590	499	589	-3.3	2.8	0.0
Electricity, gas and water production and supply	101	112	83	2.0	-4.8	-1.9
Construction	172	205	221	3.6	1.3	2.6
Wholesale and retail trade; repair of motor vehicles, motorcycles, personal and household goods	476	732	830	9.0	2.1	5.7
Services	1 779	2 343	2 213	5.7	-1.0	2.2
Tajikistan – in total	**4 006**	**3 890**	**6 583**	**-0.6**	**9.2**	**5.1**
Agriculture, hunting and forestry	933	938	1 811	0.1	11.6	6.9
Fishing	0	0	4,9	-	-	-
Mining and quarrying	134	82	335	-9.4	26.5	9.6
Manufacturing	619	378	686	-9.4	10.5	1.0
Electricity, gas and water production and supply	178	108	148	-9.4	5.3	-1.8
Construction	410	374	538	-1.8	6.3	2.8
Wholesale and retail trade; repair of motor vehicles, motorcycles, personal and household goods	740	876	1 078	3.4	3.5	3.8
Services	992	1 135	1 983	2.7	9.7	7.2
Ukraine – in total	**142 997**	**95 354**	**65 634**	**-7.8**	**-6.0**	**-7.5**
Agriculture, hunting and forestry	11 331	8 144	7 126	-6.4	-2.2	-4.5
Fishing	0	0	0	-	-	-
Mining and quarrying	9 043	6 072	3 815	-7.7	-7.5	-8.3
Manufacturing	27 104	15 838	8 697	-10.2	-9.5	-10.7

	GVA in constant $, million			CAGR (in %)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Electricity, gas and water production and supply	6 593	3 905	2 472	-9.9	-7.3	-9.3
Construction	7 461	2 601	1 139	-19.0	-12.9	-17.1
Wholesale and retail trade; repair of motor vehicles, motorcycles, personal and household goods	18 201	13 707	9 048	-5.5	-6.7	-6.8
Services	63 265	45 086	33 337	-6.6	-4.9	-6.2

Note: CAGR (Compound Annual Growth Rate) is an average annual growth rate for a specific period.

CAGR is calculated as: $CAGR = \left(\frac{e\square ding\ value}{beginning\ value}\right)^{\left(\frac{1}{number\ of\ years}\right)}$

Source: Rosstat, CIS STAT, authors' calculations.

Table A.2 – Structural change in countries' economic development over 2005-2014

	Coefficient of absolute structural change $d(x)_{abs}$		Coefficient of relative structural change d^2_{rel}		Integral coefficient of structural change d_{int}	
	economy	industry	economy	industry	economy	industry
Russia	2,332	2,767	0,356	0,139	0,107	0,123
Azerbaijan	2,227	1,413	0,912	0,370	0,205	0,224
Armenia	2,603	0,579	1,603	0,348	0,376	0,132
Belarus	2,385	1,245	0,577	0,142	0,130	0,129
Kazakhstan	2,243	2,340	1,329	0,080	0,368	0,090
Kyrgyzstan	3,660	0,796	4,133	1,081	0,416	0,201
Moldova	1,550	1,356	0,451	0,171	0,117	0,136
Tajikistan	2,852	2,993	-	0,623	0,391	0,251
Ukraine	2,635	2,353	0,742	0,131	0,215	0,120

Source: Rosstat, CIS Statistical Committee, authors' calculations, UNIDO recommendations [UNIDO, 2010].

Table A.3 – Share of industrial products in total countries' exports

	Industrial products share in total exports (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Mining and quarrying						
Russia	63.1	63.6	70.7	0.5	7.1	7.5
Azerbaijan	79.1	91.8	92.8	12.8	1.0	13.7
Armenia	5.0	14.5	22.7	9.6	8.2	17.8
Belarus	35.1	37.8	33.8	2.7	-4.0	-1.3
Kazakhstan	75.6	74.9	81.3	-0.7	6.4	5.7
Kyrgyzstan	15.1	4.5	15.6	-10.6	11.2	0.5
Moldova	2.0	1.3	2.2	-0.7	0.9	0.2
Tajikistan	0.8	4.4	8.5	3.6	4.1	7.7
Ukraine	14.7	10.7	11.8	-4.0	1.1	-2.9
Manufacturing						
Russia	26.4	24.2	24.8	-2.2	0.7	-1.5
Azerbaijan	15.6	4.4	5.0	-11.1	0.5	-10.6
Armenia	91.2	80.6	70.2	-10.6	-10.5	-21.0
Belarus	62.1	59.2	61.3	-2.8	2.1	-0.8
Kazakhstan	22.5	23.1	16.7	0.5	-6.4	-5.9
Kyrgyzstan	41.8	35.7	51.3	-6.1	15.6	9.5
Moldova	85.5	73.3	72.8	-12.2	-0.5	-12.8
Tajikistan	76.6	73.6	59.2	-3.0	-14.5	-17.4
Ukraine	78.7	75.0	70.4	-3.7	-4.7	-8.4
Electricity, gas and water supply						
Russia	0.23	0.22	0.15	-0.01	-0.07	-0.08
Azerbaijan	0.44	0.18	0.11	-0.26	-0.07	-0.33
Armenia	2.3	0.5	4.0	-1.80	3.44	1.63
Belarus	0.13	0.00	0.10	-0.13	0.10	-0.03
Kazakhstan	0.14	0.09	0,14	-0,05	0.05	0.0004
Kyrgyzstan	3.9	3.8	3.2	-0.11	-0.60	-0.71
Moldova	0.0	0.9	0.0	0.82	-0.86	-0.04
Tajikistan	6.7	4.0	2.3	-2.72	-1.65	-4.37
Ukraine	0.5	0.6	0.9	0.06	0.32	0.38

Source: UNCTADstat database, authors' calculations.

Table A.4 – Industrial production capacity

	Industrial GVA per capita (in constant $)			CAGR (in %)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Mining and quarrying						
Russia	844	709	902	-3.4	4.1	0.7
Azerbaijan	1235	3390	2760	22.4	-3.4	8.4
Armenia	34,6	44,3	92,8	5.1	13.1	10.4
Belarus	50,3	44,3	19,2	-2.5	-13.0	-9.2
Kazakhstan	1281	1360	1441	1.2	1.0	1.2
Kyrgyzstan	4,8	4,7	6,9	-0.7	6.6	3.5
Moldova	5,2	5,6	7,4	1.6	4.9	3.7
Tajikistan	19,8	11,1	40,6	-10.8	24.0	7.5
Ukraine	193	132	89	-7.2	-6.4	-7.4
Manufacturing						
Russia	1354	1163	1389	-3.0	3.0	0.3
Azerbaijan	210	230	280	1.8	3.4	2.9
Armenia	210	230	367	1.8	8.1	5.7
Belarus	1156	1247	422	1.5	-16.5	-9.6
Kazakhstan	834	774	923	-1.5	3.0	1.0
Kyrgyzstan	106	98	130	-1.6	4.8	2.0
Moldova	165	140	166	-3.2	2.9	0.1
Tajikistan	91	51	83	-10.8	8.3	-0.9
Ukraine	578	345	203	-9.8	-8.5	-9.9
Electricity, gas and water supply						
Russia	250,6	217,9	314,9	-2.8	6.3	2.3
Azerbaijan	72,6	64,7	88,6	-2.3	5.4	2.0
Armenia	70,8	86,9	119,6	4.2	5.5	5.4
Belarus	190,1	139,9	42,1	-5.9	-18.2	-14.0
Kazakhstan	113,1	112,0	165,4	-0.2	6.7	3.9
Kyrgyzstan	12,8	11,3	31,2	-2.5	18.5	9.4
Moldova	28,3	31,3	23,4	2.0	-4.7	-1.9
Tajikistan	26,2	14,8	17,9	-10.8	3.2	-3.8
Ukraine	140,5	85,1	57,7	-9.5	-6.3	-8.5

Source: Rosstat, CIS STAT, the authors' calculations.

Table A.5 – Industrial export capacity

	Industrial export per capita (in current $)			CAGR (in %)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Mining and quarrying						
Russia	1062	1345	2443	4.8	10.5	8.7
Azerbaijan	711	2165	2750	24.9	4.1	14.5
Armenia	14,4	30,7	112,5	16.2	24.2	22.8
Belarus	581	847	1286	7.8	7.2	8.3
Kazakhstan	1396	2016	3707	7.6	10.7	10.3
Kyrgyzstan	19,7	13,9	43,8	-6.7	21.0	8.3
Moldova	6,2	4,8	14,8	-5.0	20.7	9.1
Tajikistan	1,1	5,9	10,9	40.7	10.7	26.0
Ukraine	107	92	149	-2.9	8.2	3.3
Manufacturing						
Russia	444	511	859	2.8	9.1	6.8
Azerbaijan	140	105	148	-5.7	5.9	0.5
Armenia	266	170	347	-8.5	12.6	2.7
Belarus	1026	1327	2335	5.3	9.9	8.6
Kazakhstan	416	621	760	8.3	3.4	6.2
Kyrgyzstan	54	111	144	15.3	4.4	10.2
Moldova	261	264	479	0.2	10.4	6.3
Tajikistan	101	100	76	-0.2	-4.4	-2.8
Ukraine	574	649	886	2,5	5.3	4.4
Electricity, gas and water supply						
Russia	3,8	4,6	5,1	3.9	1.7	2.9
Azerbaijan	3,9	4,1	3,2	1.1	-4.4	-2.2
Armenia	6,8	1,1	19,6	-30.2	61.0	11.2
Belarus	2,2	0,05	3,9	-53.8	109.8	6.0
Kazakhstan	2,7	2,5	6,6	-1.0	17.3	9.5
Kyrgyzstan	5,1	11,7	8,9	18.3	-4.5	5.8
Moldova	0,1	3,1	0,0	90.5	-70.0	-33.0
Tajikistan	8,8	5,4	3,0	-9.4	-9.4	-10.3
Ukraine	3,8	5,0	11,3	5.6	14.6	11.6

Source: UNCTADstat database, authors' calculations.

Table A.6 – Countries' impact on regional (CIS) MVA

	Share in total MVA of CIS (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Russia	77,90	78,93	85,31	1.03	6.38	7.41
Azerbaijan	0,72	0,98	1,14	0.26	0.16	0.42
Armenia	0,27	0,35	0,47	0.08	0.12	0.20
Belarus	4,48	5,63	1,70	1.15	-3.93	-2.78
Kazakhstan	5,06	5,92	6,80	0.85	0.89	1.74
Kyrgyzstan	0,22	0,25	0,32	0.03	0.07	0.10
Moldova	0,24	0,24	0,25	0.001	0.01	0.02
Tajikistan	0,25	0,18	0,29	-0.07	0.11	0.04
Ukraine	10,86	7,52	3,71	-3.34	-3.82	-7.16

Source: Rosstat, CIS STAT, authors' calculations.

Table A.7 – Countries' impact on regional (CIS) manufactured exports

	Share in total manufactured export of CIS (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Russia	57,47	56,49	61,07	-0.98	4.58	3.60
Azerbaijan	1,08	0,73	0,70	-0.35	-0.03	-0.38
Armenia	0,77	0,43	0,52	-0.34	0.09	-0.25
Belarus	8,95	9,78	10,92	0.83	1.15	1.97
Kazakhstan	5,69	7,74	6,49	2.05	-1.26	0.79
Kyrgyzstan	0,25	0,46	0,41	0.21	-0.05	0.16
Moldova	0,84	0,73	0,84	-0.11	0.11	0.00
Tajikistan	0,62	0,57	0,31	-0.05	-0.26	-0.31
Ukraine	24,32	23,08	18,74	-1.25	-4.34	-5.59

Source: UNCTADstat database, authors' calculations.

Table A.8 – Classification of industrial activities by technological structure

	Russia	Azerbaijan	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Moldova	Tajikistan	Ukraine
Resource-based industries									
Manufacture of food products, beverages and tobacco products	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**
Manufacture of wood and of products of wood and cork, except furniture	x	x	x	x	x	x	x	x	
Manufacture of pulp, wood pulp, paper, cardboard and paper products	x								
Manufacture of wood and paper products; publishing and printing				x		x	x	x	x
Manufacture of other non-metallic mineral products	x	x	x	x	**XX**	**XX**	**XX**	x	
Low-tech industries									
Manufacture of textiles	x	x			x		x		
Manufacture of wearing apparel; dressing and dyeing of fur	x	x			x		x		
Manufacture of textiles, wearing apparel; dressing and dyeing of fur			x	x		x		x	
Tanning and dressing of leather; manufacture of leather products and footwear	x	x	x	x	x	x	x	x	
Manufacture of textiles, wearing apparel; leather and leather products, footwear									x
Publishing, printing and reproduction of recorded media	x	x	x				x		
Manufacture of coke and refined petroleum products	**XX**	x		x	x	x			x
Manufacture of rubber and plastics products	x	x	x	x	x	x	x	x	
Manufacture of rubber and plastics products; other									x

	Russia	Azerbaijan	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Moldova	Tajikistan	Ukraine
non-metallic mineral products									
Manufacture of basic metals	**XX**	x			**XX**		x		
Manufacture of fabricated metal products, except machinery and equipment	x	x			x		x		
Manufacture of basic metals; fabricated metal products, except machinery and equipment			**XX**	x		**XX**		**XX**	**XX**
Manufacture of furniture; manufacturing n.e.c.	x								
Other manufacture	x	x	x	x	x	x	x	x	x
Medium- and high-tech industries									
Manufacture of chemicals and chemical products	**XX**	**XX**	x	**XX**	x	x	x	x	**XX**
Manufacture of machinery and equipment	x			**XX**		x	x	x	
Manufacture of office, accounting and computing machinery	x								
Manufacture of electronic components; radio, television and communication equipment and apparatus	x						x		
Manufacture of medical, precision and optical instruments, photographic equipment, watches and clocks	x						x		
Manufacture of computers, electronic and optical equipment; manufacture of electrical machinery and apparatus				x	x	x		x	x
Manufacture of computers, electronic and optical equipment		x	x						
Manufacture of electrical machinery and apparatus	x	x	x		x		x		x
Manufacture of machinery		x	x		x				

	Russia	Azerbaijan	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Moldova	Tajikistan	Ukraine
and equipment n.e.s.									
Manufacture of motor vehicles, trailers and semi-trailers	x	x			x				
Building of ships and boats; manufacture of air and spacecraft; manufacture of other transport equipment	x								
Manufacture of other transport equipment		x	x						
Manufacture of transport equipment				x		x			x

Notes: Extended presentation of manufacturing activities across the countries caused by differences in classification of industrial activities, need to consider all possible technological manufactures throughout all CIS countries.

The sign "**XX**" denotes manufacturing industries with high MVA.

Table A.9 – Industries contribution to the total country's manufactured exports

3	Share of branches in manufactured export (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Russia						
Manufacture of food products, beverages and tobacco products	3.84	7.68	9.01	3.8	1.3	5.2
Manufacture of textiles	0.70	0.36	0.40	-0.3	0.0	-0.3
Manufacture of wearing apparel	0.30	0.14	0.33	-0.2	0.2	0.0
Tanning and dressing of leather; manufacture of leather products and footwear	0.32	0.23	0.39	-0.1	0.2	0.1
Manufacture of wood and of products of wood and cork, except furniture	4.27	4.63	4.06	0.4	-0.6	-0.2
Manufacture of chemicals and chemical products (excluding gunpowder and explosives)	17.21	18.37	20.00	1.2	1.6	2.8
Manufacture of rubber and plastics products	1.02	1.30	1.45	0.3	0.2	0.4
Manufacture of pulp, wood pulp, paper, cardboard and paper products	3.37	3.32	3.54	0.0	0.2	0.2
Publishing, printing and reproduction of recorded media	0.51	0.48	0.36	0.0	-0.1	-0.2
Manufacture of other non-metallic mineral products	3.61	2.94	5.43	-0.7	2.5	1.8
Manufacture of basic metals	45.74	41.29	30.68	-4.4	-10.6	-15.1

3	Share of branches in manufactured export (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Manufacture of fabricated metal products, except machinery and equipment	1.64	1.87	1.44	0.2	-0.4	-0.2
Manufacture of machinery and equipment (excluding weapons and ammunition)	6.81	7.50	6.18	0.7	-1.3	-0.6
Manufacture of office and accounting machinery	0.13	0.29	1.49	0.2	1.2	1.4
Manufacture of electronic components; radio, television and communication equipment and apparatus	0.74	1.14	1.46	0.4	0.3	0.7
Manufacture of electrical machinery and apparatus	1.87	2.29	2.32	0.4	0.0	0.4
Manufacture of medical, precision and optical instruments, photographic equipment, watches and clocks	1.08	1.32	1.13	0.2	-0.2	0.0
Manufacture of motor vehicles, trailers and semi-trailers	3.12	2.23	2.58	-0.9	0.3	-0.5
Building of ships and boats; manufacture of air and spacecraft; manufacture of other transport equipment	2.79	1.45	2.18	-1.3	0.7	-0.6
Manufacture of furniture; manufacturing n.e.c.	0,94	1,17	5,55	0,2	4,4	4,6
RB	15.1	18.6	22.0	3.5	3.5	7.0
LT	51.2	46.8	40.6	-4.3	-6.2	-10.6
MHT	33.7	34.6	37.3	0.8	2,.8	3.6
Azerbaijan						
Manufacture of food products, beverages and tobacco products	16.38	32.96	45.04	16.6	12.1	28.7
Manufacture of textiles	2.24	3.77	2.74	1.5	-1.0	0.5
Manufacture of wearing apparel	0.52	0.53	0.21	0.0	-0.3	-0.3
Tanning and dressing of leather; manufacture of leather products and footwear	0.17	0.49	1.23	0.3	0.7	1.1
Manufacture of wood and of products of wood and cork, except furniture	0.79	0.06	0.08	-0.7	0.0	-0.7
Manufacture of pulp, wood pulp, paper, cardboard and paper products	0.33	0.23	0.46	-0.1	0.2	0.1
Manufacture of other non-metallic mineral products	0.41	0.41	0.43	0.0	0.0	0.0
Publishing, printing and reproduction of recorded media	0.19	0.17	0.06	0.0	-0.1	-0.1

3	Share of branches in manufactured export (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Manufacture of chemicals and chemical products	14.59	12.32	20.11	-2.3	7.8	5.5
Manufacture of rubber and plastics products	0.63	0.34	0.08	-0.3	-0.3	-0.5
Металлургическое производство	13.86	21.53	13.59	7.7	-7.9	-0.3
Manufacture of basic metals	0.47	0.76	0.41	0.3	-0.3	-0.1
Manufacture of fabricated metal products, except machinery and equipment	4.73	5.32	4.54	0.6	-0.8	-0.2
Manufacture of office and accounting machinery	0.06	0.10	0.08	0.0	0.0	0.0
Manufacture of electronic components; radio, television and communication equipment and apparatus	0.15	0.25	0.20	0.1	-0.1	0.1
Manufacture of electrical machinery and apparatus	0.55	0.62	1.41	0.1	0.8	0.9
Manufacture of motor vehicles, trailers and semi-trailers	0.57	0.51	0.71	-0.1	0.2	0.1
Building of ships and boats; manufacture of air and spacecraft; manufacture of other transport equipment	39.46	14.80	0.94	-24.7	-13.9	-38.5
Manufacture of medical, precision and optical instruments, photographic equipment, watches and clocks	1.62	1.19	1.03	-0.4	-0.2	-0.6
Manufacture of furniture; manufacturing n.e.c.	2.29	3.63	6.65	1.3	3.0	4.4
RB	1790	33.67	46.01	15.8	12.3	28.1
LT	20.4	31.2	25.0	10.9	-6.2	4.6
MHT	61.7	35.1	29.0	-26.6	-6.1	-32.7
Armenia						
Manufacture of food products, beverages and tobacco products	13.24	20.02	34.95	6.8	14.9	21.7
Manufacture of textiles	0.50	0.79	0.04	0.3	-0.8	-0.5
Manufacture of wearing apparel	3.14	2.27	6.19	-0.9	3.9	3.1
Tanning and dressing of leather; manufacture of leather products and footwear	0.01	0.25	0.21	0.2	0.0	0.2
Manufacture of wood and of products of wood and cork, except furniture	0.09	0.06	0.03	0.0	0.0	-0.1
Manufacture of pulp, wood pulp, paper, cardboard and paper products	0.36	0.17	0.14	-0.2	0.0	-0.2

3	Share of branches in manufactured export (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Publishing, printing and reproduction of recorded media	0.37	0.12	0.07	-0.3	0.0	-0.3
Manufacture of chemicals and chemical products	1.14	2.59	2.01	1.5	-0.6	0.9
Manufacture of rubber and plastics products	0.11	0.19	0.18	0.1	0.0	0.1
Manufacture of other non-metallic mineral products	31.73	14.56	13.41	-17.2	-1.2	-18.3
Manufacture of basic metals	36.21	44.30	27.18	8.1	-17.1	-9.0
Manufacture of fabricated metal products, except machinery and equipment	1.71	0.19	0.41	-1.5	0.2	-1.3
Manufacture of machinery and equipment (excluding weapons and ammunition)	2.11	1.78	1.39	-0.3	-0.4	-0.7
Manufacture of office and accounting machinery	0.02	0.05	0.08	0.0	0.0	0.1
Manufacture of electronic components; radio, television and communication equipment and apparatus	0.36	0.81	0.31	0.4	-0.5	0.0
Manufacture of electrical machinery and apparatus	0.80	0.92	1.00	0.1	0.1	0.2
Manufacture of motor vehicles, trailers and semi-trailers	0.30	0.35	0.18	0.1	-0.2	-0.1
Building of ships and boats; manufacture of air and spacecraft; manufacture of other transport equipment	0.15	0.90	0.14	0.7	-0.8	0,0
Manufacture of medical, precision and optical instruments, photographic equipment, watches and clocks	0.46	1.04	1.63	0.6	0.6	1.2
Manufacture of furniture; manufacturing n.e.c.	7.18	8.63	10.46	1.4	1.8	3.3
RB	45.4	34.8	48.5	-10.6	13.7	3.1
LT	49.2	56.7	44.7	7.5	-12.0	-4.5
MHT	5.34	8.45	6.74	3.1	-1.7	1.4
Belarus						
Manufacture of food products, beverages and tobacco products	13.15	17.32	22.09	4.2	4.8	8.9
Manufacture of textiles	6.14	4.81	3.62	-1.3	-1.2	-2.5
Manufacture of wearing apparel	3.33	2.73	2.42	-0.6	-0.3	-0.9
Tanning and dressing of leather; manufacture of leather products and footwear	1.00	0.48	0.57	-0.5	0.1	-0.4

3	Share of branches in manufactured export (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Manufacture of wood and of products of wood and cork, except furniture	1.47	0.46	0.95	-1.0	0.5	-0.5
Manufacture of pulp, wood pulp, paper, cardboard and paper products	3.10	2.37	2.57	-0.7	0.2	-0.5
Publishing, printing and reproduction of recorded media	0.36	0.42	0.24	0.1	-0.2	-0.1
Manufacture of chemicals and chemical products	17.22	22.33	21.16	5.1	-1.2	3.9
Manufacture of rubber and plastics products	2.59	3.95	3.29	1.4	-0.7	0.7
Manufacture of other non-metallic mineral products	3.36	2.69	3.31	-0.7	0.6	0.0
Manufacture of basic metals	7.83	7.63	7.43	-0.2	-0.2	-0.4
Manufacture of fabricated metal products, except machinery and equipment	3.77	3.61	3.01	-0.2	-0.6	-0.8
Manufacture of machinery and equipment	10.87	11.71	9.54	0.8	-2.2	-1.3
Manufacture of office and accounting machinery	0.14	0.13	0.24	0.0	0.1	0.1
Manufacture of electronic components; radio, television and communication equipment and apparatus	1.00	0.24	0.32	-0.8	0.1	-0.7
Manufacture of electrical machinery and apparatus	6.02	5.61	4.25	-0.4	-1.4	-1.8
Manufacture of motor vehicles, trailers and semi-trailers	1.51	1.59	1.58	0.1	0.0	0.1
Building of ships and boats; manufacture of air and spacecraft; manufacture of other transport equipment	11.97	6.73	7.73	-5.2	1.0	-4.2
Manufacture of medical, precision and optical instruments, photographic equipment, watches and clocks	0.07	0.09	0.32	0.0	0.2	0.2
Manufacture of furniture; manufacturing n.e.c.	5.08	5.10	5.37	0.0	0.3	0.3
RB	21.1	22.8	28.9	1.8	6.1	7.8
LT	30.1	28.7	25.9	-1.4	-2.8	-4.2
MHT	48.8	48.4	45.1	-0.4	-3.3	-3.7
Kazakhstan						
Manufacture of food products, beverages and tobacco products	5.68	8.49	8.98	2.8	0.5	3.3
Manufacture of textiles	0.68	0.26	0.18	-0.4	-0.1	-0.5

3	Share of branches in manufactured export (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Manufacture of wearing apparel	0.10	0.05	0.21	-0.1	0.2	0.1
Tanning and dressing of leather; manufacture of leather products and footwear	3.98	3.19	0.31	-0.8	-2.9	-3.7
Manufacture of wood and of products of wood and cork, except furniture	0.00	0.00	0.02	0.0	0.0	0.0
Manufacture of pulp, wood pulp, paper, cardboard and paper products	0.25	0.21	0.27	0.0	0.1	0.0
Publishing, printing and reproduction of recorded media	0.14	0.04	0.04	-0.1	0.0	-0.1
Manufacture of chemicals and chemical products	8.36	19.34	20.12	11.0	0.8	11.8
Manufacture of rubber and plastics products	0.30	0.40	0.30	0.1	-0.1	0.0
Manufacture of other non-metallic mineral products	0.18	0.23	0.59	0.1	0.4	0.4
Manufacture of basic metals	67.68	54.80	51.26	-12.9	-3.5	-16.4
Manufacture of fabricated metal products, except machinery and equipment	0.20	0.12	0.11	-0.1	0.0	-0.1
Manufacture of machinery and equipment	4.10	2.41	3.32	-1.7	0.9	-0.8
Manufacture of office and accounting machinery	0.06	0.10	0.66	0.0	0.6	0.6
Manufacture of electronic components; radio, television and communication equipment and apparatus	2.40	1.75	5.33	-0.7	3.6	2.9
Manufacture of electrical machinery and apparatus	0.67	0.51	0.83	-0.2	0.3	0.2
Manufacture of motor vehicles, trailers and semi-trailers	0.34	0.16	0.23	-0.2	0.1	-0.1
Building of ships and boats; manufacture of air and spacecraft; manufacture of other transport equipment	0.53	0.38	0.29	-0.2	-0.1	-0.2
Manufacture of medical, precision and optical instruments, photographic equipment, watches and clocks	0.86	0.70	3.99	-0.2	3.3	3.1
Manufacture of furniture; manufacturing n.e.c.	3.51	6.86	2.95	3.4	-3.9	-0.6
RB	6.11	8.93	9.86	2.8	0.9	3.8
LT	76.6	65.7	55.4	-10.8	-10.4	-21.2
MHT	17.3	25..3	34.8	8.0	9.4	17.5
Kyrgyzstan						

3	Share of branches in manufactured export (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Manufacture of food products, beverages and tobacco products	20.89	17.08	10.22	-3.8	-6.9	-10.7
Manufacture of textiles	4.68	2.99	3.14	-1.7	0.1	-1.5
Manufacture of wearing apparel	12.03	30.50	14.73	18.5	-15.8	2.7
Tanning and dressing of leather; manufacture of leather products and footwear	4.64	4.00	1.98	-0.6	-2.0	-2.7
Manufacture of wood and of products of wood and cork, except furniture	0.13	0.09	0.25	0.0	0.2	0.1
Manufacture of pulp, wood pulp, paper, cardboard and paper products	0.92	1.90	1.26	1.0	-0.6	0.3
Publishing, printing and reproduction of recorded media	0.04	0.21	0.05	0.2	-0.2	0.0
Manufacture of chemicals and chemical products	2.28	7.15	11.10	4.9	4.0	8.8
Manufacture of rubber and plastics products	0.56	2.94	4.53	2.4	1.6	4.0
Manufacture of other non-metallic mineral products	21.72	2.77	5.09	-18.9	2.3	-16.6
Manufacture of basic metals	2.16	2.17	8.91	0.0	6.7	6.8
Manufacture of fabricated metal products, except machinery and equipment	1.41	1.65	3.70	0.2	2.0	2.3
Manufacture of machinery and equipment	4.29	7.12	6.19	2.8	-0.9	1.9
Manufacture of office and accounting machinery	0.11	0.16	0.04	0.1	-0.1	-0.1
Manufacture of electronic components; radio, television and communication equipment and apparatus	0.17	0.30	0.23	0.1	-0.1	0.1
Manufacture of electrical machinery and apparatus	10.30	7.49	4.51	-2.8	-3.0	-5.8
Manufacture of motor vehicles, trailers and semi-trailers	0.37	0.78	0.43	0.4	-0.3	0.1
Building of ships and boats; manufacture of air and spacecraft; manufacture of other transport equipment	5.16	6.44	17.46	1.3	11.0	12.3
Manufacture of medical, precision and optical instruments, photographic equipment, watches and clocks	0.37	0.69	2.84	0.3	2.1	2.5
Manufacture of furniture; manufacturing n.e.c.	7.77	3.58	3.33	-4.2	-0.2	-4.4
RB	43.7	21.8	16.8	-21.8	-5.0	-26.8

3	Share of branches in manufactured export (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
LT	33.3	48.0	40.4	14.7	-7.7	7.1
MHT	23.0	30.1	42.8	7.1	12.7	19.8
Moldova						
Manufacture of food products, beverages and tobacco products	43.54	30.32	26.50	-13.2	-3.8	-17.0
Manufacture of textiles	2.72	3.07	3.43	0.4	0.4	0.7
Manufacture of wearing apparel	16.42	20.91	16.29	4.5	-4.6	-0.1
Tanning and dressing of leather; manufacture of leather products and footwear	4.24	4.94	4.25	0.7	-0.7	0.0
Manufacture of wood and of products of wood and cork, except furniture	0.13	0.14	0.16	0.0	0.0	0.0
Manufacture of pulp, wood pulp, paper, cardboard and paper products	0.90	0.56	0.90	-0.3	0.3	0.0
Publishing, printing and reproduction of recorded media	0.11	0.31	0.22	0.2	-0.1	0.1
Manufacture of chemicals and chemical products	1.45	3.46	5.68	2.0	2.2	4.2
Manufacture of rubber and plastics products	0.34	0.74	0.66	0.4	-0.1	0.3
Manufacture of other non-metallic mineral products	3.11	4.18	4.10	1.1	-0.1	1.0
Manufacture of basic metals	16.35	9.52	6.47	-6.8	-3.1	-9.9
Manufacture of fabricated metal products, except machinery and equipment	1.28	1.31	1.03	0.0	-0.3	-0.2
Manufacture of machinery and equipment	3.37	5.98	3.21	2.6	-2.8	-0.2
Manufacture of office and accounting machinery	0.07	0.23	0.07	0.2	-0.2	0.0
Manufacture of electronic components; radio, television and communication equipment and apparatus	0.21	0.24	0.20	0.0	0.0	0.0
Manufacture of electrical machinery and apparatus	1.26	6.25	15.17	5.0	8.9	13.9
Manufacture of motor vehicles, trailers and semi-trailers	0.63	0.94	1.67	0.3	0.7	1.0
Building of ships and boats; manufacture of air and spacecraft; manufacture of other transport equipment	0.60	0.87	0.68	0.3	-0.2	0.1
Manufacture of medical, precision and optical instruments, photographic equipment, watches	0.34	0.26	0.58	-0.1	0.3	0.2

3	Share of branches in manufactured export (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
and clocks						
Manufacture of furniture; manufacturing n.e.c.	2.89	5.76	8.71	2.9	3.0	5.8
RB	47.7	35.2	31.7	-12.5	-3.5	-16.0
LT	44.4	46.6	41.1	2.2	-5.5	-3.3
MHT	7.95	18.23	27.27	10.3	9.0	19.3
Tajikistan						
Manufacture of food products, beverages and tobacco products	1.23	27.21	7.06	26.0	-20.2	5.8
Manufacture of textiles	3.82	2.16	5.46	-1.7	3.3	1.6
Manufacture of wearing apparel	1.44	3.65	4.34	2.2	0.7	2.9
Tanning and dressing of leather; manufacture of leather products and footwear	0.06	0.05	0.90	0.0	0.9	0.8
Manufacture of wood and of products of wood and cork, except furniture	0.01	0.00	0.01	0.0	0.0	0.0
Manufacture of pulp. wood pulp, paper, cardboard and paper products	0.01	0.03	0.06	0.0	0.0	0.1
Publishing, printing and reproduction of recorded media	0.00	0.01	0.09	0.0	0.1	0.1
Manufacture of chemicals and chemical products	2.73	18.87	3.53	16.1	-15.3	0.8
Manufacture of rubber and plastics products	0.08	1.52	0.63	1.4	-0.9	0.6
Manufacture of other non-metallic mineral products	0.22	1.99	0.46	1.8	-1.5	0.2
Manufacture of basic metals	81.15	33.68	62.32	-47.5	28.6	-18.8
Manufacture of fabricated metal products, except machinery and equipment	0.12	0.51	0.21	0.4	-0.3	0.1
Manufacture of machinery and equipment	0.24	1.31	2.24	1.1	0.9	2.0
Manufacture of office and accounting machinery	1.08	0.61	0.69	-0.5	0.1	-0.4
Manufacture of electronic components; radio, television and communication equipment and apparatus	0.40	0.04	0.62	-0.4	0.6	0.2
Manufacture of electrical machinery and apparatus	0.29	0.88	0.50	0.6	-0.4	0.2
Manufacture of motor vehicles, trailers and semi-trailers	0.01	0.04	0.64	0.0	0.6	0.6
Building of ships and boats; manufacture of air	1.48	5.28	2.03	3.8	-3.3	0.6

3	Share of branches in manufactured export (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
and spacecraft; manufacture of other transport equipment						
Manufacture of medical, precision and optical instruments, photographic equipment, watches and clocks	1.05	0.66	1.42	-0.4	0.8	0.4
Manufacture of furniture; manufacturing n.e.c.	4.57	1.49	6.79	-3.1	5.3	2.2
RB	1.48	29.23	7.59	27.8	-21.6	6.1
LT	91.2	43.1	80.7	-48.2	37.7	-10.5
MHT	7.3	27.7	11.7	20.4	-16.0	4.4
Ukraine						
Manufacture of food products, beverages and tobacco products	9.94	15.39	21.43	5.5	6.0	11.5
Manufacture of textiles	0.82	0.55	0.55	-0.3	0.0	-0.3
Manufacture of wearing apparel	2.56	1.85	1.50	-0.7	-0.4	-1.1
Tanning and dressing of leather; manufacture of leather products and footwear	0.89	0.98	0.79	0.1	-0.2	-0.1
Manufacture of wood and of products of wood and cork, except furniture	0.91	0.70	1.00	-0.2	0.3	0.1
Manufacture of pulp, wood pulp, paper, cardboard and paper products	1.97	3.17	3.72	1.2	0.6	1.7
Publishing, printing and reproduction of recorded media	0.19	0.40	0.40	0.2	0.0	0.2
Manufacture of chemicals and chemical products	11.08	7.74	7.00	-3.3	-0.7	-4.1
Manufacture of rubber and plastics products	1.15	1.08	0.79	-0.1	-0.3	-0.4
Manufacture of other non-metallic mineral products	1.19	1.06	1.25	-0.1	0.2	0.1
Manufacture of basic metals	49.57	40.71	37.83	-8.9	-2.9	-11.7
Manufacture of fabricated metal products, except machinery and equipment	1.39	1.61	1.53	0.2	-0.1	0.1
Manufacture of machinery and equipment	7.03	9.51	8.10	2.5	-1.4	1.1
Manufacture of office and accounting machinery	0.25	0.15	0.11	-0.1	0.0	-0.1
Manufacture of electronic components; radio, television and communication equipment and apparatus	0.35	1.31	1.35	1.0	0.0	1,0
Manufacture of electrical machinery and apparatus	3.08	5.86	5.40	2.8	-0.5	2.3

3	Share of branches in manufactured export (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Manufacture of motor vehicles, trailers and semi-trailers	0.50	0.86	0.56	0.4	-0.3	0.1
Building of ships and boats; manufacture of air and spacecraft; manufacture of other transport equipment	1.18	1.23	0.65	0.1	-0.6	-0.5
Manufacture of medical, precision and optical instruments, photographic equipment, watches and clocks	4.71	4.06	3.10	-0.7	-1.0	-1.6
Manufacture of furniture; manufacturing n.e.c.	1.23	1.78	2.94	0.5	1.2	1.7
RB	14.0	20.3	27.4	6.3	7.1	13.4
LT	57.8	49.0	46.3	-8.8	-2.6	-11.5
MHT	28.2	30.7	26.3	2.5	-4.5	-1.9

Source: UNCTADstat database, authors' calculations.

Table A.10 – Main industrial activities contribution to national MVA

	Share of industries in total MVA (in %)			Changes (in percentage points)		
	2005	2009	2014	2005-2009	2009-2014	2005-2014
Russia						
Manufacture of food products and beverages	13.5	16.1	12.7	2.6	-3.4	-0.8
Manufacture of tobacco products	0.8	0.8	0.9	0.0	0.1	0.1
Manufacture of textiles	0.7	0.7	0.6	0.0	-0.1	-0.1
Manufacture of wearing apparel	1.0	0.8	0.9	-0.2	0.1	-0.1
Tanning and dressing of leather; manufacture of leather products and footwear	0.3	0.3	0.2	0.1	-0.1	-0.1
Manufacture of wood and of products of wood and cork, except furniture	2.1	1.9	1.6	-0.2	-0.3	-0.5
Manufacture of pulp, wood pulp, paper, cardboard and paper products	1.2	1.5	1.8	0.3	0.3	0.6
Publishing, printing and reproduction of recorded media	2.4	2.2	1.4	-0.2	-0.8	-1.0
Manufacture of coke and refined petroleum products	20.0	23.1	24.7	3.2	1.5	4.7
Manufacture of chemicals and chemical products (excluding gunpowder and explosives)	9.0	9.5	7.9	0.5	-1.5	-1.0
Manufacture of rubber and plastics products	1.5	2.1	1.9	0.6	-0.1	0.4

	Share of industries in total MVA (in %)			Changes (in percentage points)		
Manufacture of other non-metallic mineral products	5.6	5.6	4.5	0.1	-1.1	-1.0
Manufacture of basic metals	17.5	15.0	14.9	-2.5	-0.1	-2.6
Manufacture of fabricated metal products, except machinery and equipment	2.0	2.4	2.6	0.4	0.2	0.6
Manufacture of machinery and equipment (excluding weapons and ammunition)	5.8	4.5	5.5	-1.3	1.0	-0.2
Manufacture of office, accounting and computing machinery	0.1	0.2	0.2	0.0	0.1	0.1
Manufacture of electrical machinery and apparatus	2.5	1.8	1.8	-0.7	0.0	-0.7
Manufacture of electronic components; radio, television and communication equipment and apparatus	1.3	0.8	1.4	-0.5	0.6	0.1
Manufacture of medical, precision and optical instruments, photographic equipment, watches and clocks	1.9	1.5	2.4	-0.4	0.9	0.5
Manufacture of motor vehicles, trailers and semi-trailers	2.1	1.2	2.4	-0.9	1.3	0.4
Building of ships and boats; manufacture of air and spacecraft; manufacture of other transport equipment	4.0	3.5	7.8	-0.4	4.2	3.8
Manufacture of furniture; manufacturing n.e.c.	1.6	1.4	1.2	-0.2	-0.2	-0.4
Manufacturing n.e.s.	3.2	2.9		-0.3	-	-
Recycling			0.5	-	-	-
Azerbaijan						
Manufacture of food products and beverages and tobacco products	39.0	35.1	35.4	-3.9	0.3	-3.6
Manufacture of textiles and wearing apparel	1.7	1.3	1.3	-0.4	0.0	-0.4
Tanning and dressing of leather; manufacture of leather products and footwear	0.2	0.4	0.2	0.2	-0.1	0.1
Manufacture of wood and of products of wood and cork, except furniture	0.3	0.2	0.2	-0.1	0.0	-0.1
Publishing, printing and reproduction of recorded media	0.8	0.9	0.4	0.1	-0.5	-0.3
Manufacture of coke and refined petroleum products	27.2	38.2	35.3	10.9	-2.8	8.1
Manufacture of chemicals and chemical products	6.5	2.7	3.1	-3.7	0.3	-3.4
Manufacture of rubber and plastics products	0.8	1.2	0.9	0.5	-0.4	0.1
Manufacture of other non-metallic mineral products	4.4	7.6	6.2	3.2	-1.4	1.8
Manufacture of basic metals	8.9	1.8	3.5	-7.0	1.6	-5.4
Manufacture of fabricated metal products, except machinery and equipment	1.8	2.1	1.6	0.3	-0.5	-0.2

	Share of industries in total MVA (in %)			Changes (in percentage points)		
Manufacture of computers, electronic and optical equipment	0.2	0.8	0.8	0.5	0.1	0.6
Manufacture of electrical machinery and apparatus	0.6	0.8	2.0	0.2	1.2	1.4
Manufacture of machinery and equipment n.e.s.	1.1	1.9	3.5	0.9	1.5	2.4
Manufacture of motor vehicles and other transport equipment	0.6	0.5	1.2	-0.2	0.7	0.6
Armenia						
Manufacture of food products, beverages and tobacco products	47.2	53.1	58.6	5.9	5.5	11.4
Manufacture of textiles and wearing apparel	1.1	0.9	0.9	-0.1	0.0	-0.1
Tanning and dressing of leather; manufacture of leather products and footwear	0.1	0.2	0.1	0.1	0.0	0.1
Manufacture of wood and of products of wood and cork, except furniture; articles of straw and plaiting materials	0.3	0.2	0.2	-0.1	0.0	-0.1
Publishing, printing and reproduction of recorded media	2.3	0.7	1.7	-1.6	1.0	-0.6
Manufacture of chemicals and chemical products	3.7	2.1	1.0	-1.6	-1.2	-2.7
Manufacture of rubber and plastics products	1.0	3.1	3.1	2.1	0.0	2.1
Manufacture of other non-metallic mineral products	5.7	9.4	6.2	3.7	-3.2	0.5
Manufacture of basic metals; manufacture of fabricated metal products, except machinery and equipment	31.3	22.5	21.8	-8.8	-0.7	-9.5
Manufacture of computers, electronic and optical equipment; electrical machinery and apparatus	2.2	1.6	1.2	-0.6	-0.3	-0.9
Manufacture of machinery and equipment n.e.s.	1.6	0.7	0.4	-0.9	-0.3	-1.2
Manufacturing of other transport equipment	0.1	0.0	0.0	-0.1	0.0	-0.1
Belarus						
Manufacture of food products, beverages and tobacco products	20.1	22.9	26.4	2.8	3.5	6.3
Manufacture of textiles and wearing apparel	4.6	3.9	3.4	-0.7	-0.5	-1.2
Tanning and dressing of leather; manufacture of leather products and footwear	1.0	0.9	0.9	-0.1	0.0	-0.1
Manufacture of wood and of products of wood and cork, except furniture	2.2	1.8	2.2	-0.4	0.4	0..0
Manufacture of wood and paper products; publishing and printing	2.2	2.1	1.7	-0.1	-0.4	-0.5
Manufacture of coke and refined petroleum products; nuclear materials	21.7	20.6	18.1	-1.1	-2.5	-3.6

	Share of industries in total MVA (in %)			Changes (in percentage points)		
Manufacture of chemicals and chemical products	10.0	9.5	11.0	-0.5	1.5	1.0
Manufacture of rubber and plastics products	2.8	3.6	3.9	0.8	0.2	1.1
Manufacture of other non-metallic mineral products	4.5	5.9	6.2	1.4	0.3	1.7
Manufacture of basic metals; manufacture of fabricated metal products, except machinery and equipment	6.8	7.1	7.1	0.3	0.0	0.4
Manufacture of machinery and equipment	10.7	10.6	8.4	-0.1	-2.1	-2.3
Manufacture of computers, electronic and optical equipment; electrical machinery and apparatus	4.3	4.0	3.9	-0.3	-0.1	-0.4
Manufacturing of transport equipment	6.7	4.7	3.9	-2.0	-0.7	-2.8
Kazakhstan						
Manufacture of food products, beverages and tobacco products	26.2	27.9	23.7	1.7	-4.2	-2.6
Manufacture of textiles and wearing apparel	1.9	0.9	0.9	-1.1	0.1	-1.0
Tanning and dressing of leather; manufacture of leather products and footwear	0.1	0.1	0.1	-0.01	0.02	0.01
Manufacture of wood and of products of wood and cork, except furniture	0.4	0.3	0.3	-0.10	0.02	-0.08
Manufacture of coke and refined petroleum products	8.4	7.3	9.3	-1.1	2.0	0.9
Manufacture of chemicals and chemical products	2.9	2.9	3.8	0.0	0.9	0.9
Manufacture of rubber and plastics products	1.6	2.0	2.6	0.4	0.6	1.0
Manufacture of other non-metallic mineral products	5.9	6.2	7.4	0.3	1.2	1.5
Manufacture of basic metals	37.3	36.6	31.4	-0.7	-5.2	-5.9
Manufacture of fabricated metal products, except machinery and equipment	2.4	3.6	3.0	1.2	-0.6	0.6
Manufacture of computers, electronic and optical equipment	0.7	0.4	0.6	-0.2	0.2	-0.1
Manufacture of electrical machinery and apparatus	1.0	1.2	1.4	0.3	0.2	0.4
Manufacture of machinery and equipment n.e.s.	1.9	1.5	1.7	-0.4	0.2	-0.2
Manufacture of motor vehicles and other transport equipment	0.3	0.2	3.1	-0.1	2.9	2.8
Kyrgyzstan						
Manufacture of food products, beverages and tobacco products	20.4	18.9	16.7	-1.5	-2.2	-3.7
Manufacture of textiles and wearing apparel	5.6	5.6	3.9	-0.1	-1.7	-1.8
Tanning and dressing of leather; manufacture of leather products and footwear	0.2	0.3	0.2	0.1	-0.1	0.0

	Share of industries in total MVA (in %)			Changes (in percentage points)		
Manufacture of wood and of products of wood and cork, except furniture	0.2	0.3	0.4	0.1	0.1	0.2
Manufacture of pulp, wood pulp, paper, cardboard and paper products; printing and publishing	1.9	1.5	0.6	-0.3	-0.9	-1.3
Manufacture of refined petroleum products	1.4	1.7	2.6	0.3	0.9	1.3
Manufacture of chemicals and chemical products	1.4	0.7	0.9	-0.8	0.2	-0.5
Manufacture of rubber and plastics products	2.8	1.4	1.4	-1.4	0.0	-1.4
Manufacture of other non-metallic mineral products	10.4	6.8	10.8	-3.6	4.0	0.4
Manufacture of basic metals; manufacture of fabricated metal products, except machinery and equipment	49.0	58.8	58.8	9.8	0.0	9.8
Manufacture of machinery and equipment	2.8	1.1	0.2	-1.7	-0.9	-2.6
Manufacture of computers, electronic and optical equipment; manufacture of electrical machinery and apparatus	2.6	1.7	1.4	-1.0	-0.3	-1.3
Manufacture of transport equipment	0.6	0.5	0.5	0.0	0.0	-0.1
Moldova						
Manufacture of food products and beverages	49.3	51.2	49.9	1.9	-1.3	0.6
Manufacture tobacco products	1.9	2.8	0.9	0.9	-1.8	-0.9
Manufacture of textiles	3.1	2.7	4.6	-0.4	1.9	1.5
Manufacture of wearing apparel	3.9	4.4	5.0	0.5	0.6	1.1
Tanning and dressing of leather; manufacture of leather products and footwear	1.3	1.3	1.1	0.0	-0.2	-0.2
Manufacture of wood and of products of wood and cork, except furniture	0.7	1.0	0.6	0.3	-0.4	-0.1
Publishing, printing and reproduction of recorded media	2.3	2.8	1.1	0.5	-1.7	-1.2
Manufacture of chemicals and chemical products	1.6	3.3	2.5	1.7	-0.8	0.9
Manufacture of rubber and plastics products	4.5	4.3	4.6	-0.2	0.4	0.1
Manufacture of other non-metallic mineral products	14.4	11.9	11.0	-2.5	-1.0	-3.4
Manufacture of basic metals	0.6	0.8	0.3	0.2	-0.6	-0.3
Manufacture of fabricated metal products, except machinery and equipment	2.8	2.7	3.2	-0.1	0.5	0.4
Manufacture of machinery and equipment	2.7	2.0	1.5	-0.7	-0.5	-1.2
Manufacture of electrical machinery and apparatus	0.8	1.3	3.6	0.4	2.3	2.7
Manufacture of radio, television and communication equipment and apparatus	0.2	0.2	0.0	0.0	-0.2	-0.2

	Share of industries in total MVA (in %)			Changes (in percentage points)		
Manufacture of medical, precision and optical instruments	1.2	1.0	0.0	-0.1	-1.0	-1.2
Tajikistan						
Manufacture of food products, beverages and tobacco products (before 2011 - food industry)	20.9	24.5	46.9	3.6	22.4	26.0
Manufacture of textiles and wearing apparel (before 2011 - light industry)	18.8	12.7	18.9	-6.1	6.2	0.1
Tanning and dressing of leather; manufacture of leather products and footwear	0.0	0.0	0.3	0.0	0.3	0.3
Manufacture of wood and of products of wood and cork (before 2011 – timber, woodworking and pulp and paper industry)	0.3	0.4	0.8	0.1	0.4	0.5
Manufacture of pulp, wood pulp, paper, cardboard and paper products; printing and publishing	0.0	0.0	1.7	0.0	1.7	1.7
Manufacture of coke and refined petroleum products; nuclear materials	0.0	0.0	1.4	0.0	1.4	1.4
Manufacture of chemicals and chemical products (before 2011 – chemical and petrochemical industry)	1.3	0.4	0.9	-0.9	0.5	-0.4
Manufacture of rubber and plastics products	0.0	0.0	0.9	0.0	0.9	0.9
Manufacture of other non-metallic mineral products (before 2011 – construction materials industry)	2.7	5.9	13.5	3.2	7.7	10.8
Manufacture of basic metals; manufacture of fabricated metal products, except machinery and equipment (before 2011 – non-ferrous metallurgy)	45.1	45.2	13.2	0.2	-32.1	-31.9
Manufacture of machinery and equipment (before 2011 – machine building and metalworking)	1.7	2.8	0.6	1.1	-2.2	-1.1
Manufacture of electronic and optical equipment; manufacture of electrical machinery and apparatus	0.0	0.0	0.3	0.0	0.3	0.3
Ukraine						
Manufacture of food products, beverages and tobacco products	21.5	28.5	33.5	7.0	4.9	12.0
Manufacture of textiles, wearing apparel; leather and leather products, footwear	1.4	1.3	1.3	-0.1	-0.1	-0.1
Manufacture of wood and paper products; publishing and printing	4..3	5..1	4..9	0..8	-0..2	0..5
Manufacture of coke and refined petroleum products	12.4	9.6	5.2	-2.8	-4.4	-7..2
Manufacture of chemicals and chemical products	6.2	6.0	5.5	-0.3	-0.4	-0..7
Manufacture of rubber and plastics products; manufacture of other non-metallic mineral products	6.1	7.0	7.1	0.9	0.1	1.0

	Share of industries in total MVA (in %)			Changes (in percentage points)		
Manufacture of basic metals; manufacture of fabricated metal products, except machinery and equipment	29..1	25.3	26.3	-3.8	1.0	-2.8
Manufacture of computers, electronic and optical equipment; manufacture of electrical machinery and apparatus	3.8	4.4	3.2	0.6	-1.2	-0..6
Manufacture of machinery and equipment, n.e.s.	5.9	6.1	3.7	0.3	-2.4	-2.1
Manufacture of motor vehicles, trailers and semi-trailers other transport equipment	7.2	4.8	4.3	-2.3	-0.5	-2.8
Resource-based industries						
Russia	23.1	26.0	21.5	2.9	-4.4	-1.6
Azerbaijan	43.7	42.9	41.8	-0.8	-1.1	-1.9
Armenia	53.2	62.7	65.0	9.5	2.3	11.8
Belarus	29.0	32.6	36.5	3.6	3.8	7.4
Kazakhstan	32.5	34.4	31.4	1.8	-3.0	-1.1
Kyrgyzstan	32.8	27.5	28.5	-5.3	1.0	-4.3
Moldova	66.2	66.9	62.4	0.6	-4.5	-3.8
Tajikistan	23.9	30.8	62.9	6.9	32.1	39.0
Ukraine	25.8	33.6	38.3	7.8	4.7	12.5
Low-tech industries						
Russia	50.2	51.0	48.9	0.8	-2.1	-1.3
Azerbaijan	47.3	50.4	47.7	3.1	-2.7	0.4
Armenia	39.3	33.0	32.4	-6.3	-0.6	-6.9
Belarus	39.2	38.6	36.3	-0.6	-2.3	-3.0
Kazakhstan	60.8	59.4	58.0	-1.4	-1.4	-2.7
Kyrgyzstan	59.7	68.5	68.5	8.8	0.0	8.8
Moldova	27.3	25.4	30.1	-1.9	4.7	2.7
Tajikistan	73.2	66.1	35.4	-7.1	-30.7	-37.8
Ukraine	51.2	45.1	44.9	-6.1	-0.2	-6.2
Medium- and high-tech industries						
Russia	26.7	23.0	29.6	-3.7	6.6	2.9
Azerbaijan	9.0	6.7	10.5	-2.3	3.8	1.5
Armenia	7.5	4.4	2.6	-3.1	-1.8	-4.9
Belarus	31.7	28.8	27.3	-3.0	-1.5	-4.5

	Share of industries in total MVA (in %)			Changes (in percentage points)		
Kazakhstan	6.7	6.2	10.6	-0.5	4.3	3.9
Kyrgyzstan	7.5	4.0	3.0	-3.5	-1.0	-4.5
Moldova	6.5	7.8	7.5	1.3	-0.2	1.1
Tajikistan	2.9	3.1	1.7	0.2	-1.4	-1.2
Ukraine	23.0	21.3	16.8	-1.7	-4.5	-6.2

Source: Rosstat, CISSTAT, authors' calculations.

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Vienna International Centre · P.O. Box 300 9 · 1400 Vienna · Austria
Tel.: (+43-1) 26026-0 · E-mail: info@unido.org
www.unido.org