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INDUSTRIAL GROWTH AND THE DISTRIBUTION PATTERN OF MANUFACTURING OUTPUT IN THE EURASIAN ECONOMIC UNION (EAEU)

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Industrial growth and the distribution pattern of manufacturing output in the Eurasian Economic Union (EAEU)

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1. Introduction

The Eurasian Economic Union (EAEU) is an international organization promoting regional economic integration. It was established by the Treaty of the Eurasian Economic Union in 2014. The EAEU provides for the free movement of goods, services, capital and labour, pursues coordinated, harmonized and single policy in the sectors determined by the Treaty and international agreements within the Union. The member states of the EAEU are the Republic of Armenia (AM), the Republic of Belarus (BY), the Republic of Kazakhstan (KZ), the Kyrgyz Republic (KG) and the Russian Federation (RU).

The year 2015 was characterized by oil shocks and recession in both Russia and Kazakhstan, which had a negative impact on the economies of other EAEU members. Despite these unfavourable external conditions, the integration process has been quite successful.

The manufacturing industry is a driver of economic growth in any country, and the EAEU is no exception. According to the Treaty, the Union aims to raise and comprehensively upgrade the competitiveness of its members' national economies by elaborating a new development model and implementing a coordinated industrial policy. The main objective for the integration process is industrial cooperation in the EAEU. Thus, for the first time in the post-Soviet era, industrial policy is highlighted as one of the key elements of the relationships between the members.

In accordance with the Lima Declaration adopted by the member states of the United Nations Industrial Development Organization (UNIDO) on 2 December 2013, the organization promotes the concept of comprehensive and sustainable industrial development, based on the sustainable development goals (SDGs). UNIDO is in charge of reporting on a number of SDG 9 indicators: industry, innovation and infrastructure, namely to "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation".

The EAEU countries also integrate the SDGs in their activities. As the largest integration association in Eurasia, the Union's mission is to advance member states' sustainable economic development. This corresponds with the SDGs' development objectives. The objectives include continuous economic growth and energy security, implementation of innovative solutions in the production and consumption, deepening of industrial cooperation, enhancement of transport infrastructure as well as social and medical support for citizens, which correspond to the sustainable development goals. This analysis focusses only on the EAEU members' SDG-9 performance in the process of industrialization.

This analysis aims to provide an overview of the EAEU countries' manufacturing industries based on their manufacturing value added (MVA), which reflects each country's level of industrialization. The analysis covers the three key dimensions of industrial performance in the EAEU: 1) productivity, 2) structural change, and 3) competitiveness. Each of these dimensions is represented by a number of indicators described below.

1.1. Indicators

Gross domestic product (GDP) of the EAEU countries (constant prices, USD billions), share in world GDP (%), GDP annual growth rates (%), population in EAEU countries (thousands), annual growth rates (%), GDP per capita (USD), annual growth rates (%), structure of GDP by main types of economic activity (constant prices, USD million), industrial production index;

Manufacturing value added (MVA) of the EAEU countries (constant prices, USD million), share in world MVA (%), MVA annual growth rates (%), share of each EAEU country in total MVA of the EAEU (%), MVA per capita (USD), MVA share in GDP (%), major manufacturing activities (%), MVA structure by technological level of industry (current prices, USD million), relative structural change, coefficients of industrial concentration and diversification;

Employment in EAEU countries (distribution by economic activity, in %), share of manufacturing employment in total employment in the EAEU (%), share of value added of manufacturing industry in the country's value added, annual growth rates (%), employment elasticities and value-added growth rates in the manufacturing sector of the EAEU countries (%), value added per employee (USD), index of labour productivity (%), employment in certain types of manufacturing activity of the EAEU countries (%);

Manufacturing export of EAEU countries (total and by main types of industrial activity, current prices, USD billion), annual growth rates (%), total volume of merchandise trade of EAEU countries (current prices, USD billions), share of manufacturing export in total exports (%), technological structure of exported products (%), manufacturing exports per capita (USD), relative structural change, export concentration index (HHI index), export diversification of manufacturing industries (EDI index);

Carbon dioxide emission from manufacturing of EAEU countries, carbon dioxide emission per unit of manufacturing value added (kilogrammes of CO_2 per constant 2010 USD);

Competitive industrial performance index;

Green industrial performance index.

1.2 Data sources

- UNIDO Statistics Data Portal,
- United Nations Statistics Division Data Portal,
- UN Comtrade Database,
- International Labour Organization Statistics,
- Eurasian Economic Commission,
- UNIDO Industrial Statistics: Guidelines and methodology (2010),
- National industrial development strategies.

1.3 Literature review

Much attention has been paid to industrial development and inclusive and sustainable industrialization. Manufacturing, described as the engine of economic growth and structural change, represents an integral part of manufacturing. The relative significance of the manufacturing sector changes at different income levels as countries develop (UNIDO, 2015).

Technological change is an important determinant of structural change because its rate differs considerably between economic sectors, thus stimulating economic growth that favours some sectors over others. According to Fagerberg, incremental innovation also drives economic growth. Its cumulative effect on long-term economic and social change may be even greater than that of radical innovation (Fagerberg, 2006).

Manufacturing undoubtedly promotes productive employment with higher wages as a result of higher levels of productivity. Rapid industrial growth can boost employment in many countries. At the same time, studies also show that, on average, countries across all levels of income now have a lower manufacturing share than before, and that they reach their peak employment and value-added shares at a lower income level than in previous decades (Ghani and O'Connell, 2014; Rodrik, 2015).

Another important economic driver for many economies is manufacturing exports. The value-added share of exports in GDP is one of the most important determinants of economic growth (Lavopa, 2015). Yet the composition of exports plays a substantial role. Lall (2001) argues that sound export structures are crucial for growth and development.

The manufacturing industry's competitiveness is one of the key determinants of long-term sustainable growth. UNIDO's Competitive Industrial Performance index (UNIDO, 2019) assesses and benchmarks industrial competitiveness. At the same time, industrial development needs to take place in an environmentally sustainable manner, as increased consumption of new

products can damage the environment. Special attention in this paper is therefore paid to greening the manufacturing industry as well as the Green Industrial Performance index (Moll de Alba, J. and Todorov, V., 2018; 2019).

Studies carried out by Russian researchers examine various aspects of the Eurasian integration agenda, the sectoral structure of the economy and industrial policy (Dorzhieva, 2019); the main challenges for industrial development (Manturov, 2018); and the industrial performance and competitiveness of EAEU countries (Gurova, 2017). However, there is a gap in systemic research on the link between integration and the industrial performance of the Eurasian Economic Union, which this paper aims to close.

2. Assessment of economic growth in the EAEU

Integration in the EAEU began under extremely difficult economic conditions. First of all, the transformation of the socio-economic and political system at the beginning of the 1990s implied a huge loss of production and welfare for the national economies. The most significant outcome of the transformation was the establishment of a market economy open to the movement of goods, services, capital and labour. Nevertheless, the structure of the economies and level of development of the EAEU countries differ significantly. The global economic and financial crisis of 2008-2009 caused further high uncertainty, and the external price shock of 2014–2015 led to a considerable reduction in the export and financial capacities of all members of the Union, and was a critical test for the stability of the EAEU's economies.

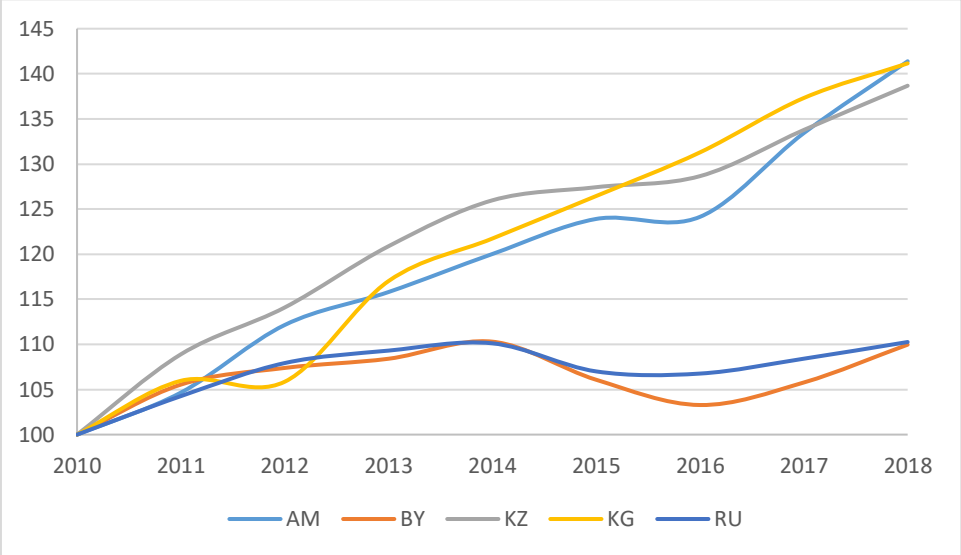
Gross domestic product (GDP) represents an important point of reference for analysis of a country's overall economic development. Within the period 2010–2018, the GDP of all EAEU countries generally increased, but the economies' growth rates differed. In 2018, the GDP of the five member states amounted to USD 1,970 billion, i.e. 2.39 per cent of global GDP. Russia's share in world GDP accounted for 2 per cent, but its share in the Union's GDP declined by 2 per cent between 2010 and 2018, amounting to USD 1,681 billion or 85.33 per cent.

In the period 2010–2018, the annual growth rate of the GDP in the EAEU was 12.92 per cent (two times less than the world's figure), primarily due to the contribution of Armenia (+41.43 per cent), Kyrgyzstan (+41.12 per cent) and Kazakhstan (+38.67 per cent). The rapid growth of Kazakhstan's economy in 2010–2018 was largely attributable to the increase in production of the primary industry and the export of mineral resources. In Armenia and Kyrgyzstan, economic growth was also bolstered by the primary industry, with a sharp increase in world copper prices—Armenia's main export—as well as an increase in the inflow of transfers from abroad. It is an

open secret that the economy of Kyrgyzstan is highly dependent on remittances by migrants (Table 1).

By the end of 2014, a noticeable decline in the GDP growth rates of EAEU countries was evident against the backdrop of falling oil prices, sanctions and a strong devaluation of the region's national currencies (UNIDO, 2019). Figure1 shows that as a result of coordinated policy, EAEU countries managed to turn around the negative trend in GDP growth in 2015–2016 into a positive one. The GDP growth rates in the EAEU vary significantly, with Armenia, Kazakhstan and Kyrgyzstan leading the group and Belarus and Russia lagging behind. This can be explained by the insufficient contribution of the two countries' industrial production to economic growth. In 2018, the GDP growth rate amounted to 6 per cent in Armenia, 3.96 per cent in Belarus, 3.66 per cent in Kazakhstan, 2.73 per cent in Kyrgyzstan, and 1.70 per cent in Russia.

Figure 1: GDP growth rates in EAEU countries (2010 = 100%)



Source: UNCTADstat Data Portal, author's calculations

The EAEU accounts for 2.37 per cent of the global population or 180.8 million people. In the period 2010–2018, there was a strong upward trend in population growth in all EAEU countries, except Belarus and Russia. Since 2016, Belarus has witnessed a serious decline in its population growth rate. This figure remained the same in Russia in 2018. According to the latest data, the level of natural decline in the population (difference between total fertility rate and total mortality rate) in Belarus in 2018 was -2.8 per cent per 1,000 people, and -1.5 per cent per 1,000 people in Russia (Eurasian Economic Commission, 2019) (Table 2).

Table 1: Trends in the development of GDP growth in EAEU countries (constant 2010 prices, USD billions)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
AM	9.87	10.33	11.07	11.43	11.85	12.23	12.25	13.17	13.96
BY	57.23	60.40	61.46	62.04	63.12	60.71	59.10	60.54	62.94
KZ	148.04	161.22	168.91	178.96	186.50	188.65	190.46	198.04	205.30
KG	4.79	5.08	5.07	5.61	5.83	6.06	6.29	6.58	6.76
RU	1524.91	1589.94	1645.87	1666.93	1679.24	1631.75	1628.08	1653.25	1681.44
EAEU	1744.86	1826.98	1892.39	1924.99	1946.56	1899.41	1896.21	1931.59	1970.41
World	65970.49	68043.47	69718.62	71519.92	73543.17	75583.01	77431.08	79800.10	82231.56

Source: UNCTADstat Data Portal, author's calculations

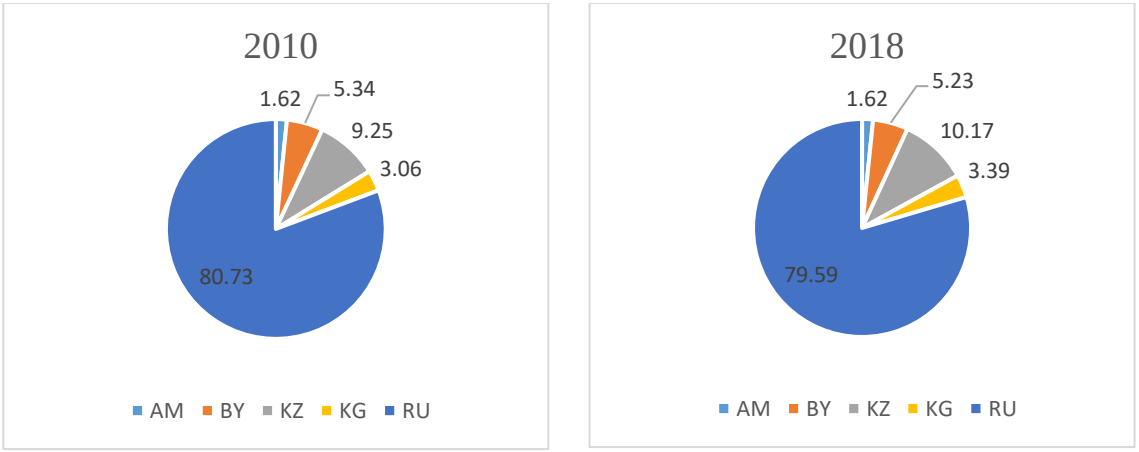
Table 2: Trends in the development of population growth in EAEU countries (thousands)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
AM	2877	2876	2882	2894	2906	2917	2925	2930	2934
BY	9473	9468	9472	9479	9485	9486	9480	9468	9452
KZ	16399	16647	16921	17207	17488	17750	17988	18204	18404
KG	5422	5507	5594	5684	5775	5865	5956	6045	6133
RU	143154	143264	143421	143597	143761	143888	143965	143990	143965
EAEU	177325	177762	178290	178861	179415	179906	180314	180637	180888
World	6944577	7029005	7113774	7198633	7283273	7367443	7451013	7533927	7616101

Source: UNCTADstat Data Portal, author's calculations

Despite a slowdown in population growth rates, Russia accounts for nearly 80 per cent of the EAEU's population and leads the rest of the countries in the region. One of Russia's main competitive advantages, therefore, is its receptive internal market. Kazakhstan ranks second, representing 10.17 per cent of the total EAEU population, and the remaining three countries account for almost 10 per cent (Figure 2).

Figure 2: Regional structure of population in EAEU countries (%)



Source: UNCTADstat Data Portal, author's calculations

The EAEU countries, as well as many other countries around the world, are characterized by the wealth disparity between different groups of the population. The deteriorating economic performance within the EAEU in 2015–2016 influenced the members' GDP per capita growth rate as well. In this period, the GDP per capita decreased in Belarus, Russia and Kazakhstan, due to the strong depreciation of their national currencies against the US dollar and the euro (Table 3).

In the period 2010–2018, the annual growth rate of GDP per capita in the EAEU was 10.70 per cent – slightly less than the world's figure of 13.65 per cent. The highest GDP per capita growth rates were registered in Armenia (+38.64 per cent), Kyrgyzstan (+24.79 per cent), Kazakhstan (+23.56 per cent), while those in Belarus (+10.21 per cent) and Russia (+9.64 per cent) were lower. In 2018, the GDP per capita growth rates were 5.82 per cent in Armenia, 4.14 per cent in Belarus, 2.53 per cent in Kazakhstan, 1.32 per cent in Kyrgyzstan and 1.72 per cent in Russia. Nevertheless, Russia has the highest GDP per capita among the EAEU countries (USD 11,679.50), followed by Kazakhstan (USD 11,155.56), Belarus (USD 6,658.90), Armenia (USD 4,758.69) and Kyrgyzstan (USD 1,103.37). In 2018, the range of GDP per capita within the EAEU was 10-fold between the highest and the lowest figure (Figure 3).

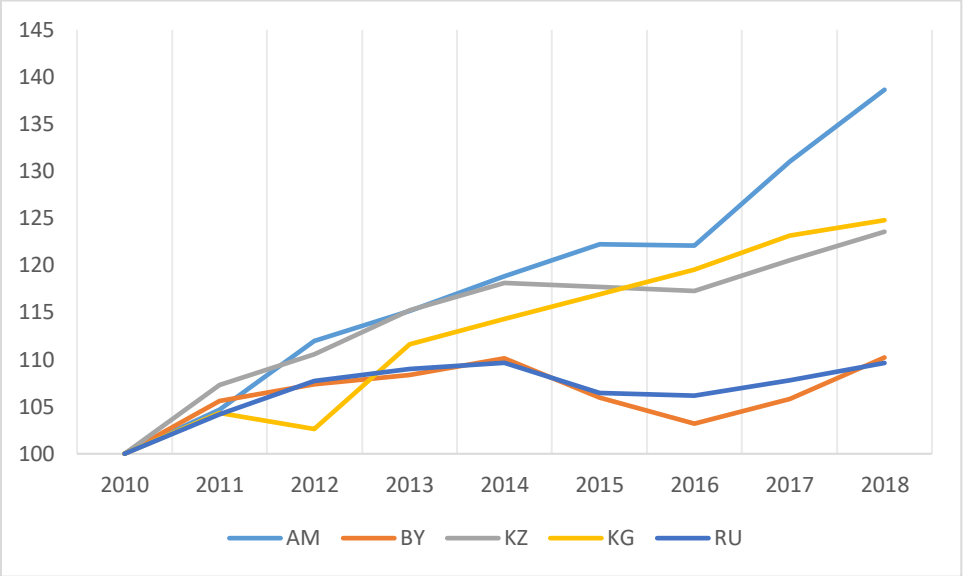
Table 3: Trends in the development of GDP per capita growth in EAEU countries (USD)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
AM	3432.39	3593.53	3842.81	3951.62	4078.45	4194.72	4191.11	4496.92	4758.69
BY	6041.59	6380.01	6488.70	6545.62	6655.66	6400.16	6235.12	6394.17	6658.90
KZ	9027.80	9684.92	9982.33	10400.83	10664.46	10628.28	10588.67	10879.37	11155.56
KG	884.17	922.46	907.22	986.98	1010.56	1033.58	1056.74	1088.99	1103.37
RU	10652.28	11097.99	11475.83	11608.41	11680.82	11340.45	11308.87	11481.71	11679.50
EAEU	9839.93	10277.72	10614.15	10762.50	10849.50	10557.82	10516.17	10693.26	10893.02
World	9499.57	9680.39	9800.51	9935.21	10097.54	10259.06	10392.02	10592.10	10797.07

Source: UNCTADstat Data Portal, author's calculations

Taking the size of Russia's domestic market and the purchasing power of its local population into account, steady demand for industrial goods, especially from labour-intensive and medium- and high-tech industries from both national and foreign producers, is feasible. The EAEU members are therefore interested in Russia as the largest market for their industrial products. There is consequently an incentive in the EAEU to develop manufacturing production with high value added as it can trigger the economic growth of its member states and make them less dependent on primary commodities markets. Russia could thereby escape the oil curse.

Figure 3: GDP per capita growth rates in EAEU countries (2010 = 100%)



Source: UNCTADstat Data Portal, author's calculations

As a country's income increases, the share of agriculture tends to decline while that of services gradually increases. Unlike these two sectors, the weight of manufacturing in the economy does not continuously reduce or increase throughout the course of a country's development. It usually acts as an engine of growth at a certain stage of development.

The structure of gross value added (GVA) by main type of economic activity differs in the EAEU member states. In 2017, services accounted for the largest share of GVA in the EAEU (nearly 60 per cent), followed by industry (nearly 35 per cent) and agriculture (5 per cent) (Appendix 1). Compared to 2010, despite moderate growth in the share of agriculture in the EAEU (0.65 per cent), there was a decline in the share of industry by 2.98 per cent, with the most significant drop registered in Armenia (13 per cent) and Kazakhstan (7.68 per cent).

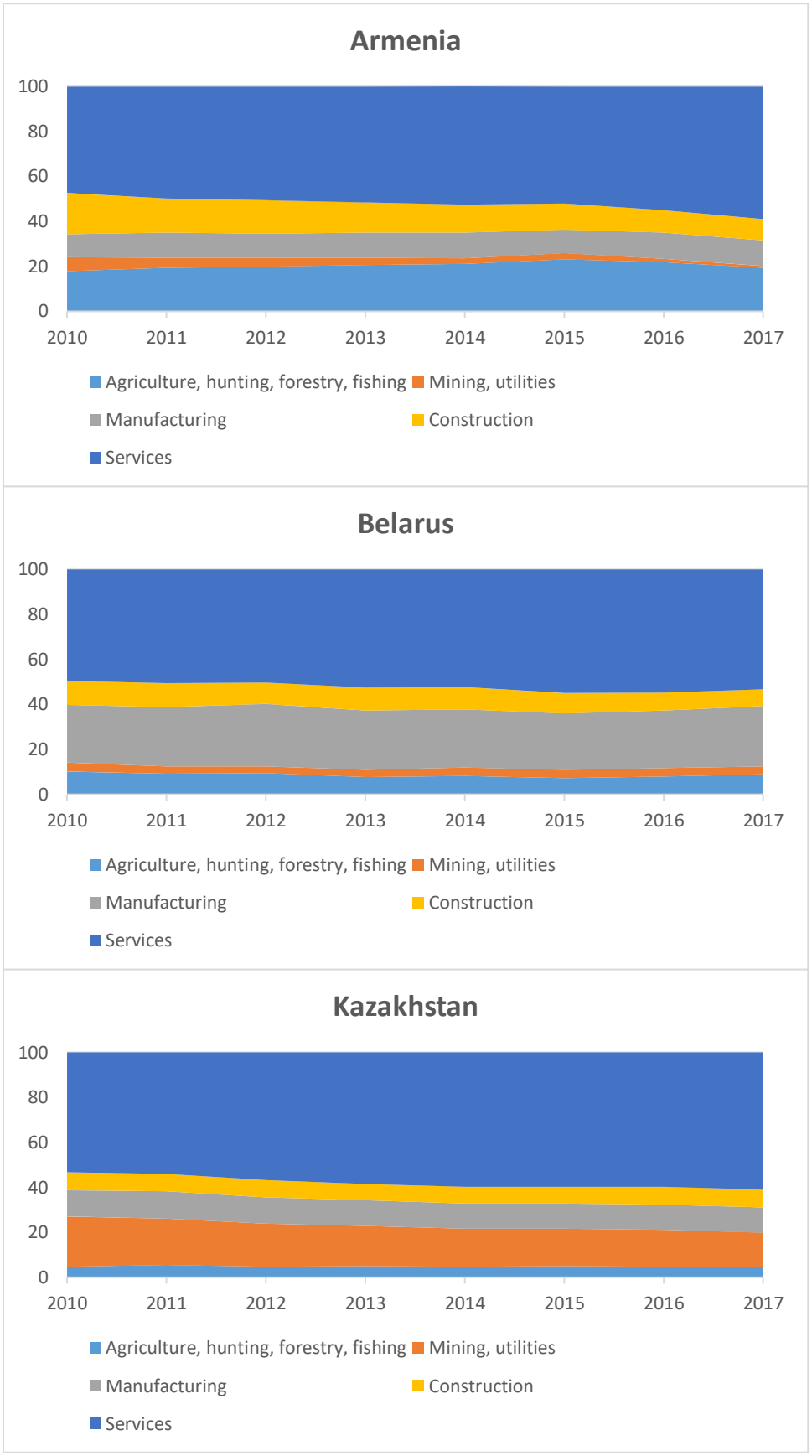
The decline in the share of industry in Armenia's GVA was attributable to the decline in in construction sector during the period analysed (USD 1,122 million in 2017 versus USD 1,614 million in 2010) as well as a decline in the mining industry (USD 105.85 million in 2017 versus USD 546.41 million in 2010). Kazakhstan witnessed an increase in the share of the services sector as a result of the extensive de-industrialization process, which expanded considerably in the EAEU countries. The GVA of the services sector now significantly exceeds that of the mining and the manufacturing sector (USD 97,495 million versus USD 48,706 million).

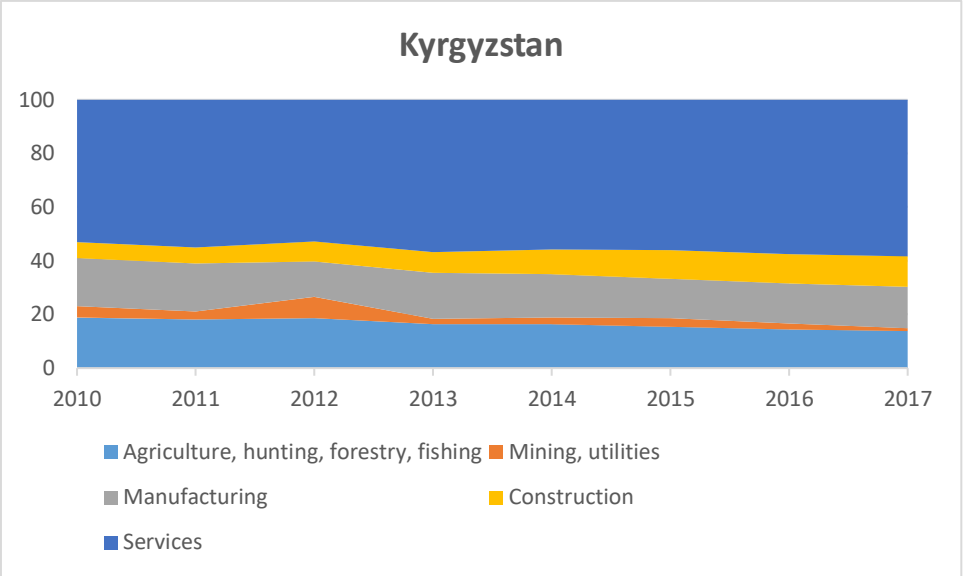
There was a modest decrease of 0.4 per cent in the share of Kyrgyzstan's industrial sector in GVA amid an increase in the share of the services sector of 5.4 per cent between 2010 and 2017. This occurred at the expense of the share of agriculture in GVA (-5 per cent). This reflects the ongoing structural change towards higher knowledge intensity within sectors.

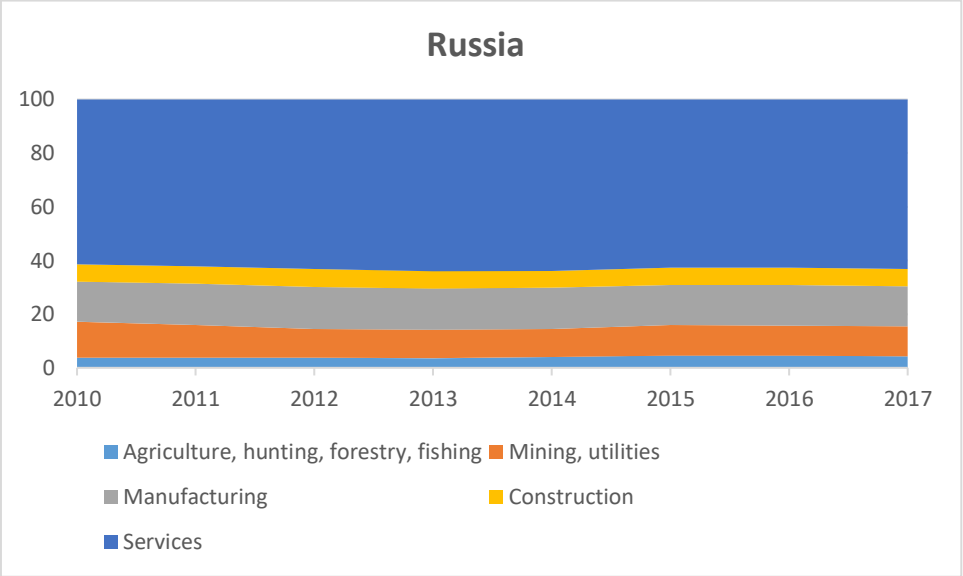
In Russia and Belarus, an overall reduction of GVA was evident in 2015–2016, resulting from the depreciation of their national currencies, with a drop in the share of the agriculture and manufacturing sectors in favour of the services sector. In accordance with the general trend in the EAEU, the GVA of the services sector in the member states significantly exceeds that of the mining and the manufacturing sectors (USD 858,128 million versus USD 377,688 million in Russia and USD 28,220 million versus USD 16,089 million in Belarus). Nonetheless, the GVA is below the 2014 level.

The economies of the EAEU countries evolved under the influence of the global energy market, which did not stimulate the diversification of industry based on new high-tech industries. Taking the industrial development of EAEU member states' manufacturing and high-tech industries into account, which are identified as priorities for the EAEU, are not the main drivers of growth. The services sector dominates the structure of GDP in all EAEU countries. The services sector's share varies from 53.28 per cent in Belarus to 63.27 per cent in Russia. The manufacturing sector ranks second, with the highest share in the economy of Belarus (37.8 per cent) and the lowest in Armenia (21.7 per cent). The share of agriculture is much lower – from 4.4 per cent in the economy of Russia to 19.3 per cent in Armenia and 13.8 per cent in Kyrgyzstan (Figure 4).

Figure 4: Structure of economic development in EAEU countries (%)







Source: UNSD Data Portal, author's calculations

The global experience shows that the higher the level of a country's economic development, the greater the share of its high-tech industries in the industrial sector, the more diversified its exports, and the more opportunities it has to maintain stable cooperation and the division of labour with countries at different levels of industrial development.

According to macroeconomic indicators, Russia's economy dominates the Eurasian Economic Union. Kazakhstan, Belarus, Armenia and Kyrgyzstan are small economies compared with Russia, since the size of their economies, domestic markets and foreign trade are significantly smaller (Gurova et al., 2018).

The industrial production index is one of the most important short-term statistics indicators. It is used to identify turning points in the economic development at an early stage and to assess the future development of a country's GDP. Industrial production refers to the output of industrial firms and covers industries such as mining, manufacturing, electricity, gas and steam and air conditioning. This indicator is measured in an index based on a reference period that expresses change in the volume of production output.

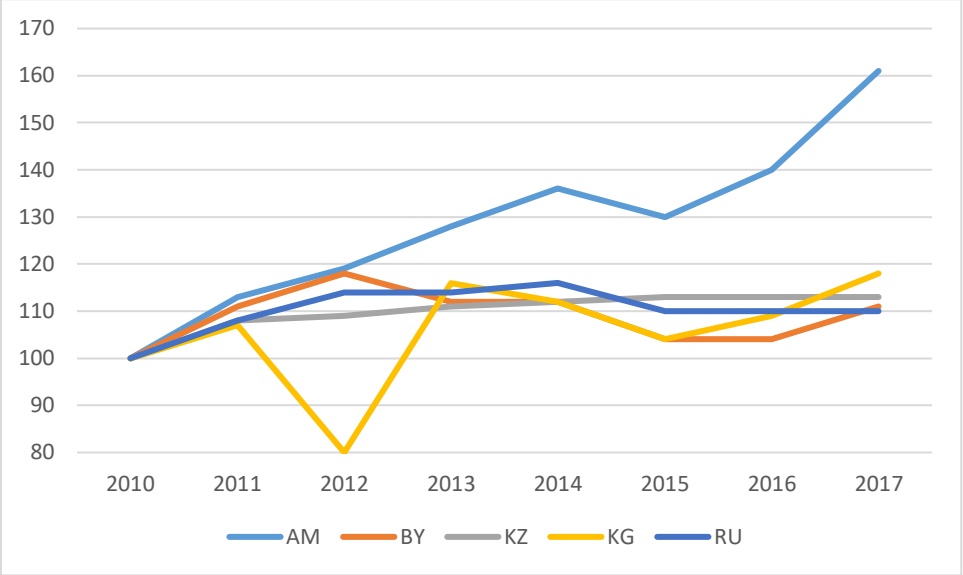
The industrial production of the EAEU countries since 2010 has been rising at a modest pace, with the exception of crises periods, which were characterized by declines. The EAEU's industrial production after the recession of 2015 triggered by the global financial crisis, which was felt in all countries of the Union, showed a steady recovery in 2016 and 2017.

Figure 5 illustrates that Kyrgyzstan was the only country in the EAEU with a dramatic drop in industrial production in 2012, due to the reduction in production of metallurgical companies. Industrial production in Kazakhstan developed at a stable pace during the period analysed. At the same time, industrial growth in Belarus and Russia remained below pre-crisis levels, and their economic development was therefore negative.

While the industrial production index of the EAEU varies between 111 and 118 points, Armenia registered its highest level in 2017, namely above 160 points. The share of industry in Armenia after joining the EAEU in 2015 has been flourishing: in 2015, its industrial production decreased by 6 points, while in 2016, it increased by 10 points, and reached a record of 21 points in 2017. Despite the fact that Armenia and Kyrgyzstan have the highest industrial production index growth rates, their contribution to the Union's overall industrial dynamics is insignificant due to small production volumes.

The increase in industrial production is gradually slowing down after successfully overcoming the economic crisis, and the EAEU member states must therefore intensify their efforts to implement measures to stimulate it to ensure further industrial development.

Figure 5: The dynamics of the industrial production index of the EAEU (2010 = 100)



Source: UNCTADstat Data Portal

3. Assessment of the manufacturing sector in the EAEU

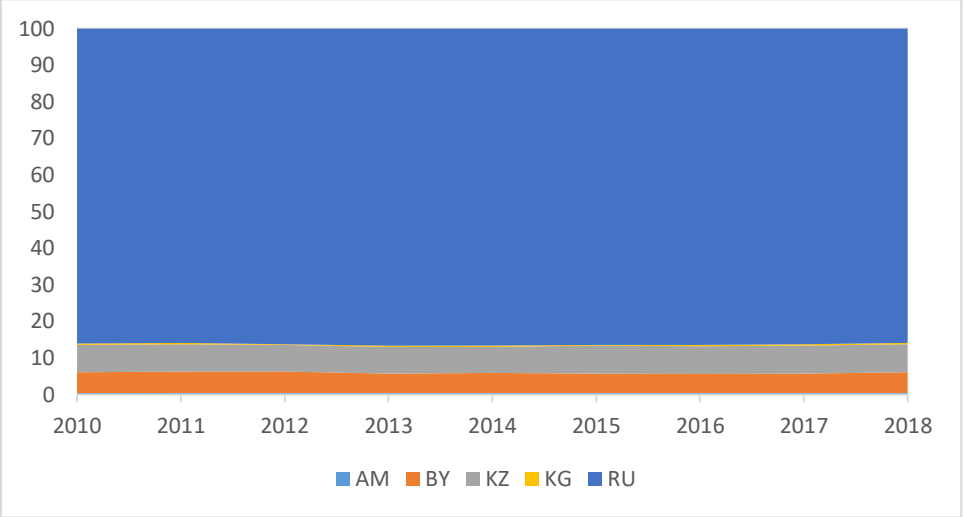
Manufacturing is considered a country's engine of economic growth. In this study, we analyse the main sources of the EAEU's countries' current industrial development by focussing on the intensity of industrialization and the distribution of the manufacturing sector's industries. Manufacturing value added (MVA) is a widely recognized indicator used by researchers and policymakers to assess the level of a country's industrialization. MVA is estimated as the total of value added of all manufacturing activities in the country. Appendix 2 presents the structure of the industries' value added of the EAEU's manufacturing sectors.

In 2018, world manufacturing production amounted to USD 13,542 billion, a decrease in the global MVA growth rate from 3.83 per cent in 2017 to 3.54 per cent in 2018. At the same time, the MVA of the EAEU increased by 0.25 per cent compared to 2017, amounting to USD 265.598 billion– i.e. 1.96 per cent of global MVA. Russia ranked first with the highest share of MVA among the five countries – USD 228.129 billion or 85.90 per cent. Russia was followed by Kazakhstan (USD 19.998 billion) and Belarus (USD 13.332 billion). Armenia and Kyrgyzstan accounted for just USD 2.241 billion (Table 4).

Despite strong MVA growth in the EAEU, Belarus and Russia have not been able to meet their highest growth rates to date of the years 2012 and 2014. Despite a marked downturn, Russia, Belarus as well as Kazakhstan account for nearly the entire MVA within the EAEU – 99.15 per cent in 2018. These three countries can be referred to as the "manufacturing triad" of the EAEU (Figure 6). As already mentioned above, the share of EAEU countries in world MVA is extremely

low – below 2 per cent. Russia accounts for the major share – 1.68 per cent, Kazakhstan – 0.15 per cent, and Belarus – 0.10 per cent. For example, China has a share of 25 per cent in world MVA, followed by the United States with a share of 15 per cent. Moreover, the concentration is very high – the top ten manufacturers account for over 70 per cent of global MVA.

Figure 6: Share of each EAEU country in total MVA of the EAEU (%)



Source: UNCTADstat Data Portal, author's calculations

SDG target 9.2 promotes inclusive and sustainable industrialization by addressing the role of manufacturing production and employment. This target comprises two measures: 1) MVA per capita as a share of GDP, and 2) manufacturing employment as a share of total employment.

The underlying notion is that industrialization is indispensable, as manufacturing is an engine of economic growth (Kaldor, 1967). Manufacturing is associated with the insertion of new and improved goods at the global level, particularly in developing and emerging industrial economies. Rapid industrial growth has played a crucial role in job creation, resulting in the absorption of surplus labour from agriculture and other traditional sectors by the industrial sector with higher wages. Similarly, industrial development has generated essential resources that can reduce poverty and improve the living conditions of society (UNIDO, 2019).

MVA as a share of GDP and MVA per capita are universally used indicators to measure progress on inclusive and sustainable industrialization. The share of MVA in GDP reflects the role of manufacturing in the economy and a country's national development in general. MVA per capita is the basic indicator of a country's level of industrialization adjusted for the size of its economy. This indicator is closely linked to a country's stage of development and is expected to change throughout the process of structural change.

Table 4: Trends in the development of MVA growth in EAEU countries (constant 2010, USD millions)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
AM	907	1019	1062	1144	1212	1146	1203	1276	1347
BY	12883	14137	14980	14253	14274	13352	13332	13900	14775
KZ	16761	17945	18486	19031	19331	19378	19505	19998	20433
KG	808	853	618	898	873	818	862	891	894
RU	195000	208000	219000	229000	230000	220000	222000	224833	228149
EAEU	226359	241954	254146	264326	265690	254694	256902	260898	265598
World	10479038	10918583	11160114	11476120	11910512	12248878	12594786	13078360	13542605

Source: UNCTADstat Data Portal, author's calculations

MVA per capita is computed as:

$$\text{MVA per capita of a country} = \frac{\text{MVA}}{Population} \quad (1)$$

MVA per capita as a component of GDP per capita can also be estimated in direct relation to GDP. MVA per capita as a derivative of GDP per capita and MVA share in GDP is given by: MVA per capita = GDP per capita × MVA share in GDP $= \frac{GDP}{Population} * \frac{MVA}{GDP} = \frac{MVA}{Population}$ (2)

The above formula synthesizes the manufacturing sector's overall role in the economy and its contribution to the population's income.

From a global perspective, world MVA has grown slightly faster than GDP, strongly influenced by a high MVA growth rate in developing and emerging industrial economies. The MVA share in GDP thus increased marginally from 15.8 per cent in 2010 to 16.4 per cent in 2018, reflecting a continuing recovery from the recent recession.

Although manufacturing production has indicated an upward trend in terms of meeting the increasing demand for goods and services, it is important to mention the role manufacturing industries play in the structure of the EAEU countries' GDP. Throughout the period analysed, the manufacturing sector's share in GDP has been steadily declining in nearly all countries of the EAEU, with the exception of Armenia, Belarus and Russia. By 2018, the manufacturing sector's share in GDP had declined from 12.6 per cent in 2010 to 10.2 per cent in the EAEU countries due to the increasing importance of the services sector.

Belarus has the highest MVA share in GDP among the EAEU countries (23.5 per cent). The manufacturing sector's contribution to GDP thus remains high. Russia and Kyrgyzstan follow with 13.6 per cent and 13.2 per cent, respectively. And finally, the MVA share in GDP of Armenia and Kazakhstan is less than 10 per cent each. This indicator has been continuously decreasing in Kazakhstan since 2010 (Table 5).

Table 5: Trends in the development of MVA share in GDP in EAEU countries (%)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
AM	9.2	9.9	9.6	10.0	10.2	9.4	9.8	9.7	9.7
BY	22.5	23.4	24.4	23.0	22.6	22.0	22.6	23.0	23.5
KZ	11.3	11.1	10.9	10.6	10.4	10.3	10.2	10.1	9.9
KG	16.9	16.8	12.2	16.0	15.0	13.5	13.7	13.5	13.2
RU	12.8	13.1	13.3	13.7	13.7	13.5	13.6	13.6	13.6
EAEU	12.6	11.0	10.6	10.5	10.3	10.6	10.6	10.4	10.2
World	15.8	16.0	16.0	16.0	16.2	16.2	16.2	16.3	16.4

Source: UNCTADstat Data Portal, author's calculations

The manufacturing sector's contraction in the EAEU in favour of goods and services does not allow for sufficient economic growth rates for long periods, increasing the economy's volatility, regardless of the given economy's industrialization process. In other words, the de-industrialization process is generally premature for all EAEU countries and restricts the possibilities of introducing large-scale industrial technologies.

An analysis of the regional features of industrial development should be carried out, taking differences in the level of national per capita income and each country's industrial potential into account. Manufacturing can create jobs that offer higher wages as a result of higher levels of productivity. Hence, the manufacturing sector plays an important role in economic growth, particularly when countries are at a relatively low income level.

Although the relative importance of manufacturing in industrialized economies is declining, the absolute value of manufacturing production is rising in all country groups. The stage of industrialization is reflected in MVA per capita (MVA per capita), which measures a country's level of manufacturing production deflated to its population size. Global MVA per capita reached USD 1,778 in 2018 compared to USD 1,509 in 2010.

The research results indicate that there has been a strong upward trend in MVA per capita growth in all of the five EAEU countries since 2010. In the period 2010–2018, the highest growth rates were registered in Armenia (45.71 per cent), whereas the growth rate in Kyrgyzstan was negative (– 2.01 per cent).

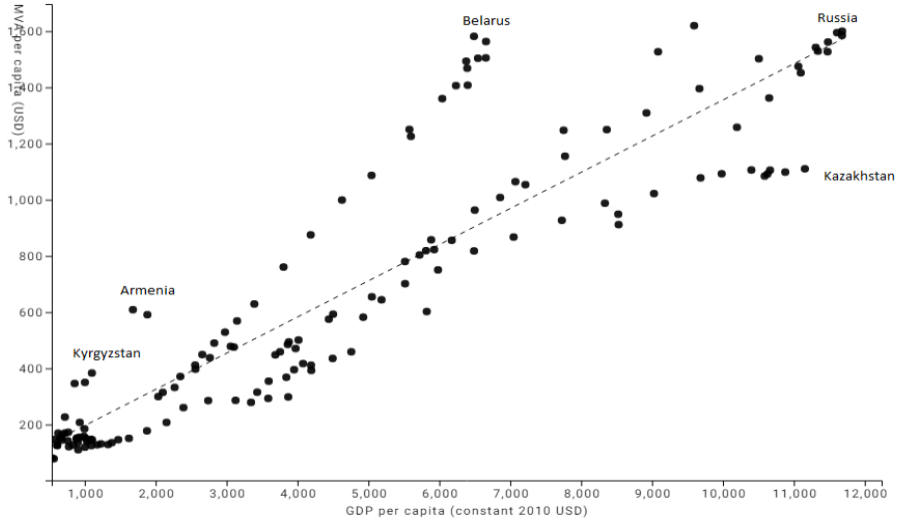
Russia leads in MVA per capita in the EAEU with an amount of USD 1,585 and an annual growth rate of 16.37 per cent during 2010–2018. Belarus ranks second (USD 1,563, i.e. 14.92 per cent annually), followed by Kazakhstan (USD 1,110, i.e. 8.61 per cent annually). Along with Kyrgyzstan, Armenia has the lowest MVA per capita. in the EAEU – less than USD 500. It is worth mentioning that the share of manufacturing in Kyrgyzstan's GDP has declined by 3.7 per cent during 2010–2018, and its MVA per capita was only USD 146 in 2018, about one-twelfth of the global share (Table 6, Figure 7).

Table 6: Trends in the development of MVA per capita growth in EAEU countries (USD)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
AM	315	354	368	395	417	393	411	435	459
BY	1360	1493	1582	1504	1505	1408	1406	1468	1563
KZ	1022	1078	1092	1106	1105	1092	1084	1098	1110
KG	149	155	110	158	151	140	145	147	146
RU	1362	1452	1527	1595	1600	1529	1542	1562	1585
EAEU	1277	1361	1425	1478	1481	1416	1425	1444	1468
World	1509	1553	1569	1594	1635	1663	1690	1736	1778

Source: UNCTADstat Data Portal, author's calculations

Figure 7: Trends in the development of MVA per capita and GDP per capita in EAEU countries (USD)



We can conclude that the manufacturing sector's contribution to the income of the population in the EAEU is comparatively high in Belarus only at 23.5 per cent (+1 per cent since 2010), while in the other four countries, it is two times lower: 13.6 per cent in Russia (+0.8 per cent), 13.2 per cent in Kyrgyzstan (-3.7 per cent), 10 per cent in Kazakhstan (-1.3 per cent), and 9.6 per cent in Armenia (+0.4 per cent).

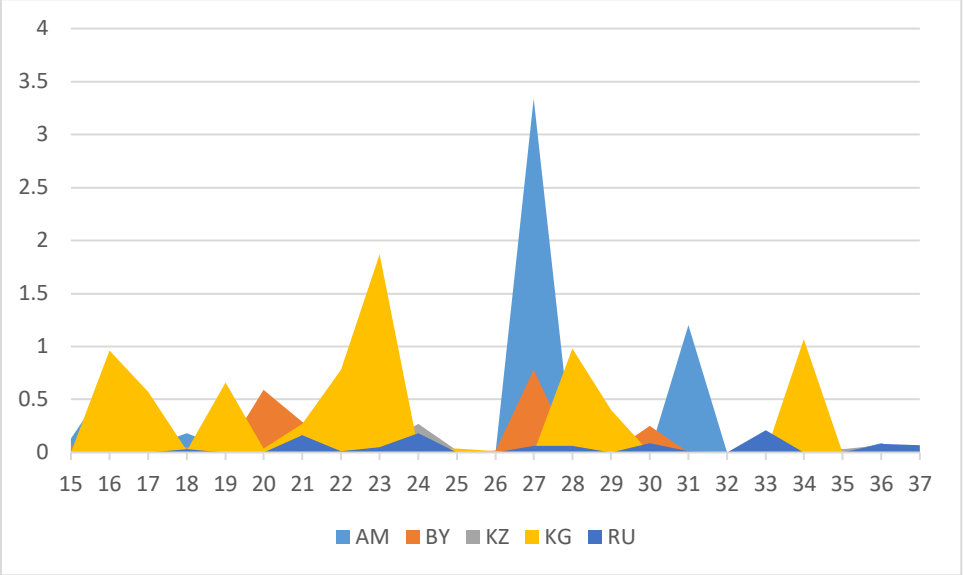
For the purpose of our analysis, we calculate the coefficient of relative structural change in MVA (d_{rel}). This coefficient shows the average deviation of manufacturing sector share in one year compared to that of the previous year:

$$d_{2rel} = \sum\left(\frac{S\,i1 - S\,i0}{S\,i0}\right)_2 \qquad (3)$$

The value of the squared difference equals zero when there is no change across all industries. Any significant change in the structure results in a higher value of the coefficient (from zero). However, this coefficient has no upper limit; thus, it cannot be defined in a range.

Appendix 2.3 presents the estimated patterns of structural change in the manufacturing sector. The figures illustrate the development of manufacturing industries (ISIC at the two-digit level) in the EAEU. According to the data, there was no sign of any structural change within the manufacturing industries in the period 2016–2017. Nevertheless, structural change was observed in the extended period of 2010–2017. Slight structural change towards capital-intensive industries in the EAEU was evident in two countries, in particular, namely Armenia and Kyrgyzstan. In Armenia, for example, the most obvious structural change occurred in the basic metals industry (3.34 per cent), followed by electrical machinery and apparatus (1.20 per cent). The structure of Kyrgyzstan's MVA changed the most within the period analysed in industries such as coke, refined petroleum products (1.87 per cent), motor vehicles (1.07 per cent), fabricated metal products (0.98 per cent), etc. In the other three countries, the coefficient of the relative structural change was less than 1 per cent (Figure 8).

Figure 8: Relative structural change by ISIC branches of the EAEU countries in 2010–2017 (%)



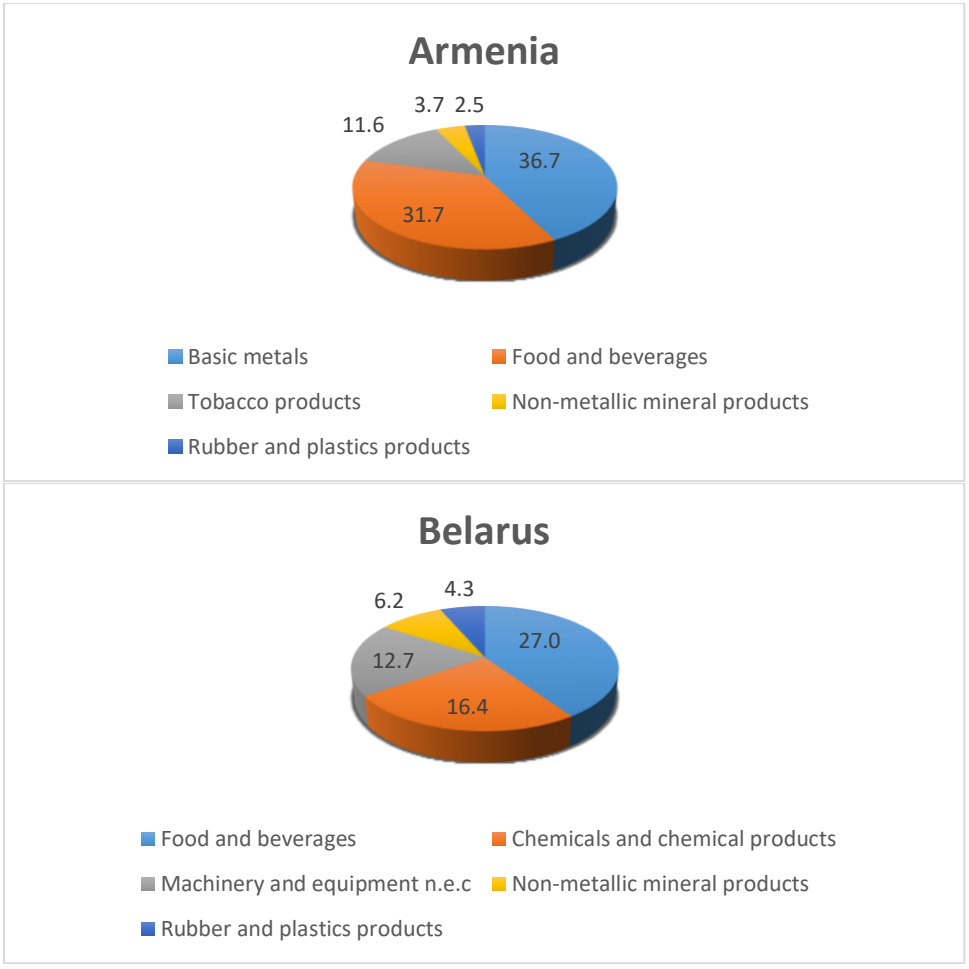
Source: UNCTADstat Data Portal, author's calculations

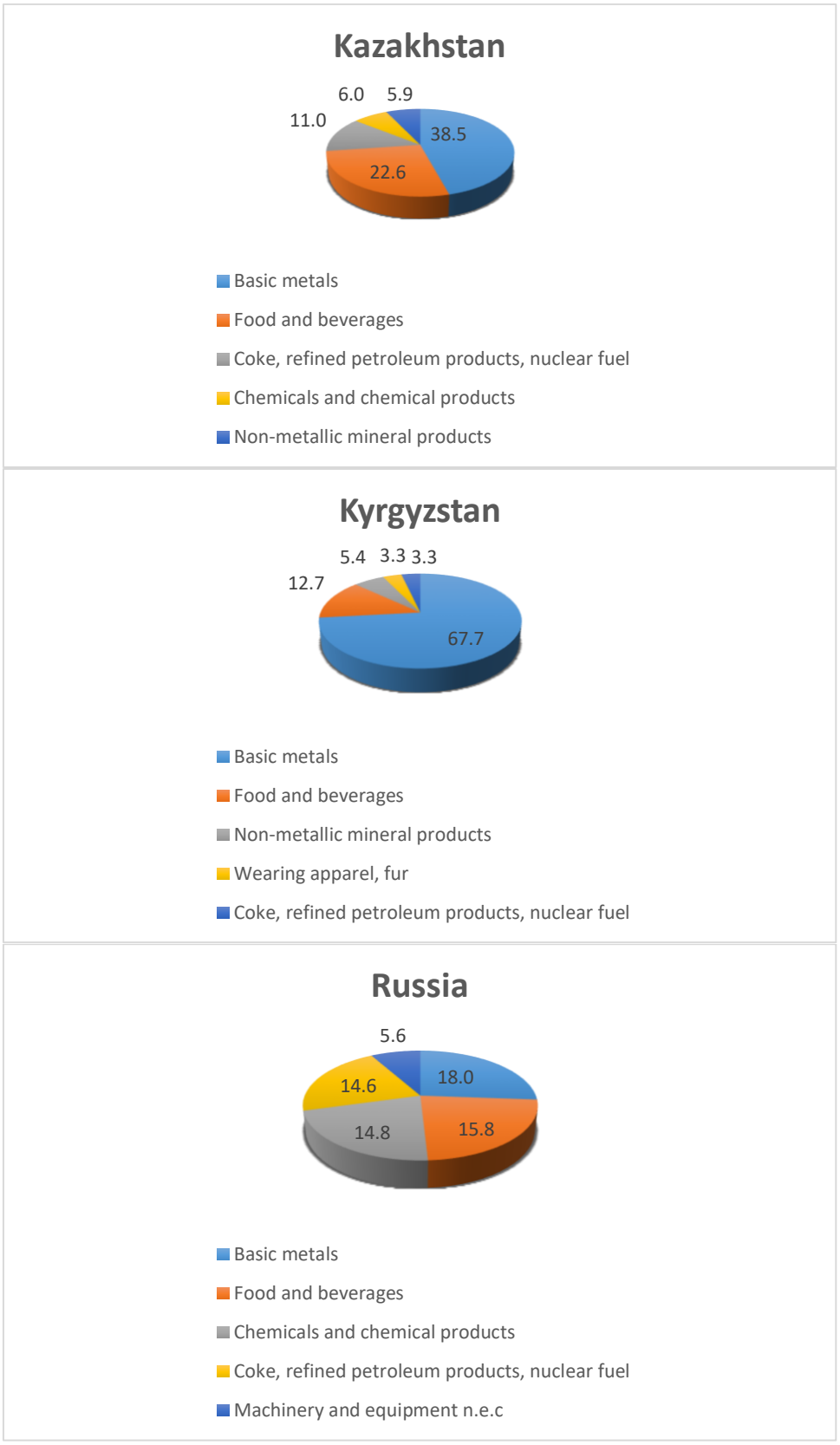
It is worth noting that lower income countries tend to focus on relatively labour-or resource-intensive activities, and higher income countries are likely to specialize in capital- or technology-intensive industries. In the first stage at a very low income level, three industries usually dominate the manufacturing sector: 1) food and beverages, 2) textile, and 3) wearing apparel. These three manufacturing industries are closely related to basic human needs and usually exist before industrialization even takes off in a country. In the second stage when countries reach a GDP per capita of around USD 10,000, many capital-intensive industries start surpassing the value added levels of the textile and wearing apparel industries. In the third stage, capital-intensive industries assume a dominant position in terms of output. All capital-intensive industries, including resource processing industries such as basic and fabricated metals, as well as those that make use of such processed materials to produce final products (including electrical machinery and motor vehicles), experience rapid growth. Finally, in the last stage at a very high income level, labour-intensive industries (with the exception of the food and beverages industry) decline, and some capital-intensive industries, such as resource processing industries, start slowing down. Industries that usually sustain a fast growth of value added are the chemicals, machinery and equipment, and the electrical machinery and apparatus industries (UNIDO, 2015).

Figure 9 presents the major manufacturing activities of EAEU countries in 2017 (VA in % of total MVA). The leading manufacturing industries in the EAEU were labour-intensive food and beverages and capital-intensive basic metals. In Armenia, for example, they accounted for nearly 70 per cent of total manufacturing value added, and in Kazakhstan for over 60 per cent. Moreover, basic metals accounted for almost 70 per cent of value added in Kyrgyzstan, while food and

beverages only contributed 12 per cent to total MVA. Other important manufacturing activities included coke and refined petroleum products, which accounted for 14.6 per cent of MVA in Russia, 11 per cent in Kazakhstan, and 3.3 per cent in Kyrgyzstan. Last, but not least, chemicals and chemical products accounted for 16.4 per cent of MVA in Belarus, 14.8 per cent in Russia and 6 per cent in Kazakhstan.

Figure 9: Major manufacturing activities of EAEU countries in 2017 (%)





Source: UNCTADstat Data Portal, author's calculations

Structural change and subsequent industrial growth lead to the diversification of production across a wide range of manufacturing activities. Least developed economies show a relatively narrow range of production and they are specialized in a few products only, often dictated by demand in the external market.

A coefficient of industrial concentration (Herfindahl-Hirschman Index) can be calculated based on the following formula:

$$HHI = \sum_{i=1}^{n} Si^2 \quad (4)$$

S – the share of the i-th activity (i = 1, ... p) in total volume.

As the economy grows and the domestic market expands, production diversifies considerably. The coefficient of diversification shows the extent to which production is spread across different manufacturing industries and is based on the share of manufacturing industries in total output. It is calculated as:

$$C_d = 1 - \sum_{i=1}^{n} Si^2 \quad (5)$$

C_d = 0 when the value is concentrated in one industry, which denotes a complete lack of diversification. C_d = 1 when all industries have an equal value, indicating perfect diversification.

It is important to note that the diversification index and the concentration index go into opposite directions, that is, the higher the concentration in the sectoral structure, the lower the level of its diversification. The value of coefficient industry diversification ranges from 0 to 1. The greater its value, the more diverse the economy's sectoral structure. A value of 0 of this coefficient indicates an industry's monostructure.

Appendix 2.4 presents the full results of the concentration and diversification indices. According to the research results, the highest levels of diversification in the structure of manufacturing activities have been recorded in Russia and Belarus, where the C_d is close to 1. There is no predominant share of any industry in these two countries, and they are less vulnerable to fluctuations. At the same time, the structure of the manufacturing sector in Kazakhstan and Armenia is more concentrated, with a predominance of several industries in total MVA. Kyrgyzstan has the least diversified manufacturing industries within the EAEU, with C_d = 0.5. Compared with 2010, there was no major change in this indicator within the EAEU (Table 7).

Table 7: Diversification of manufacturing industries in EAEU countries

	2010	2011	2012	2013	2014	2015	2016	2017
AM	0.73	0.73	0.72	0.72	0.71	0.71	0.75	0.75
BY	0.89	0.88	0.89	0.89	0.87	0.85	0.87	0.87
KZ	0.8	0.79	0.8	0.83	0.82	0.8	0.78	0.78
KG	0.52	0.51	0.71	0.71	0.6	0.57	0.52	0.52
RU	0.9	0.88	0.89	0.89	0.9	0.9	0.9	0.89

Source: Author's calculations

It must be mentioned that the Industrial Statistics Guidelines (UNIDO, 2010) present several groupings of manufacturing industries which include a technology classification developed on the basis of the computation of the Competitive Industrial Performance (CIP) index.

All classifications of manufacturing production should be considered conditional in terms of international competitiveness, and all types of industrial activity, regardless of their level of technology, should be technologically upgraded continuously. According to Lall, "there is no activity that would have immunity to technical changes" (Lall, 2000).

To illustrate the relationship between structural change and technological development, we take a look at structural change among manufacturing industries, grouped by technological category: low-tech, medium low-tech, medium high- and high-tech.

According to the UNIDO classification of countries by global income groups, the five EAEU countries represent different groups depending on their GDP per capita:

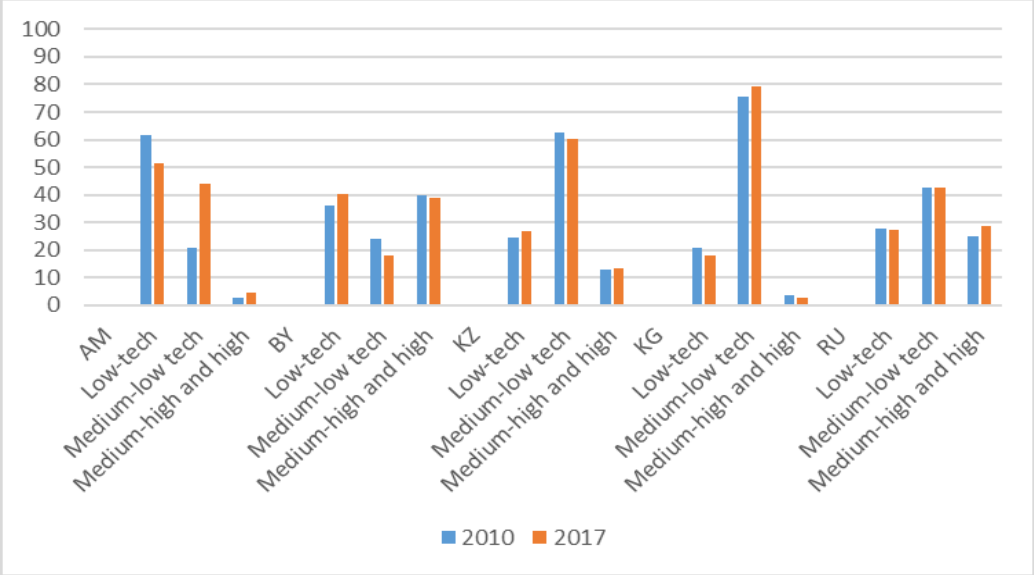
1. Emerging industrial and industrialized economies:
   - Higher income (Russian Federation, Belarus),
   - Middle income (Kazakhstan),
2. Other developing economies:
   - Low income (Armenia, Kyrgyzstan).

Industrialized and developing economies display wide differences in the way manufacturing drives economic growth. In developing countries, contributions to output growth mainly derive from capital investments, natural resources and energy; in industrialized countries, they come from productivity. High-income countries seem to use labour- and resource-saving technology which allows them to increase output without significantly increasing factor inputs. Consider the three groupings of manufacturing industries—low-tech, medium low-tech, medium high- and high-tech—to assess how their production characteristics affect overall growth and factor

contributions along country income lines. Decomposing structural change into two parts—one related to productivity change (indicating technological change or total factor productivity(TFP)) and one to changes in the use of inputs (capital and labour)—allows for an assessment of which part of structural change is a direct result of technological change (UNIDO, 2016).

Appendix 2.5 presents the distribution of activities according to the technological structure of the EAEU countries' manufacturing sector. The main assumption of this division of industrial activities is sufficiency and availability of a constant set of comparable data at the 2-digit level of their ISIC disaggregation over a long period as reference to the sectoral technological complexity and subsequent diagnostics of industrial development.

Figure 10: Technological structure of manufacturing value added in EAEU countries (%)

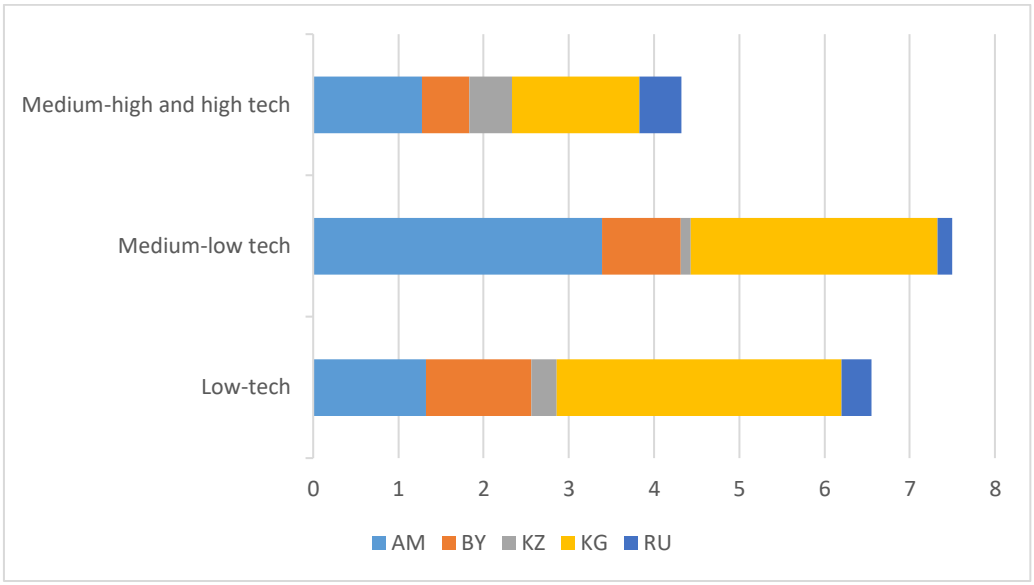


Source: UNCTADstat Data Portal, author's calculations

According to Figure10 data, medium low-tech industries dominated the technological structure of the manufacturing sector in EAEU countries (49 per cent) in 2017, mostly due to the value added of basic metals. The situation in Armenia and Belarus was not the same, however. Low-tech industries dominated the technological structure in these countries. Nevertheless, the share of medium low-tech industries in Armenia has been continuously increasing since 2010, and amounted to 44.09 per cent in 2017. At the same time, low-tech industries had a larger share of 51.28 per cent, primarily due to the food and beverages industry. In Belarus, low-tech industries were leading as well (43.12 per cent in 2017) due to the high value of the food and beverages industry as well as textiles. Finally, medium high- and high-tech industries ranked third due to the contribution of chemicals and chemical products, and machinery and equipment (18 per cent in 2017).

Taking into account the classification of countries into global income groups, we can conclude that the productivity of low-tech industries contributed less to the growth of labour-intensive industries, which is common in developing countries. At the same time, the main contribution in the medium low-tech group came from natural resources and energy, with productivity growth making only a small contribution. And finally, industrialized countries with a high income have relatively good positions in medium high- and high-tech industries and should further develop these industries to achieve sustainable long-term growth.

Figure 11: Relative structural change by technological structure of MVA of the EAEU countries in 2010–2017 (%)



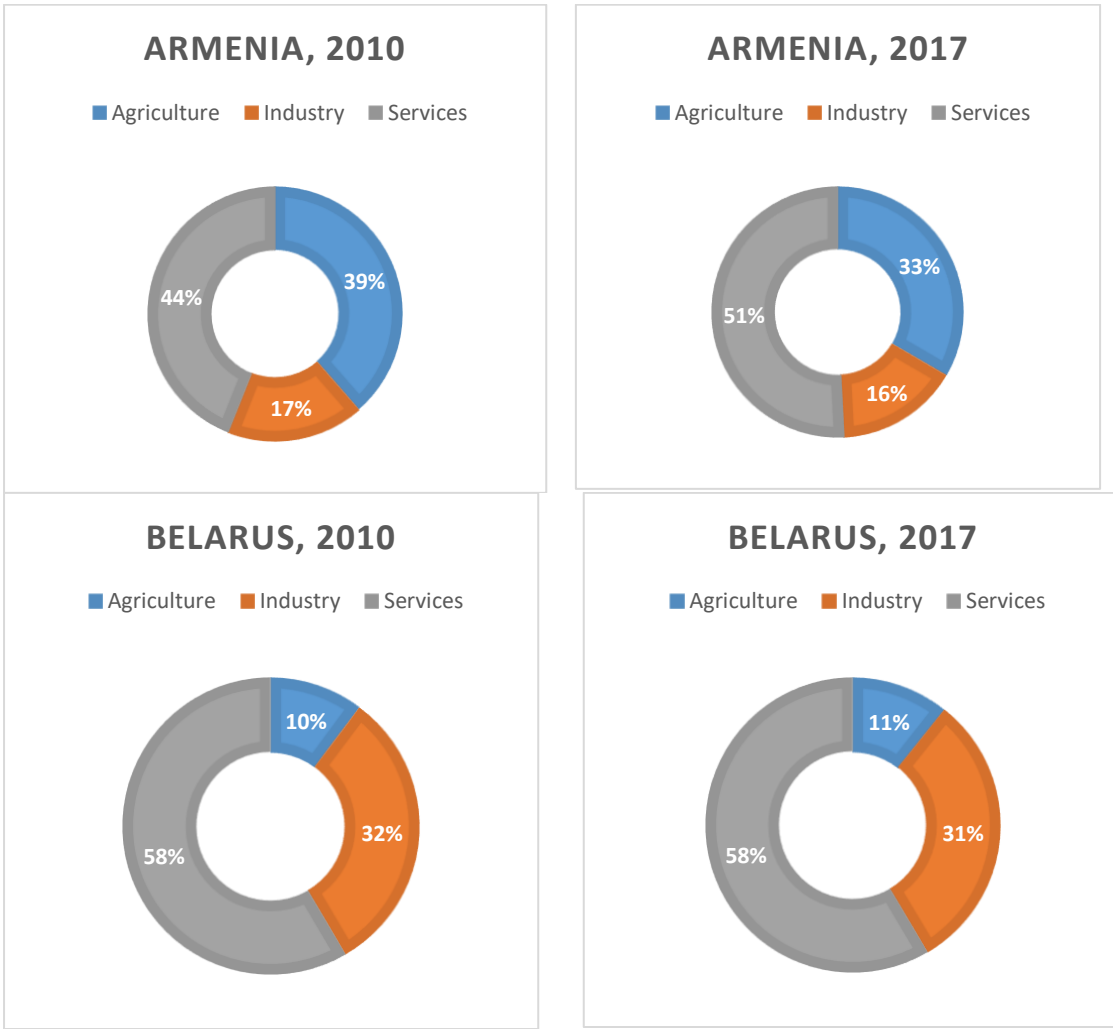
Source: UNCTADstat Data Portal, author's calculations

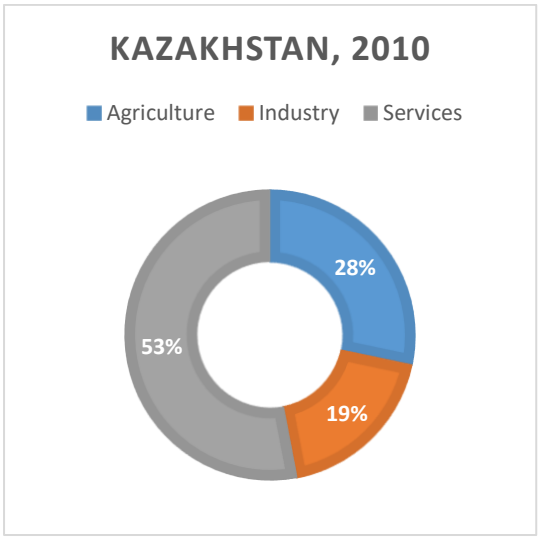
For the purpose of our analysis, we also calculated the relative structural change in industries according to technology. Figure 11 illustrates that structural change in the EAEU occurred primarily in medium low-tech industries, mainly due to Armenia's (3.39 per cent) and Kyrgyzstan's values (2.9 per cent). Amid a slight structural change in Russia and Kazakhstan towards capital-intensive, medium high- and high-tech industries (0.5 per cent each), Belarus's MVA is changing towards labour-intensive, low-tech industries (1.24 per cent); this should be taken into account when developing industrial policy.

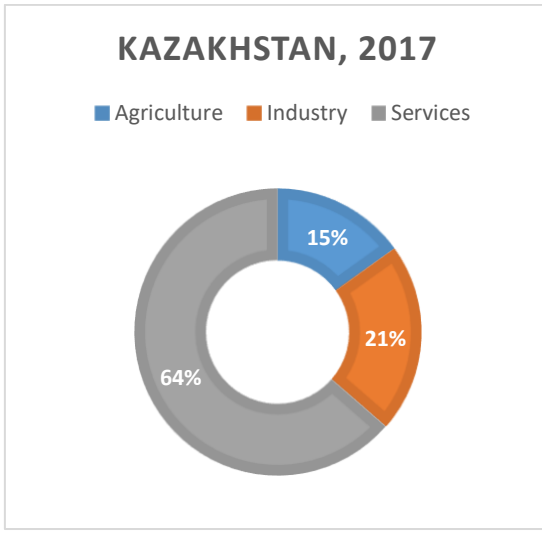
4. Assessment of manufacturing employment in the EAEU

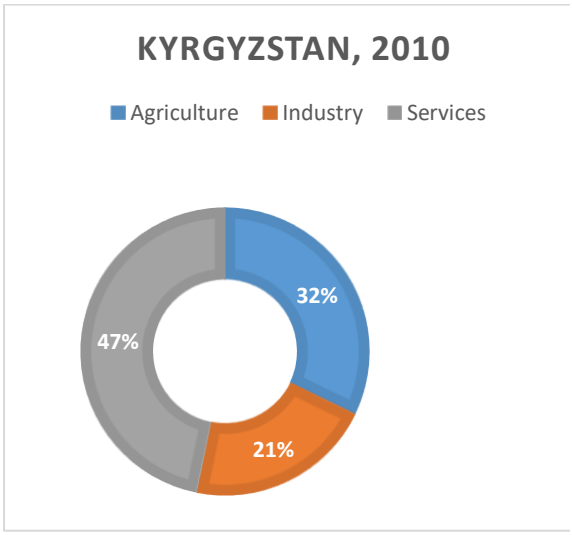
The change in GDP structure by main type of economic activity is accompanied by a change in the structure of employment. In many developed countries, the share of manufacturing employment decreased while employment in services increased. If we take a look at employment composition by industry, we find that the majority of jobs in all EAEU countries is concentrated in the services sector (Figure 12). This trend practically increased in all countries during the period analysed, except in Belarus. There were no indications of expanding employment in the industrial sector, except in Kazakhstan and Kyrgyzstan since 2010, which was the result of these countries' industrial policies to support labour-intensive industrialization. We can conclude that industry is not the main source of new jobs in the EAEU member states. At the same time, the increasing role of the services sector for employment could significantly affect employment in the manufacturing sector because of an increase in different services closely related to the manufacturing sector (financial services, transport services, wholesale trade, etc.).

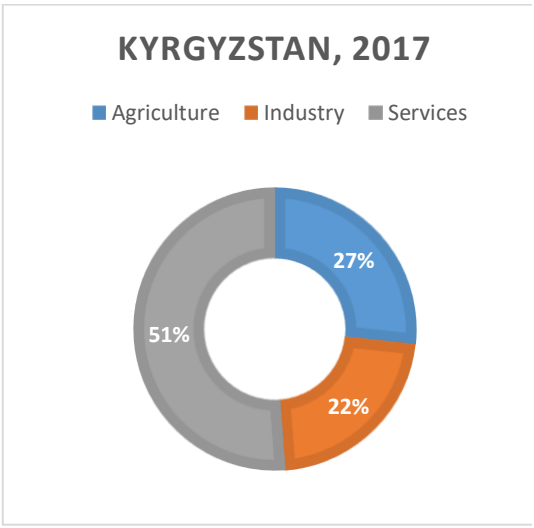
Figure 12: Employment distribution by economic activity in the EAEU countries (%)

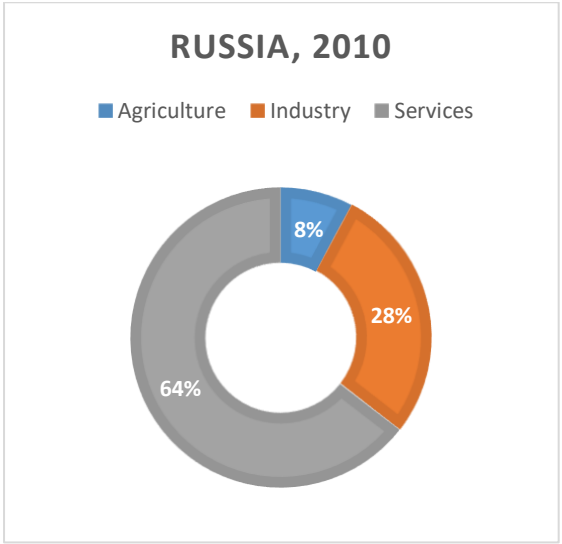












Source: ILOSTAT

Countries with a higher level of technological development, offer greater potential for employment generation due to the expansion of jobs in the manufacturing sector as a whole, as well as in the services sector related to industrial activities. In countries with a low per capita level of industrial potential, more extensive deployment of non-capital-intensive and labour-intensive industries allows for an increase in employment generation.

However, the share of manufacturing employment in total employment and the absolute number of manufacturing jobs generally fall in high-income countries. On average, countries across all income levels now have a lower manufacturing share than before, and they reach their peak employment and value-added shares at a lower income level than in previous decades (Rodrik 2015; Ghani and O'Connell 2014).

The expansion of technology inevitably affects and transforms employment opportunities. Advanced manufacturing such as automation, robotics and digitalization have triggered a debate about their long-term effects on employment. In a long-term perspective, job creation may shift towards higher skill jobs, especially in service-based activities that support manufacturing. Furthermore, new jobs can be created by transitioning towards a circular economy which includes activities such as recycling, repair, rent and remanufacturing, i.e. replacing the traditional economic model of "extracting, making, using and disposing" (ILO, 2018).

The indicator 'share of manufacturing employment in total employment' covers the second dimension of Target 9.2 and describes the relative importance of manufacturing employment in total employment. In theory, the labour intensity of manufacturing increases at the early stage of the industrialization process, followed by a steady decline as a result of structural change (UNIDO, 2019).

In 2017, only 14 per cent of the world's working population was employed in manufacturing. The share of manufacturing employment is declining, as economies gradually develop and is reallocated from agriculture and industry to services. Global manufacturing employment was estimated at about 472 million in 2017 (ILO, 2019). Compared to previous years, the total number of manufacturing jobs has continued to increase, but the pace of growth has slowed down due to the process of structural transformation.

In 2017, total employment in the manufacturing sector of the five EAEU countries was 4.61 per cent of their total population. The EAEU's manufacturing sector employed 8.33 million people, amounting to 0.24 per cent of the world's working population. Evidently, there was a strong decline in this indicator throughout the EAEU. In the period 2010–2017, manufacturing employment in the EAEU decreased by 10.06 per cent. Employment in manufacturing decreased

particularly in Armenia (-22.64 per cent), Kazakhstan (-22.02 per cent) and Belarus (-14.55 per cent).

In the EAEU countries with a higher and middle per capita income (Russia, Belarus, Kazakhstan), employment in the manufacturing sector decreased to 8.23 million people in 2017 from 2010, exceeding the level of employment in the manufacturing sector of countries with a low national income level (Armenia, Kyrgyzstan) 85 fold (Table 8).

The level of manufacturing employment in total employment in the EAEU was only high (namely over 18 per cent) in Belarus, while it remained below 10 per cent in all other countries, except Russia (14.2 per cent). At the same time, along with a decrease in the development of manufacturing employment in the EAEU, its share in total employment fell during 2010–2018 in all countries, except Armenia and Kyrgyzstan (Table 9).

It is presumed that if the manufacturing sector's share contributes less than 30 per cent to GDP, and if the share of those employed in the manufacturing sector is less than 5 per cent of total employment, the economic benefits supporting long-term growth will be difficult to implement (UNIDO, 2015). According to our research, the share of the manufacturing sector in the EAEU's GDP lies above the mentioned indicator (34.36 per cent), while the share of those employed in the manufacturing sector varies considerably within the EAEU, but on average, also remains higher than the indicated figure.

In Russia, the manufacturing sector's share (M_{sh}) in GDP in 2017 was 33.3 per cent and the share of manufacturing employment in total employment (Mem_{sh}) was 14.2 per cent. Belarus was the frontrunner in both indicators – 37 per cent and 18.4 per cent, respectively. In Kazakhstan, M_{sh} in GDP was 34.1 per cent, and Mem_{sh} was higher than 6 per cent. Armenia and Kyrgyzstan are the only two countries that have not yet reached one of the indicators mentioned above. M_{sh} in GDP in these two countries was less than 30 per cent (27.6 per cent in Armenia and 29.6 per cent in Kyrgyzstan), while Mem_{sh} was above the indicated 5 per cent (9.1 per cent in Armenia and 10.1 per cent in Kyrgyzstan). All EAEU countries are able to achieve sustainable long-term industrial growth.

Table 8: Trends in the development of manufacturing employment in EAEU countries

	2010	2011	2012	2013	2014	2015	2016	2017
AM	71500	51266	51122	51221	51664	49471	47888	55311
BY	942601	944060	930342	909172	862418	789075	753450	805438
KZ	399124	403499	375861	375194	367310	332329	303534	311211
KG	45017	44513	43214	43505	41491	40442	38753	41698
RU	7810079	7774433	7622555	7531002	7309608	7159207	7032513	7122264
EAEU	9268321	9217771	9023094	8910094	8632491	8370524	8176138	8335922

Source: UNCTADstat Data Portal, author's calculations

Table 9: Share of manufacturing employment in total employment in EAEU countries (%)

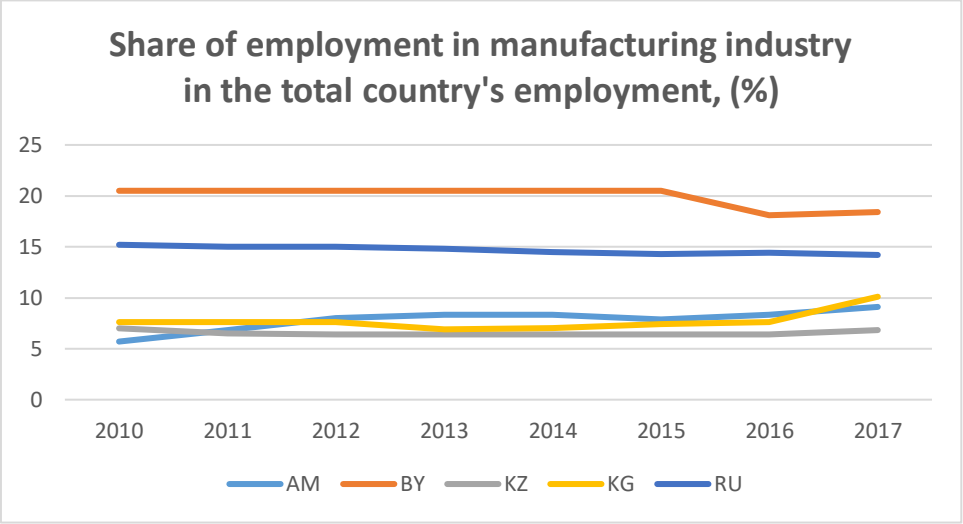
	2010	2011	2012	2013	2014	2015	2016	2017
AM	5.7	6.8	8	8.3	8.3	7.9	8.3	9.1
BY	N/A	N/A	N/A	N/A	N/A	20.5	18.1	18.4
KZ	7	6.5	6.4	6.4	N/A	6.4	N/A	6.8
KG	N/A	N/A	7.6	6.9	7	7.4	7.6	10.1
RU	15.2	15	15	14.8	14.5	14.3	14.4	14.2

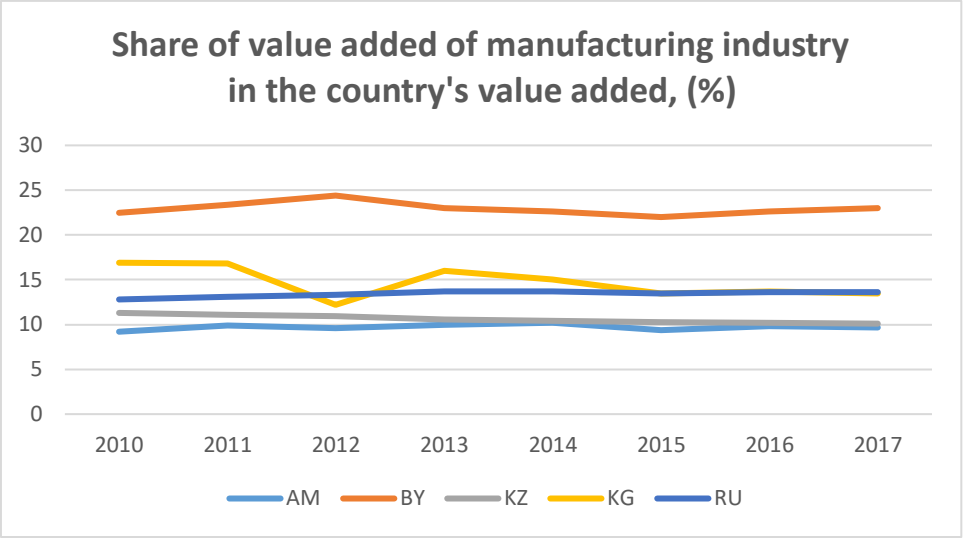
Source: ILOSTAT

A shift of employment towards the services sector, bypassing the manufacturing stage of development, can lead an economy into the trap of a structural change process with the adverse consequence of premature de-industrialization and lagging behind, even in the process of catching-up. At the same time, in the countries of the region with a high potential for modernization and industrialization, a slowdown in the dynamics of employment in the manufacturing sector could be accounted for by structural change within the sector, which can point to a more marked concentration of production in capital-intensive industries and a general increase in capital intensity.

If we consider structural change in the manufacturing sector from the perspective of employment flows, the shift of jobs to manufacturing from other sectors of the economy, and analyse the dynamics of industrial contribution to total employment, we find that Belarus and Russia are the only countries within the EAEU that can benefit from the industrialization process in terms of potential for further modernization of the national economy. Despite a decline in manufacturing employment, the countries' MVA share in GDP is rising, and this is an indication of an increase in labour productivity (Figure 13).

Figure 13: The dynamics of structural change in value added and employment in the manufacturing sector of the EAEU countries (%)





Source: ILOSTAT, UNCTADstat Data Portal, author's calculations

To what extent the expansion of the manufacturing sector generates productive employment can be determined by assessing its elasticity based on GVA. The employment intensity of growth, or the elasticity of employment with respect to output, is based on the recommendations of the International Labour Organization (ILO). The most basic definition of employment elasticity is the percentage change in the number of employed persons in an economy or region associated with a percentage change in economic output, measured by GDP (Kapsos, 2005).

In this study, the elasticity of employment indicator is defined as the ratio of the compound annual growth rate of employment in a given industry to similar growth rates of GVA of that industry. It determines how employment varies over the year on average as a result of a 1 per cent change in GVA. Positive elasticity ($\varepsilon > 1$) determines the dominance of the value added of labour-intensive manufacturing industries in the economic structure. Negative elasticity ($\varepsilon < 0$) implies that the industry's expansion is accompanied by a reduction in manufacturing employment, and intensive employment growth together with a decline in GVA is defined as unproductive. In case of more moderate growth of employment compared to GVA, the generation of employment can be deemed to be moderate or low.

According to the data in Table 10, there was a strong negative value of employment elasticity in the manufacturing sector amid a positive increase in GVA in the period 2010–2017 in all EAEU countries. This has led to an increase in unemployment as well as labour productivity growth. In 2015–2017, the situation improved and employment increased in all countries, with the exception of Kazakhstan and Russia, accompanied with a positive average annual increase in GVA throughout the EAEU. In 2016–2017, there was a strong rise in employment elasticity amid a

slowdown in GVA growth rates. This provoked an expansion of employment and thus a decline in the EAEU's labour productivity.

Overall labour productivity of any given economy can be proxied by MVA per employee. It indicates the average amount of value added produced by an employee.

$$\text{Value added per employee} = \frac{Value\ added}{Number\ of\ employees} \quad (6)$$

This relationship can also provide a rough estimation of the expected number of employees required to produce the given amount of MVA at different levels of productivity. According to our analysis, production of MVA equivalent to USD 1 million required 15.56 employees in Kazakhstan in 2017, 31.68 employees in Russia, 43.36 in Armenia, 46.80 in Kyrgyzstan, and 57.94 employees in Belarus amid its increase in labour productivity. Nevertheless, all five countries' value added per employee increased since 2010 (Table 11).

The growth of value added over time depends on the change in the quantity and value of goods and services produced. To measure the real change in productivity, the index of labour productivity as a ratio of the production index can be calculated, which denotes the growth in the volume of production relative to the index of the number of employees:

$$\text{Index of labour productivity} = I_{LP} = \frac{Iq}{Il} * 100 \quad (7), \text{ where:}$$

I_Q and I_L = index of industrial production and the number of employees, respectively, for the given period.

Table 10: Employment elasticities and value-added growth rates in the manufacturing sector of EAEU countries (%)

	Employment elasticity			GVA growth rates			Classification of industrial activity		
	2010-2017	2015-2017	2016-2017	2010-2017	2015-2017	2016-2017	2010-2017	2015-2017	2016-2017
AM	-22.64	11.80	15.50	40.68	11.34	6.06	Unemployment growth	Expansion of employment	Expansion of employment
BY	-14.55	2.07	6.89	7.89	4.10	4.26	Unemployment growth	Low employment	Expansion of employment
KZ	-22.02	-6.35	2.52	19.31	3.19	2.52	Unemployment growth	Unemployment growth	Expansion of employment
KG	-7.37	3.10	7.59	10.27	8.92	3.36	Unemployment growth	Low employment	Expansion of employment
RU	-8.80	-0.51	1.27	15.29	2.19	1.27	Unemployment growth	Unemployment growth	Expansion of employment

Source: Author's calculations

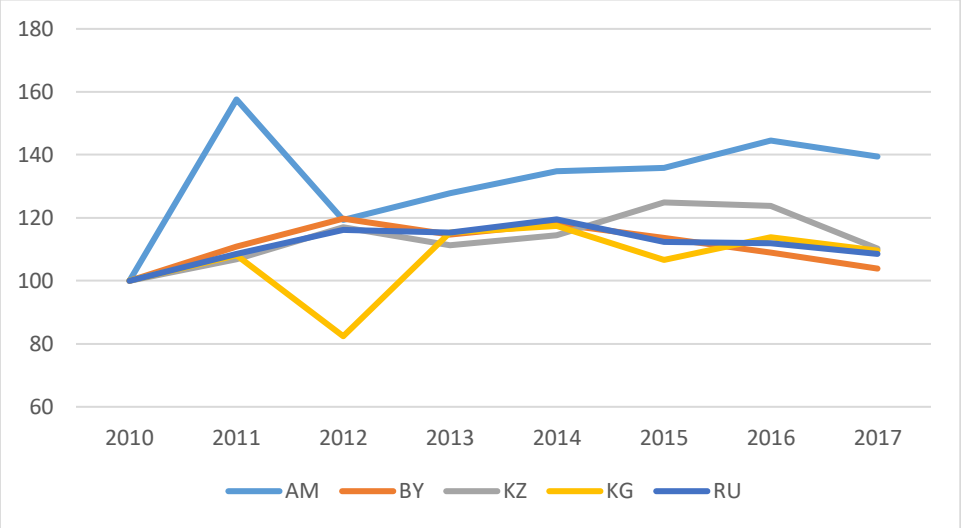
Table 11: Value added per employee in the EAEU countries (USD)

	2010	2011	2012	2013	2014	2015	2016	2017
AM	12685.31	19876.72	20773.84	22334.59	23459.28	23165.09	25121.12	23069.55
BY	13667.5	14974.68	16101.61	15676.9	16551.14	16921.08	17694.6	17257.69
KZ	41994.47	44473.47	49183.08	50723.09	52628.57	58309.69	64259.69	64258.65
KG	17948.77	19162.94	14300.92	20641.31	21040.71	20226.5	22243.44	21367.93
RU	24967.74	26754.36	28730.52	30407.64	31465.44	30729.66	31567.66	31567.63
EAEU	24422.87	26248.65	28166.17	29665.9	30777.91	30427.49	31420.95	31298.04

Source: UNCTADstat Data Portal, author's calculations

Since its inception in 2015, the EAEU's level of labour productivity increased by 4.54 per cent. But in 2017, the level of productivity decreased throughout the Union. According to our data, in the period 2010–2017, Armenia registered the greatest increase in the level of labour productivity (+39.39 per cent). Kazakhstan's level of labour productivity improved to 10.21 per cent, Kyrgyzstan's to 9.67 per cent, Russia's to 8.61 per cent and Belarus's to 3.84 per cent (Figure 14).

Figure 14: The dynamics of labour productivity index of the EAEU countries (%)



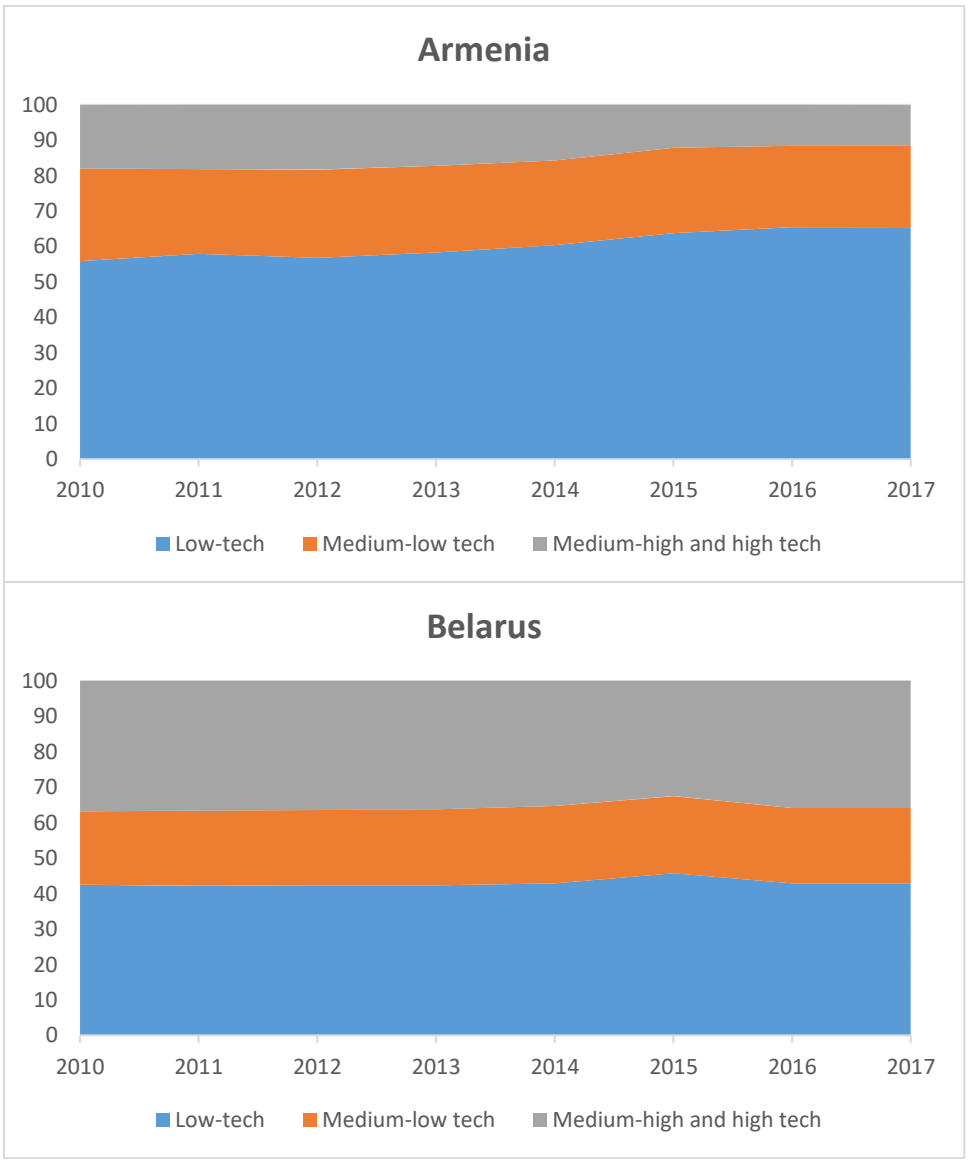
Source: UNCTADstat Data Portal, author's calculations

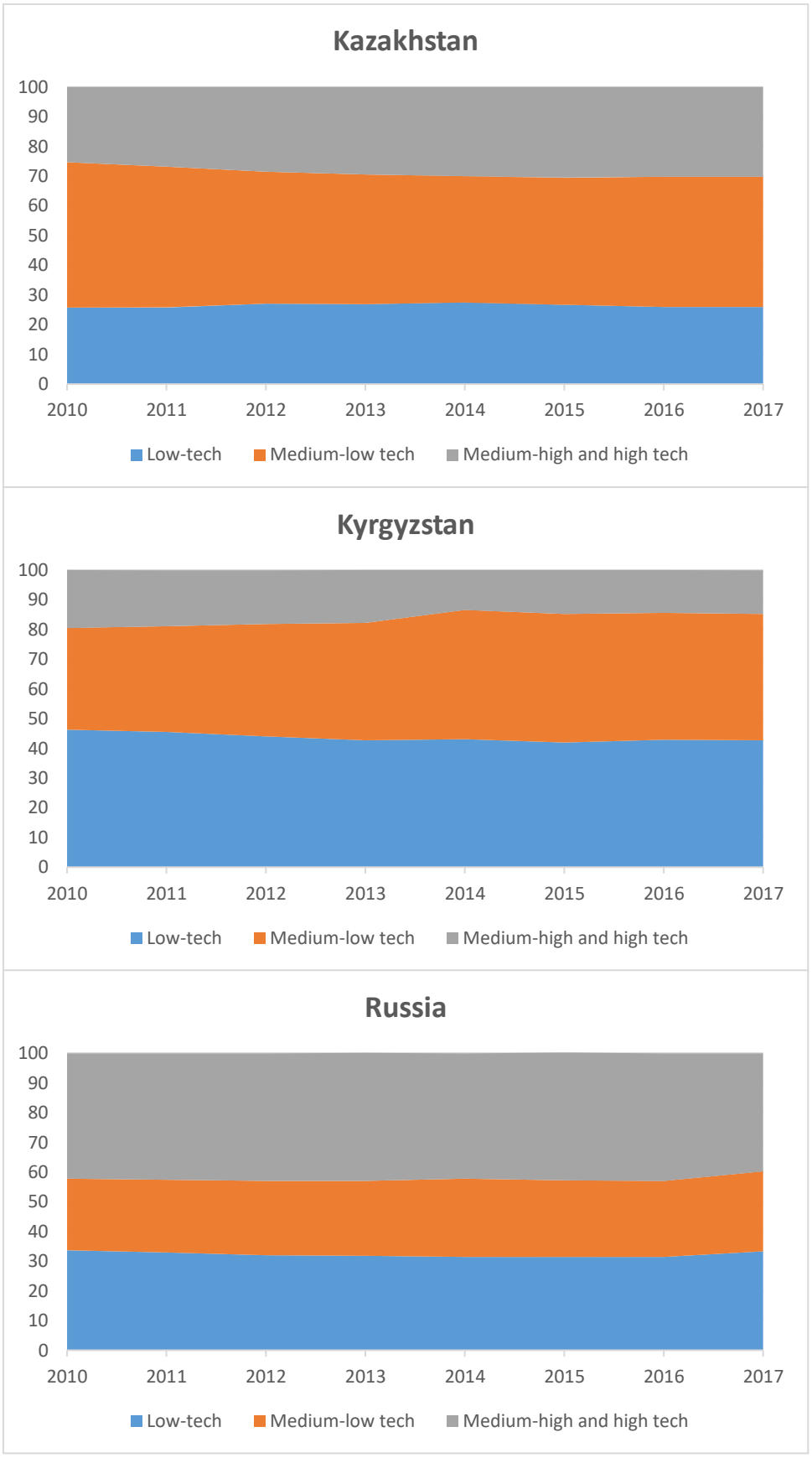
The composition of employment in the EAEU's manufacturing sector varies considerably (Appendix 3). In countries with the highest industrial potential per capita (Russia, Kazakhstan and Belarus), employment in medium- and high-tech industries increased by 5.4 per cent since 2010, amounting to 5.44 million people in 2017, while in similar industries in Armenia and Kyrgyzstan, employment decreased by 22.8 per cent to 42,991 people only, amounting to 0.78 per cent of total employment in medium- and high-tech industries of the EAEU's manufacturing sector. In countries with a substantial contribution of medium- and high-tech industries to the manufacturing sector's aggregate value added (Russia, Kazakhstan and Kyrgyzstan), employment in these industries amounted to 5.0 million people or 60.08 per cent of total manufacturing employment in 2017.

In countries dominated by low-tech manufacturing industries (Armenia and Kyrgyzstan), employment in such industries amounted to 54,016 in 2017, accounting for 1.9 per cent of total employment in low-tech manufacturing industries in the EAEU. Meanwhile, in countries with a substantial share of low-tech industries in the manufacturing sector's aggregate value added (Armenia, Belarus), employment in these industries amounted to 382,396 people or 4.58 per cent of total manufacturing employment in 2017.

According to data in Figure15, employment in low-tech industries dominated the structure of manufacturing activity in 2017 (41.9 per cent compared to 40.8 per cent in 2010), mostly due to the high level of employment in the food and beverages industry. Armenia is the only country in the Union that registered a continuous increase in the share of employment in low-tech industries during the period analysed. It increased from 55.89 per cent in 2010 to 65.43 per cent in 2017. In other countries, the share of employment in low-tech industries remained the same or fell slightly. For example, it was 42.98 per cent in Belarus in 2017 (+0.47 per cent compared to 2010), 42.76 per cent (-3.52 per cent) in Kyrgyzstan, 33.25 per cent (-0.4 per cent) in Russia, while the share of employment in low-tech industries was lowest in Kazakhstan at 25.87 per cent (+0.03 per cent). Medium low-tech industries ranked second with a share of 31.5 per cent in 2017 (30.8 per cent in 2010), due to the high contribution of metals and mineral products to employment. In all EAEU countries, the contribution of such industries to manufacturing employment is less than 32 per cent, with the exception of Kazakhstan and Kyrgyzstan, with shares of 43.9 per cent and 42.4 per cent, respectively. Finally, medium high- and high-tech industries ranked third due to the contribution of the following industries to manufacturing employment: chemicals and chemical products, machinery and equipment. Within the period analysed, the share of manufacturing employment in these industries rose to 26.5 per cent in 2017 compared to 25.9 per cent in 2010. The share of manufacturing employment in medium high- and high-tech industries in 2017 was only high (30 per cent to 40 per cent) in Russia (39.8 per cent), Belarus (35.9 per cent) and Kazakhstan (30.3 per cent), while it remained below 15 per cent in the other two countries.

Figure 15: The dynamics of employment in certain types of manufacturing activity of the EAEU countries (%)





Source: UNSD Data Portal, author's calculations

5. Assessment of manufacturing exports in the EAEU

All countries can benefit from international trade. The theory of absolute and comparative advantages in foreign trade was formulated by Adam Smith (1776) and supplemented by David Ricardo (1817). According To Ricardo's theory, “a country should export those goods that it produces at the lowest cost relative to other goods, although these costs can be higher than in other countries”. The essence of the theory of absolute advantage is as follows: if a country can produce a particular product more and cheaper than other countries, it has an absolute advantage.

Based on this theory, foreign trade always remains profitable for both sides. As long as differences exist between countries in domestic price ratios, each country will have a comparative advantage, that is, each country will always find such a product, the production of which is more profitable under the existing cost ratio than under others. The gain from the sale of products will be greatest when each product is produced by a country with the lower opportunity costs.

The total volume of merchandise trade of the EAEU countries reached USD 870.77 billion in 2018. Imports amounted to USD 320.75 billion and exports to USD 550.02 billion. The trade surplus amounted to USD 229.27 billion. Compared to 2010, turnover increased by 12.14 per cent or USD 94.28 billion, exports by 14.17 per cent (USD 68.29 billion) and imports by 8.81 per cent (USD 42.30 billion).

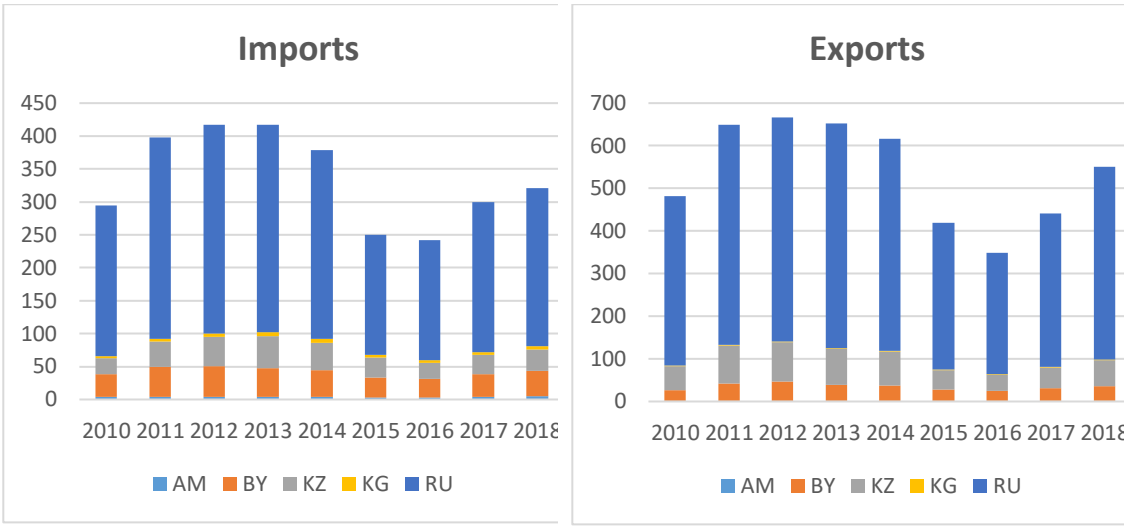
In 2018, Russia accounted for 79.43 per cent of the total volume of merchandise trade among the EAEU member states, Kazakhstan for 10.73 per cent, Belarus for 8.28 per cent, Kyrgyzstan for 0.74 per cent and Armenia for 0.54 per cent. Trade in the EAEU can be characterized as highly concentrated (Table 12, Figure 16).

Table 12: The dynamics of merchandise trade of the EAEU countries (USD billion)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
AM									
Imports	3.73	4.09	4.25	4.24	4.15	3.25	3.21	3.89	4.78
Exports	0.86	1.11	1.28	1.35	1.37	1.31	1.64	2.00	2.17
BY									
Imports	34.88	45.75	46.40	43.02	40.50	30.29	27.60	34.23	38.40
Exports	25.28	41.41	46.05	37.20	36.08	26.66	23.53	29.23	33.72
KZ									
Imports	24.02	38.01	44.53	48.80	41.29	30.56	25.17	29.34	32.53
Exports	57.24	88.10	92.28	84.69	79.45	45.95	36.77	48.34	60.95
KG									
Imports	3.22	4.26	5.37	5.98	5.68	4.06	3.84	4.48	4.82
Exports	1.29	1.83	1.43	1.54	1.69	1.44	1.42	1.75	1.69
RU									
Imports	228.91	306.09	316.19	314.94	286.64	182.12	182.25	227.58	240.22
Exports	397.06	516.99	524.76	527.26	497.83	343.90	285.49	359.15	451.49
EAEU									
Imports	294.76	398.20	416.74	416.98	378.26	250.28	242.07	299.52	320.75
Exports	481.73	649.44	665.80	652.04	616.42	419.26	348.85	440.47	550.02

Source: UN Comtrade Database, author's calculations

Figure 16: The dynamics of merchandise trade of the EAEU countries (USD billion)



Source: UN Comtrade Database, author's calculations

When we shift our scope of analysis to industrial competitiveness, we have to change our focus from economic performance and international trade flows to industrial performance and manufacturing trade.

Manufacturing export is an important economic driver for many industrialized countries. The experience of the leading industrial economies in the world shows that without effective development of manufacturing exports, countries cannot be fully integrated into the global economic space and perform effectively. Taking industrial competitiveness into account, we should bear in mind that to maintain competitiveness, countries should first and foremost develop exports from medium high- and high-tech industries.

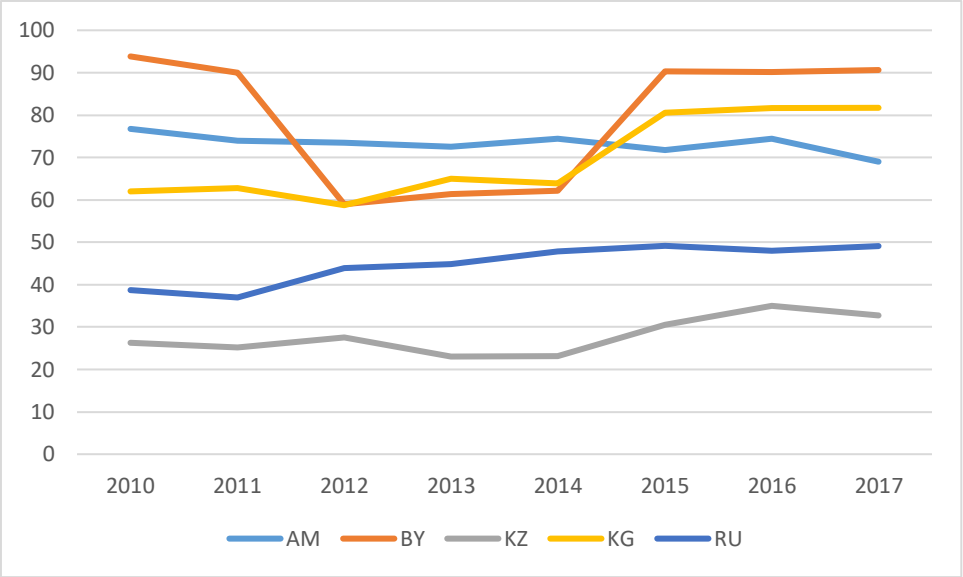
The Treaty on the Eurasian Economic Union, which entered into force in 2015, provides for the possibility to apply joint measures to develop the export of goods from EAEU member states to foreign markets, i.e. insurance and export credit, international leasing, promotion of the concept of "goods of the Eurasian Economic Union" and the introduction of a single market of Union goods, exhibition and trade fair activities, advertising and image-building events abroad (Treaty of the EEU, 2014). The focus on exports stems from the recognition of the crucial importance of this activity for the EAEU countries' development and economic growth.

A relative indicator of the dynamics of exports is the propensity to export. It is measured as the percentage of goods and services allocated for export in the total volume of produced goods. In the EAEU countries, the propensity to export is relatively high. In Belarus, the maximum values reached between 70 per cent and 80 per cent, between 50 per cent and 60 per cent in Kazakhstan

and Kyrgyzstan, , and between 30 per cent and 40 per cent in Russia and Armenia. In all the five countries, however, the intensity of exports is unstable due to the impact of external shocks, primarily falling export prices and changes in exchange rates. The vulnerability of the EAEU countries to external shocks is caused by the high level of export concentration, the predominance of raw materials (mineral raw materials and agricultural products) in the commodity structure of exports and dependence on the world markets of raw materials, characterized by instability (Gurova, 2016).

The competitiveness in the world markets of products produced in the EAEU has increased, as evidenced by the growth in exports of the products of most manufacturing industries. The volume of manufacturing export in the EAEU countries increased by 13.7 per cent compared to 2010 and reached USD 221.3 billion in 2017. Russia accounted for the largest share (79.61 per cent), followed by Belarus (11.98 per cent), Kazakhstan (7.14 per cent), Armenia (0.62 per cent) and Kyrgyzstan (0.65 per cent. In the period 2010–2017, the share of manufacturing exports in the EAEU's total exports varied significantly from 32.7 per cent in Kazakhstan to 90.7 per cent in Belarus. Special attention should be paid to a significant drop in the share of manufacturing exports in the total exports of Belarus in the period 2012–2014 amid a decline in industrial production (Figure 17).

Figure 17: Share of manufacturing exports in total exports of EAEU countries (%)



Source: UN Comtrade Database, author's calculations

Manufacturing exports per capita (MX p.c.) is an additional indicator reflecting the ability to realize a comparative advantage in specific industries. It allows country comparisons, irrespective of country size. It is calculated as:

$$\text{ME p.c.} = \frac{Total\ ME}{Population} \quad (8)$$

The value of exports per capita has an obvious advantage for cross-country comparisons because the absolute value of exports may depend on the economy's overall size and not necessarily on its performance.

Table 13: Trends in the development of ME per capita growth in EAEU countries (USD)

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
AM	209	248	293	327	332	316	413	519
BY	2367	3770	4246	3283	3237	2375	2079	2641
KZ	792	1218	1283	1000	990	633	568	724
KG	61	87	100	93	93	85	85	138
RU	983	1261	1474	1524	1563	1088	876	1562
EAEU	1093	1421	1597	1571	1561	1163	961	1225

Source: UNCTADstat Data Portal, author's calculations

According to data in Table13, Belarus is the leader within the Union with an ME p.c. value of USD 2,641 (+11.6 per cent compared to 2010). In this indicator, it outperforms the other two countries of the "manufacturing triad" – Russia and Kazakhstan at USD 1,562 (+58.9 per cent compared to 2010) and USD 724 (-8.6 per cent) in 2017.An upward overall tendency in this indicator was evident in the EAEU in the period 2010–2017, with Kazakhstan being the only exception, where ME p.c. in 2017 was lower than in 2010 (USD -68). This reflects the economy's ongoing transformation as a result of the extensive de-industrialization process.

The dynamics and structure of manufacturing exports are presented in Appendix 4. If we take a look at the manufacturing export structure, we find that it is dominated by labour-intensive as well as resource-intensive industries. In Kazakhstan and Kyrgyzstan, basic metals account for half of manufacturing exports (58.2 per cent and 55.2 per cent, respectively). The share of basic metals in total exports is lower in Armenia (30.3 per cent), followed by such labour-intensive industries as food and beverages (23.5 per cent) and tobacco products (17.2 per cent). Resource- and capital-intensive industries dominate the structure of manufacturing exports in Belarus and Russia. Coke and refined petroleum products, for example, account for the largest share in their exports (35.1 per cent and 21.6 per cent, respectively), followed by basic metals (23.7 per cent in

Russia), chemicals and chemical products (16.7 per cent in Belarus) and machinery and equipment (10.5 per cent in Belarus).

A joint analysis of the export production structure of a country's manufacturing sector at the level of industries allows for an assessment of how the manufacturing sector progressed during the study period to influence MVA and generate a higher potential, promoting the expansion of a competitive supply of products on foreign markets and highlighting the key clusters of advanced development. The corresponding calculated values are provided in Table 2.2 of Appendix 2 and Table 4.2 of Appendix 4, and are illustrated for the countries in Figure18.

Among the industries with a high value added in the EAEU in 2017, metals were predominantly being exported by Kazakhstan, Kyrgyzstan, Armenia and Russia. The main exporters of chemical and petrochemical products were Russia, Belarus and Kazakhstan. At the same time, Russia and Belarus were the biggest exporters of machinery and equipment within the EAEU. Food products were exported by all five countries of the Union, with the largest share being dairy products (Belarus), fish (Russia), spirits (Armenia), fruit and vegetables (Kyrgyzstan) and tobacco (Armenia).

The share of manufactured products in the countries' total exports was relatively high, with the majority of products being at intermediate stages without expanding the MVA. A notable amount of exports of textile products as well as cars, trailers and semitrailers was recorded from Kyrgyzstan.

Although external demand for their products was not yet particularly high in the period analysed, the industries in the countries of the Union should be differentiated to determine whether their exports represent the country's specialization in the international division of labour. These are sectoral clusters that are common for virtually all countries in the region, with different technological profiles and the most intensive promotion of products to other countries, in particular the production of office, accounting and computing machinery; electrical machinery and apparatus; non-metallic mineral products; wood products; furniture; leather, leather products and footwear.

A strong manufacturing industry used to reflect the country's technological strength, and its contraction was a sign of economic decline. Just as the indicators of sectoral shifts on the production side should be monitored, it is also important to monitor structural changes on the export side. This represents the country's relative competitive strength in one sector over others.

Figure 18: Distribution of manufacturing industries according to their share in MVA and exports by EAEU countries (%)

Source: Author's calculations

Appendix 4.3 presents the estimated patterns of relative structural change in the manufacturing exports of EAEU countries. According to the data, the most obvious structural change during the period 2010–2017 occurred in Armenia in exports from low-tech industries: tobacco products (160.5 per cent), wearing apparel, fur (101.3 per cent) and textiles (29.9 per cent). In the 2016–2017 period, structural change occurred in exports from medium high- and high-tech industries due to the increase in electrical machinery and apparatus (42.1 per cent). Such high figures reflect an expansion in the volume of exports from labour-intensive industries in total manufacturing exports, and highlight the country's export specialization.

Belarus experienced structural change in exports from all tech groups during the period 2010–2017, with the most evident change visible in low-tech industries: wood products, excluding furniture (3.9 per cent) and recycling (1.1 per cent), followed by capital-intensive medium low-tech non-metallic mineral products (1.2 per cent in 2010–2017 and 0.2 per cent in 2016–2017). Like Armenia, Belarus experienced structural change in exports from medium high- and high-tech industries due to the increase in other transport equipment (0.2 per cent). In general, Belarus focussed on exports from medium low-, medium high- and high-tech industries, and no serious structural changes in the exports from these industries occurred within the period analysed.

In Kazakhstan, which specializes in exports from medium low-tech industries, structural change in the exports from low- and medium high-and high-tech industries were evident. Over the period 2010–2017, the most obvious structural changes occurred in the following labour-intensive industries: textiles (7.3 per cent), tobacco products (2.4 per cent), printing and publishing (2.7 per cent), along with structural changes in such capital-intensive industries as electrical machinery and apparatus (4.2 per cent) and radio, television and communication equipment (1.1 per cent). For the 2016–2017 period, the most evident structural change was observed in exports from low-tech industries: wood products (2 per cent) and textiles (1.7 per cent).

Another EAEU economy that specializes in exports from medium low-tech industries, Kyrgyzstan, experienced the most obvious structural change in exports from low- and medium high- and high-tech industries from 2010 to 2017: radio, television and communication equipment (364.2 per cent), leather, leather products and footwear (103.2 per cent), medical, precision and optical instruments (124.6 per cent), electrical machinery and apparatus (35.8 per cent) and tobacco products (15.3 per cent). During the 2016–2017 period, structural change occurred in exports from low-tech industries due to the increase in wood products (5.1 per cent) as well as leather, leather products and footwear (1.8 per cent). Such high figures highlight the increasing sophistication of the export structure towards medium high- and high-tech products.

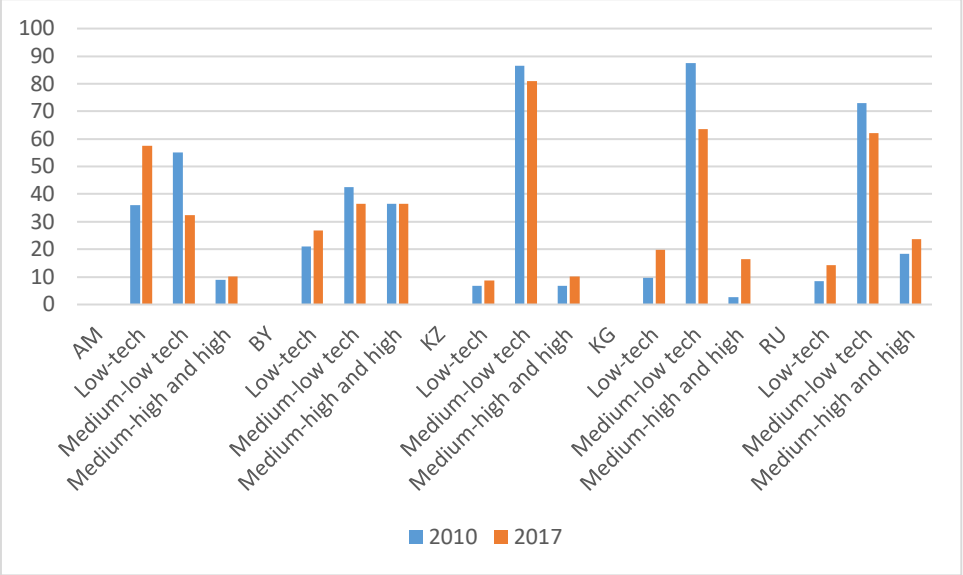
Finally, Russia, as well as Belarus experienced structural change in the exports from all three tech groups in the period 2010–2017, with the most evident change occurring in low-tech industries: wearing apparel, fur (6.5 per cent), food and beverages (1.2 per cent), followed by capital-intensive medium low-, medium high- and high-tech industries, such as: motor vehicles, trailers, semi-trailers (1.9 per cent), office, accounting and computing machinery (1.7 per cent), fabricated metal products (1.2 per cent) and non-metallic mineral products (1.1 per cent). From 2016–2017, manufacturing exports did not experience any serious structural change, except exports from medium high- and high-tech industries due to the increase in other transport equipment (0.4 per cent). In general, we can conclude that within the period analysed, Russia had the most sustainable structure of manufacturing export. Compared to other large, resource-rich countries, where export capacity is typically less important due to the size of the domestic market, it plays quite a noteworthy role for Russia's manufacturing sector.

It should be mentioned that countries whose export baskets have a significant share of products of high technological sophistication tend to show higher rates of economic growth in the long run. By contrast, if a country's productive structure and pattern of specialization is dominated by labour-intensive and natural resource-based goods, countries tend to experience a falling behind path (UNCTAD, 2013).

Appendix 4.5 presents the distribution of activities according to the technological structure of the manufacturing sector's exports from EAEU countries. The technological structure of manufacturing exports is characterized by the share of medium- and high-tech exports in the total value of manufacturing exports.

The share of exports of medium high- and high-tech products in the EAEU's total volume of exports accounted for 19.5 per cent, that of medium low-tech products was 55.1 per cent, while the share of exports from low-tech industries amounted to 25.4 per cent in 2017. At the same time, the share of exports from medium high- and high-tech industries increased since 2010 (+4.8 per cent), as did the share of exports from low-tech industries (+9 per cent) at the expense of those from medium-low tech industries (-13.8 per cent).

Figure 19: Technological structure of the manufacturing exports from EAEU countries (%)



Source: UN Comtrade Database, author's calculations

According to data in Figure 19, exports from medium low-tech industries dominated the technological structure of the EAEU's manufacturing exports in 2017, mostly due to basic metals exports. At the same time, the role of this tech group declined slightly throughout the EAEU compared with 2010. Moreover, Armenia was the only country in the Union in which exports from low-tech industries dominated the country's manufacturing exports. Within the period analysed, the share of exports from medium low-tech industries in Armenia has been continuously decreasing amid rising exports from low-tech industries, primarily food and beverages. Finally, exports from medium high- and high-tech industries grew in all EAEU countries between 2010 and 2017, due to the contribution of chemicals and chemical products, and machinery and equipment.

Appendix 4.4 presents the findings on export concentration and diversification indices. It is known that there is a strong relationship between domestic production and international trade, which allows us to measure overall economic performance and growth by measuring export diversification. The Herfindahl-Hirschman Index is usually used for this purpose.

The indices of the concentration and diversification of exports are used as indicators of the country's participation in international trade. The export concentration index displays how wide the range of goods is that a given country exports. At the same time, the export diversification index reveals the deviation of the commodity structure of a country's exports from the structure of world exports.

According to our research results, the diversification of the structure of manufacturing exports is highest in Belarus, where C_d is mostly close to 1. That is, it is less subjected to changes in external market conditions, price fluctuations and competition from third countries. At the same time, the manufacturing export structure of Armenia and Russia has improved significantly since 2010. The structure of manufacturing exports is mostly concentrated in Kazakhstan and Kyrgyzstan, with a predominance of several industries. It is worth mentioning that the exports of Kazakhstan's manufacturing industries are the least diversified in the EAEU, with $C_d = 0.6$, a share that has remained unchanged since 2010. At the same time, compared with 2010, Kyrgyzstan managed to substantially diversify the structure of its manufacturing exports (Table 14).

Table 14: Diversification of manufacturing exports in EAEU countries

	2010	2011	2012	2013	2014	2015	2016	2017
AM	0.68	0.69	0.75	0.77	0.78	0.80	0.82	0.81
BY	0.85	0.81	0.84	0.88	0.88	0.84	0.88	0.88
KZ	0.61	0.59	0.63	0.68	0.71	0.67	0.68	0.61
KG	0.27	0.21	0.51	0.43	…	0.64	0.60	0.68
RU	0.70	0.69	0.72	0.72	0.70	0.76	0.80	0.80

Source: Author's calculations

It is important to note that in terms of resource-based export specialization dominance in the EAEU countries, the potential of exports from a number of manufacturing industries, especially high-tech industries, has not yet been exposed. The fundamental limitation is the prevailing low competitiveness of high-tech manufacturing industries and the resulting weak integration of the EAEU's industrial production into global markets.

6. Competitiveness of industrial performance of the EAEU countries

To develop a coordinated industrial policy, the peculiarities of the EAEU countries' industrial competitiveness must be taken into account, based on international ratings. UNIDO publishes an annual competitive industrial performance report, in which countries are ranked according to the Competitive Industrial Performance index (CIP index), which consolidates eight indicators related to the production and trade of manufactured goods, technological intensity and the country's impact on the world market. It assesses and benchmarks industrial competitiveness across economies, providing valuable information on the strengths and weaknesses of national manufacturing sectors. Economies are grouped into quintiles of the CIP index – top, upper middle, lower middle and bottom, according to their composite score.

The CIP index ranges between 0 and 1. Yet the highest score (achieved by Germany) is only 0.52. This reflects the fact that no country leads in all eight CIP indicators. At the same time, the CIP scores are distributed very unequally. Few countries achieve high scores and thus do not substantially outrival others in terms of industrial competitiveness; low CIP scores below 0.1 are far more frequent. Germany is followed by Japan (0.40), China (0.37), the Republic of Korea (0.36) and the United States (0.36).

Manufactured goods represent around 75 per cent of total merchandise trade (UNCTAD, 2018), with the other 25 per cent composed of primary products or commodities. Malik and Temple (2009) assert that manufactured goods are less likely than commodities to be affected by price fluctuations, and as a result of their higher value added, often yield more benefits for those that produce them (Malik and Temple, 2009). Based on this notion, an increase in industrial competitiveness implies that the country is exporting manufactured goods—as opposed to commodities—and consequently, has a wider margin of benefits, which in turn has a higher impact on the country's overall economic performance and prosperity (UNIDO, 2019).

There is a strong link between industrial competitiveness and the SDGs. Greater industrial competitiveness raises an economy's likelihood of succeeding in achieving the SDG targets, particularly SDG 9 to "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation".

The 2018 CIP index assesses and benchmarks the industrial competitiveness of 150 countries. It provides an indication of whether a country's manufacturing sector contributes to its development. Each country's outcome is a reflection of its performance across the three dimensions of the CIP index: (1) The capacity to produce and export manufactured goods; (2) Technological deepening and upgrading, and (3) World impact. The CIP index allows for an identification of comparators, benchmark performance and its main drivers (Table 15).

Table 15: Composition of the CIP index

First dimension: Capacity to produce and export manufactured goods
Indicator 1: Manufacturing value added per capita
Indicator 2: Manufacturing exports per capita
Second dimension: Technological deepening and upgrading
Composite indicator (3 and 4): Industrialization intensity
Composite indicator (5 and 6): Export quality
Third dimension: World impact
Indicator 7: Impact of a country on world manufacturing value added
Indicator 8: Impact of a country on world manufacturing exports

Source: UNIDO, 2013

The CIP index is particularly useful for developed countries, especially those aiming to return their industries back from other countries. It is also practical for developing countries, especially primary producers who suffer from "Dutch disease", such as Russia. This means that the strengthening of the national currency, caused by an increase in the exports of raw materials, leads to a decrease in industrial production and economic efficiency as a whole. The "Dutch disease" also increases the national economy's dependence and that of the national currency's exchange rate on the situation of raw material exports on the world market, and this, in case of a long period of low prices, can cause a systemic economic crisis, such as a crisis of Russia's economy in 1998.

UNIDO's ranking allocates higher scores to countries with more advanced processing, implying that their long-term growth is more sustainable. The decline in the share of the manufacturing sector in the economy leads to a slowdown in the country's economic growth in the long term, as the manufacturing industry is a key source of innovation in the economy, and reduces volatility due to external and internal fluctuations. This conclusion contradicts David Ricardo's competitive advantage theory, however, it is confirmed empirically and is supported by the new theories of international trade (Paul Krugman, Marc Melitz, etc.).

Table 16: Competitive industrial performance indices of EAEU countries

	AM		BY		KZ		KG		RU	
	2010	**2017**	**2010**	**2017**	**2010**	**2017**	**2010**	**2017**	**2010**	**2017**
CIP rank	109	99	42	46	64	66	124	118	33	31
CIP score	0.01	0.01	0.08	0.07	0.05	0.04	0.00	0.01	0.12	0.11
CIP quintile	Lower Middle		Upper Middle		Middle		Bottom	Lower Middle	Upper Middle	
Per capita indicators										
Manufactured exports p.c.	208.76	519.22	2366.81	2641.44	792.36	723.97	61.01	138.42	983.3	1116.74
MVA p.c.	315.26	435.31	1359.98	1468.09	1022.07	1098.54	149.08	147.39	1362.17	1561.45
World share indicators										
Impact of a country on world manufactures trade	0.00		0.00		0.00		0.00		0.01	
Impact of a country on world MVA	0.00		0.00		0.00		0.00		0.02	
Share of medium- and high-tech activities										
Medium- and high-tech manufactured exports share in total manufactured exports	0.25	0.13	0.39	0.40	0.37	0.36	0.20	0.29	0.24	0.29

Medium- and high-tech MVA share in total MVA	0.05	0.05	0.40	0.39	0.13	0.13	0.03	0.03	0.25	0.30
Share of national aggregates										
Manufactured exports share in total exports	0.69	0.76	0.89	0.86	0.23	0.27	0.26	0.48	0.35	0.45
MVA share in total GDP	0.09	0.10	0.23	0.23	0.11	0.10	0.17	0.14	0.13	0.14
Manufacturing export indices										
Manufactured exports p.c. index	0.01	0.02	0.07	0.08	0.02	0.02	0.00	0.00	0.03	0.03
Share of manufactured exports in total exports index	0.71	0.78	0.91	0.88	0.23	0.28	0.26	0.49	0.36	0.46
Share in world manufacturing exports index	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.09	0.07
Share of medium- and high-tech activities in manufacturing export index	0.30	0.14	0.47	0.41	0.45	0.38	0.24	0.30	0.29	0.30
Industrial export quality index	0.50	0.46	0.69	0.65	0.34	0.33	0.25	0.39	0.32	0.38

MVA indices										
MVA p.c. index	0.02	0.02	0.10	0.06	0.07	0.04	0.01	0.01	0.10	0.06
Share of world MVA index	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.10	0.07
Share of MVA in GDP index	0.27	0.28	0.69	0.67	0.34	0.29	0.51	0.39	0.38	0.39
Share of medium- and high-tech activities in total MVA index	0.05	0.06	0.47	0.50	0.15	0.17	0.04	0.03	0.29	0.38
Industrialization intensity index	0.16	0.17	0.58	0.58	0.24	0.23	0.27	0.21	0.34	0.39

Source: UNCTADstat Data Portal

According to data in Table 16, Russia led the industrial competitiveness list among the EAEU countries. Russia's CIP rank has improved by two positions since 2010, but at the same time, its CIP score decreased from 0.12 to 0.11. Russia is the only country in the EAEU that has an impact on world MVA and manufactures trade at the level of 1.7 and 1.3 per cent, respectively.

Meanwhile, the other two countries of the "manufacturing triad", Belarus and Kazakhstan, witnessed a decline of their industrial competitiveness within the period analysed – by four and two positions, respectively. Their CIP scores decreased from 0.08 to 0.07 for Belarus and from 0.05 to 0.04 for Kazakhstan.

Armenia and Kyrgyzstan rank in the lower middle quintile of the CIP index. Armenia made some major strides in its industrial competitiveness during the period analysed, namely by ten positions. Kyrgyzstan's CIP rank has also improved by six positions since 2010, with an absolute increase in its CIP score of less than 0.001. The country also managed to move from the bottom quintile of the ranking to the lower middle quintile. Such countries are likely to replicate technologies in a bid to "catch up" with innovative countries at the frontier, as they lack the capabilities to act as pioneers themselves.

If we take a look at the first CIP dimension indicators 'capacity to produce' and 'export manufactured goods', we can conclude that between 2010 and 2017, only two countries, namely Armenia and Belarus, managed to improve their performance in one of the indicators (manufactured exports per capita), while figures in the rest of the EAEU countries remained the same. Besides, there was a notable drop in MVA per capita in Belarus, Kazakhstan and Russia – the "manufacturing triad" of the Union. We can thus conclude that the volume of manufacturing production and exports indicates that there is room for improvement for the EAEU's industrialization process. In a globalized economy, a country's capacity for production must be accompanied by an ability to export manufactured goods. Manufacturing industries that are unable to specialize and integrate in global value chains are unlikely to be competitive and will face limitations in terms of demand for their products, which is in direct relation to the size of their economies (UNIDO, 2019).

At the same time, the EAEU countries were unable to increase their average competitiveness in the second dimension—technological deepening and upgrading—between 2010 and 2017.There was a decrease in industrial export quality practically everywhere in the EAEU, except in Russia and Kyrgyzstan, where the share of medium- and high-tech activities rose significantly within the period analysed. Such a decline in export quality indicates that manufacturing goods from Armenia, Belarus and Kazakhstan became less competitive on the international market, which is a bad sign amid the intensification of competition on the global markets.

The position of some of the countries of the Union even fell in the industrialization intensity ranking (Kazakhstan, Kyrgyzstan) due to a decrease in MVA share in GDP. Industrialization intensity is an important indicator as it serves to estimate the complexity of production processes. The only country within the EAEU that managed to markedly raise its industrialization intensity in the period 2010–2017 was Russia due to an increase in the share of medium- and high-tech activities in total MVA.

Finally, rankings in the third dimension of the CIP index, world impact, are highly correlated with a country's level of industrialization as well as the size of its economy. During the period analysed, these indicators remained unchanged in the EAEU countries. In 2017, the five EAEU countries were responsible for only 1.99 per cent of global MVA and 1.66 per cent of global trade in manufactured goods, mainly due to the contribution of Russia. The higher the value of these shares, the higher the country's ability to benefit from agglomeration, scope and scale effects.

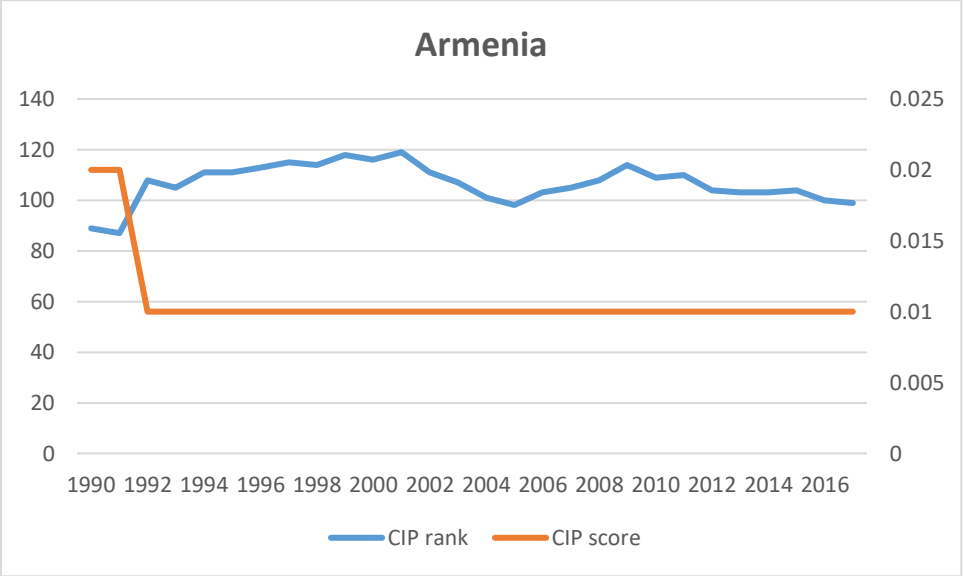
If we take a closer look at the different dimensions of competitiveness within the EAEU, we find that this group of countries with different stages of industrial development faces major challenges in all three dimensions: producing and exporting manufactured goods, upgrading and technological deepening, and the challenges they face on international markets is even bigger, as they have almost no impact.

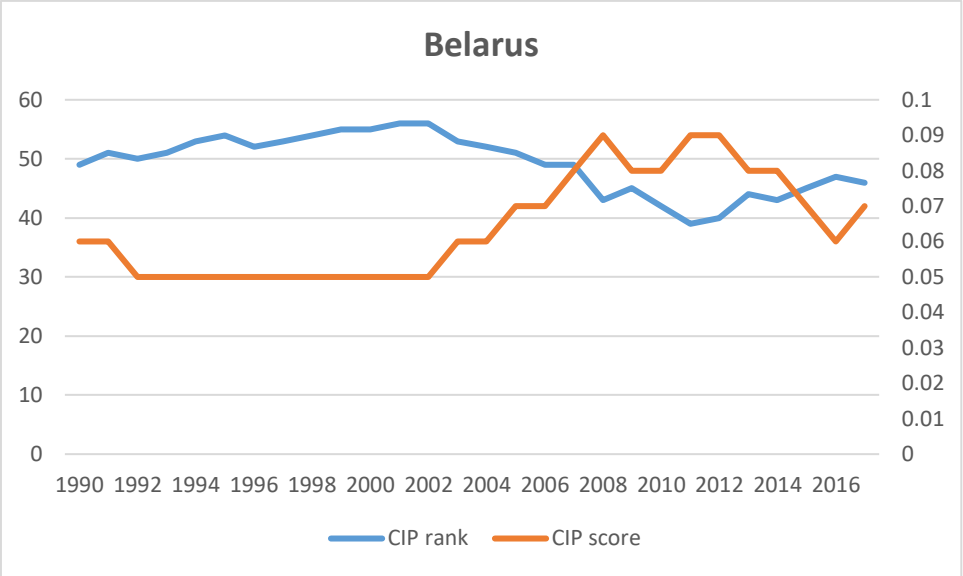
UNIDO's CIP database begins from the 1990s onwards. If we take all years together, we find that the level of industrial development has deteriorated in all countries of the Union, except in Belarus. As a result of the collapse of the USSR, there was a sharp decline in the industrial competitiveness of the EAEU member states, especially in Russia, which moved from the top CIP quintile group to the upper middle quintile in 1994. For example, in 1990, Russia's CIP rank was 24 and its CIP score was 0.13. At that time, the country had a greater impact on world MVA than it does today (4 per cent).

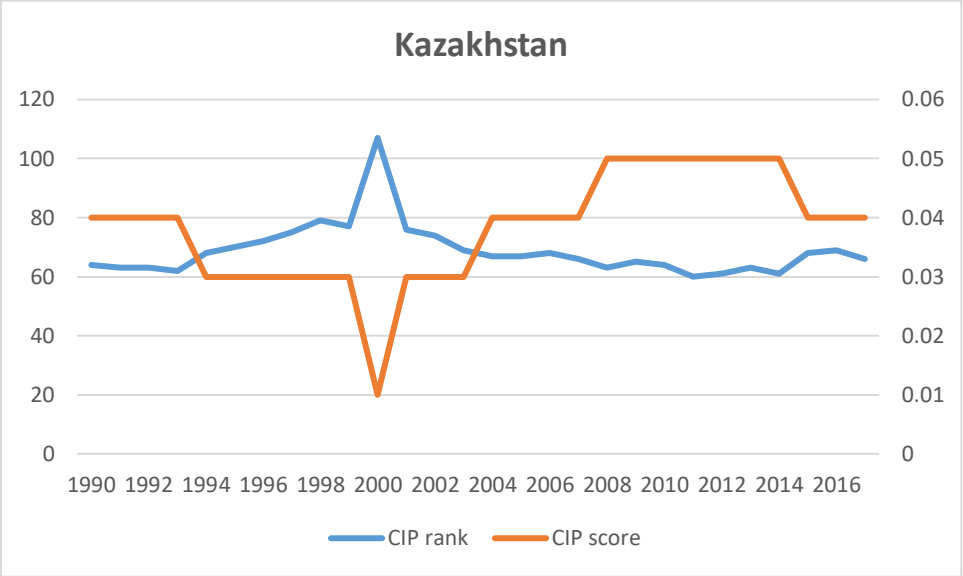
In 1990, Australia and Israel were Russia's main competitors in the CIP ranking, followed by such countries as Portugal, Brazil and Luxembourg with CIP scores of 0.12. Russia still finds itself behind Israel and Australia, which represent the top quantile group, but all three countries' industrial performance has deteriorated with indicators dropping to less than 0.13. According to the ranking results, Belarus is lagging behind Luxembourg and South Africa, followed by New Zealand and Estonia. Kazakhstan's main rivals from the middle group are Malta, Costa Rica, Ukraine and Oman. The other two EAEU countries, Armenia and Kyrgyzstan, represent the lower middle group. While Armenia follows Paraguay and ranks higher than Bolivia, Kyrgyzstan's main rivals in industrial performance are Cameroon and the Bahamas. In general, the industrial competitiveness of the majority of countries mentioned above has declined since 1990, due to the transition to new models of economic development focussing on boosting other sectors.

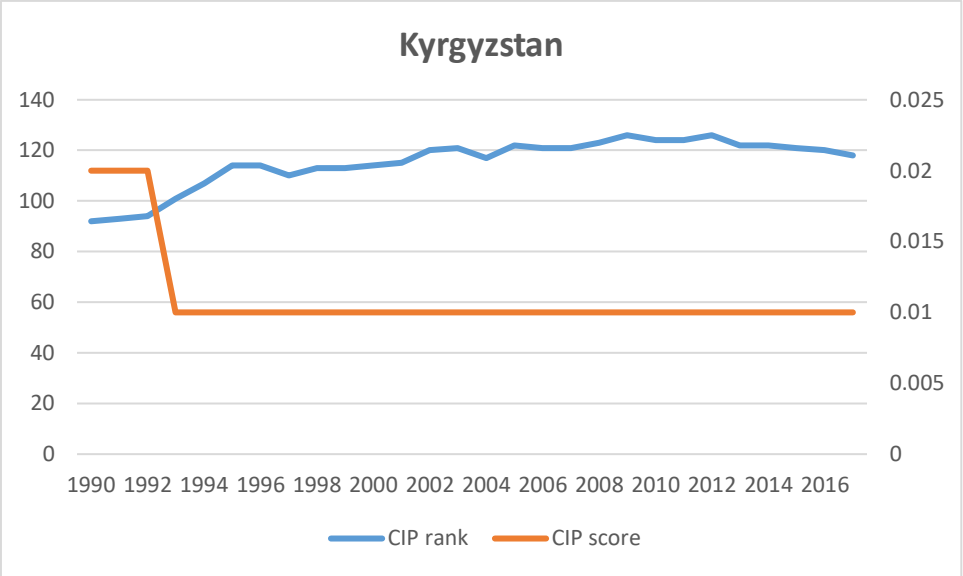
Figure 20 presents the change in rank and score of the EAEU countries over the period 1990–2017. Figure 21 illustrates the normalized results of the six indicators of the CIP scores for the EAEU countries in 2010 and 2017.

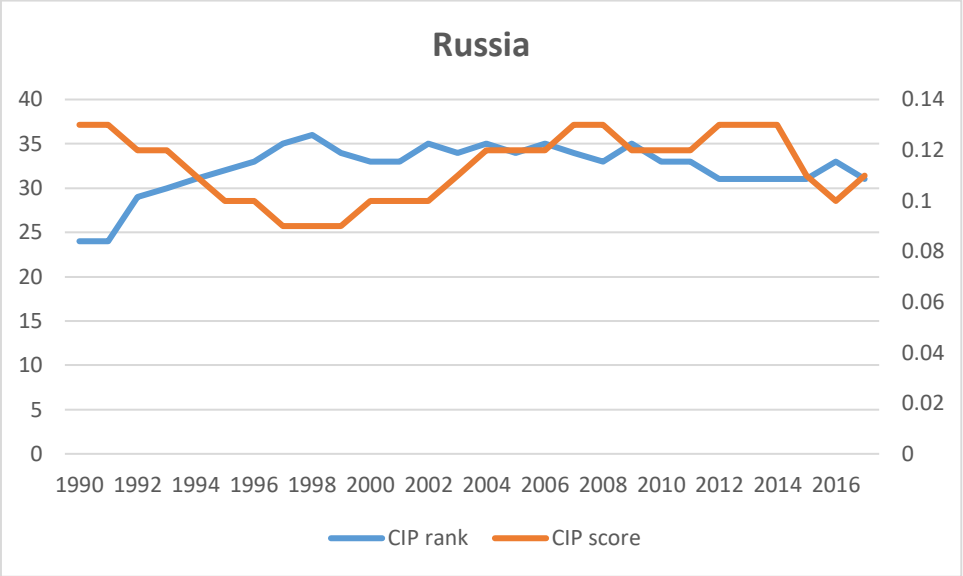
Figure 20: The EAEU CIP ranks and scores, 1990–2017




Belarus
60
50
40
30
20
10
0
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
CIP rank
CIP score


Kazakhstan
120
100
80
60
40
20
0
0.06
0.05
0.04
0.03
0.02
0.01
0
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
CIP rank
CIP score



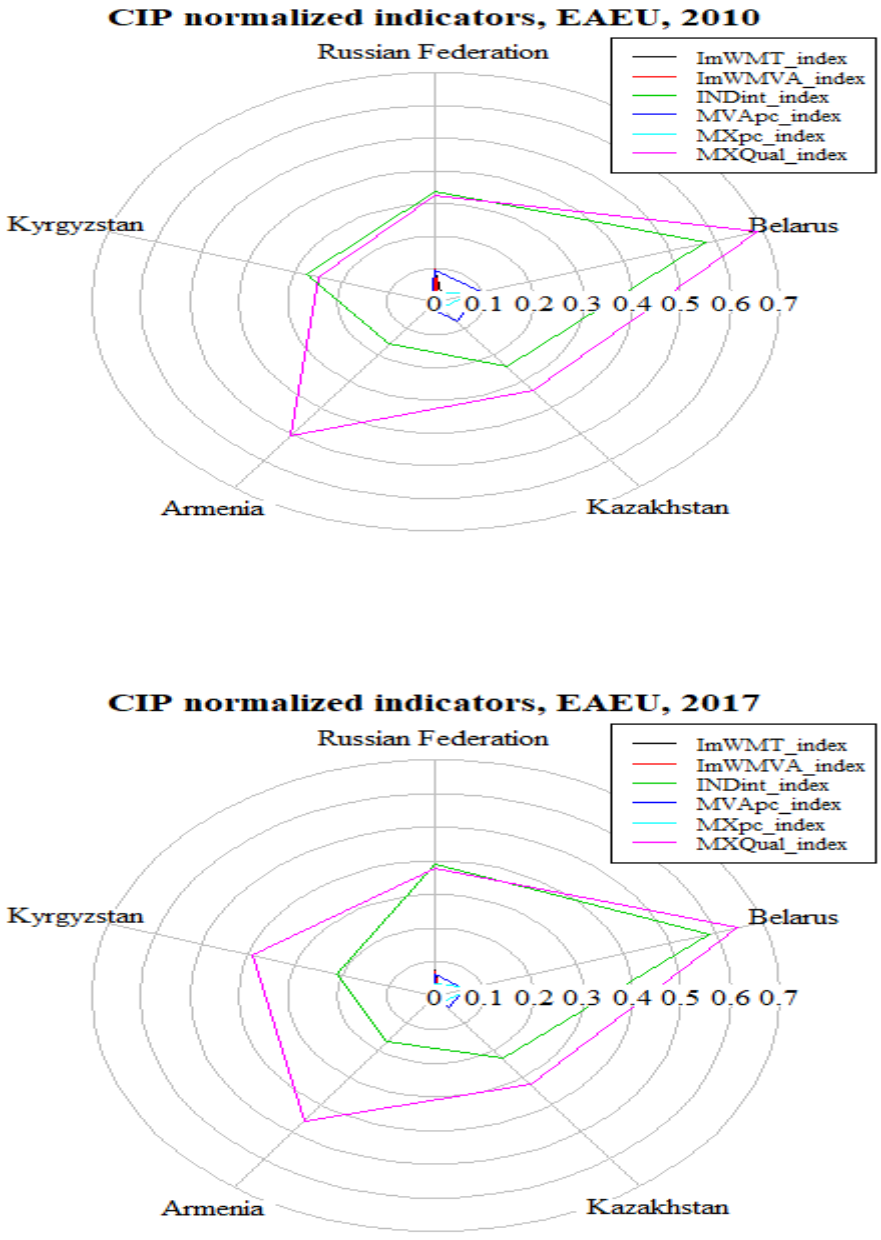


Source: UNCTADstat Data Portal, author's calculations

The analysis of UNIDO's CIP index reveals multidirectional trends in the industrial competitiveness of the EAEU countries. After a long systemic crisis associated with the collapse of the USSR and the transition from a planned to a market economy, only Belarus managed to improve its position in the ranking during the period analysed. Despite the fact that Russia's position has decreased, it still lies ahead of other EAEU countries. Kyrgyzstan faces the most difficult situation: as a result of the continuing deterioration of indicators in industry, the country has a low level of competitiveness. It is important to note that the manufacturing sectors of countries that perform poorly in the CIP index are characterized by inefficiencies in the allocation of factors of production, such as labour and capital.

The CIP index helps us trace the competitive strengths and weaknesses of countries' industrial performance. Figures show that the common strengths of the EAEU's industrial competitiveness are manufactured export quality and industrialization intensity, i.e. the second dimension indicators, representing technological deepening and upgrading. At the same time, the other indicators expose the weaknesses of all EAEU countries' industrial competitiveness.

Figure 21: CIP indicator scores of the EAEU, 2010 and 2017



Source: UNCTADstat Data Portal, author's calculations

A radar-type chart is used in Figure 21 to present the EAEU countries' comparative performance according to the CIP ranking. Despite being a top industrial performer in the EAEU, Russia ranks second after Belarus, both in industrial export quality as well as in industrialization intensity. These are the only two indicators of industrial competitiveness the EAEU countries are successful in. That is, despite relatively good results in this indicator, all EAEU countries need to improve their performance in other indicators, especially world shares.

Nevertheless, the results reveal that the largest contributor to Russia's CIP score during the period analysed was the increase in the global impact of manufactures trade. In 2017, Russia accounted for 1.3 per cent of global trade in manufactured goods (up from 0.8 per cent in 1990). Moreover, there was a steady growth in the volume of manufactured exports per capita, amounting to USD 1,116 in 2017 compared with USD 237 in 1990 and USD 983 in 2010. The only country that managed to improve its performance in the CIP ranking, Belarus, demonstrated particularly good results in the per capita indicators. In 2017, MVA per capita and manufactured exports per capita amounted to USD 1,468 and USD 2,641 compared to USD 476 and USD 660 in 1990, and USD 1,360 and USD 2,366 in 2010. Kazakhstan improved its performance in MVAper capita, amounting to USD 1,099 in 2017 (USD 1,022 in 2010) whereas its manufactured exports per capita declined from USD 792 in 2010 to USD 723 in 2017. Like Armenia and Kyrgyzstan, Kazakhstan displayed weak results in industrialization intensity. That is, despite some minor success in the CIP rank between 2010 and 2017, EAEU countries' overall performance is fairly poor and there is still considerable room for improvement in inclusive and sustainable industrialization.

7. Greening of the manufacturing industry in the EAEU

More than 30 years have passed since the introduction of the concept of sustainable development in 1987, which raised the most important question of our times: whether man and the natural environment can coexist. The concept of sustainable development is the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations General Assembly, 1987, p. 43). Albeit somewhat vague, this concept of sustainable development aims to maintain economic advancement and progress while protecting the long-term value of the environment; it "provides a framework for the integration of environment policies and development strategies" (United Nations General Assembly, 1987).

At the forefront of the next industrial revolution, industrial companies face the difficult task of reindustrialization, taking into account the adaptation to new conditions and business opportunities. One of the new requirements for industrial development is the modernization of

production through the use of environmentally friendly technologies and strict environmental regulations. In fact, the "green" modernization of industry is becoming an integral part of the industrial revolution.

The concept "green industry" emerged in 1995 and is defined as a business strategy that focusses on making a profit by using environmentally friendly technologies to achieve a competitive advantage (Hart, 1995). UNIDO (2009, 2011) defines green industry as industrial production with no negative impact on natural systems or human health. SDG target 9.4 addresses the environmental sustainability of industrial development, calling for industries to become sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes.

According to Michael Porter and Claas van der Linde's theory, pollution is a sign of inefficient resource use. Win-win opportunities for the environment and economy can be captured through improvements that reduce pollution in production processes (Porter and van der Linde, 1999). Porter and van der Linde argue that competitive advantages hinge on the capacity for innovation; thus, "by stimulating innovation, strict environmental regulations can actually enhance competitiveness" (Porter and van der Linde, 1995, p. 98).

As stated in the Rio Declaration of 1992, countries should follow one common principle: prevent environmental degradation; this principle also acknowledges the different degrees of impact on environmental degradation by developed and developing countries. Developed nations thus bear greater responsibility in light of the resources they require and the pressures they exert on the environment)United Nations Conference on the Human Environment, 1992).

Manufacturing is consistently reducing its emissions as countries move to less energy-intensive industries, cleaner fuels and technologies, and stronger energy efficiency policies have been introduced. The indicator that measures the progress made towards achieving this target is CO_2 emission per unit of value added, i.e. carbon dioxide intensity.

The industrial sector accounted for more than 6,109 million tonnes of CO_2 (or 6.1 Gt CO_2) in 2016, 19 per cent of global emissions. Between 2000 and 2015, global industrial emissions increased by nearly 2.4 Gt CO_2, but intensities overall decreased by 3 per cent in the same period, with a peak in 2011. Due to the shift of manufacturing from industrialized to developing countries, the share of CO_2 emission in industrialized economies is much lower than in developing countries. For example, in 2016, CO_2 emission from industry amounted to 20 per cent in the Americas, 27 per cent in Europe and 49 per cent in Asia (IEA, 2018).

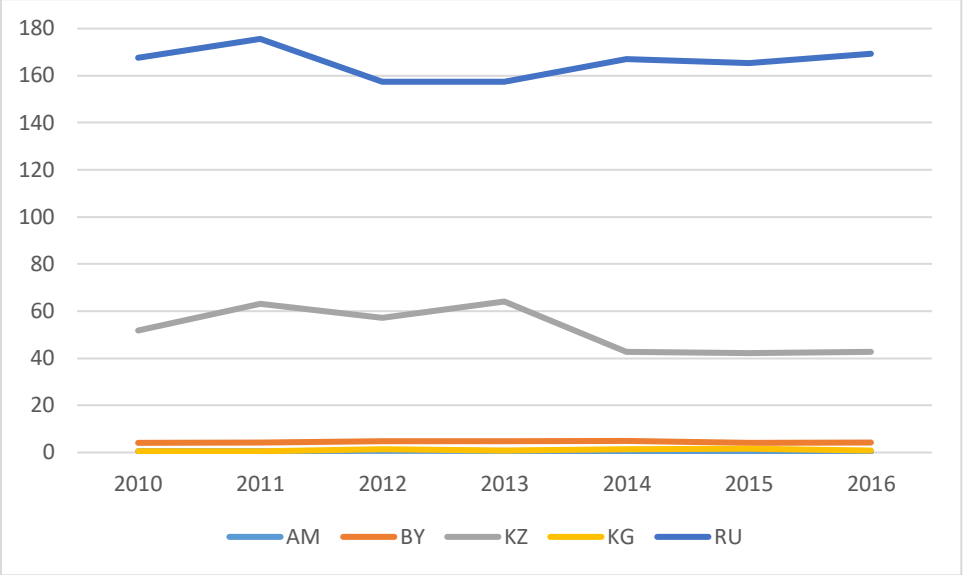
The greening of the economy fully corresponds to one of the key objectives of the EAEU to modernize and improve the competitiveness of national economies in the context of the global economy (Article 4 of the Treaty on the EAEU, 2014), because it implies massive investment, as well as the introduction of modern and efficient technologies. Currently, the economy of all EAEU countries needs modernization. Thus, in Russia, following moderate economic growth in the 2000s, different internal and external factors, including the financial and economic crisis of 2008–2009, the current economic crisis and sanctions by Western countries hampered the country's economic growth (Piskulova and Pak, 2018).

Manufacturing industries are continually reducing their emission levels as countries industrialize. At sub-sector level, a high volume of emissions is commonly observed in the manufacturing of chemicals and chemical products, basic metals and non-metallic mineral products. Structural changes and product diversification in manufacturing can also contribute to the reduction of emissions (UNIDO, 2019).

The Paris Agreement, signed by more than 190 countries in 2016, opened a new phase in world climate policy. The signatory states undertook to prepare and implement national plans to reduce greenhouse gas emission by 2020.

Most of the economies of the former republics of the Soviet Union are characterized by high energy intensity and do not feature low levels of greenhouse gas emission. According to data in Figure 22, Kazakhstan and Russia have the highest CO_2 emission within the EAEU. Belarus is in a much more favourable position, as the share of CO_2 emission is much lower than in the above mentioned countries. In addition, the country has focussed on energy efficiency in the last years. As a result, among the EAEU's "manufacturing triad", Belarus has the highest indicators in greening of manufacturing industry. At first glance, it seems that the countries whose industrial production is lower, namely Armenia and Kyrgyzstan, also have lower levels of emission. The figures illustrate the insufficient level of industrial development rather than any success in energy efficiency in these countries.

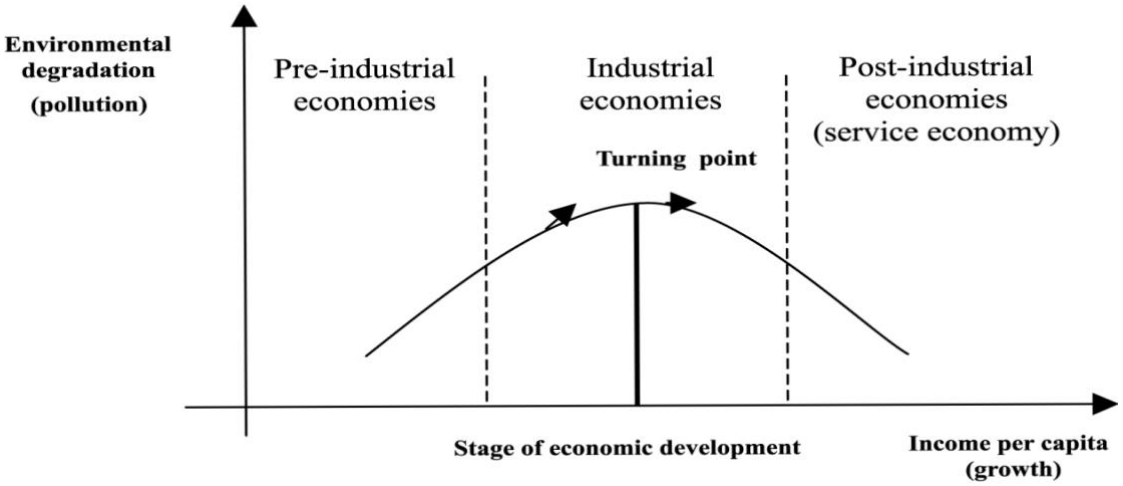
Figure 22: Dynamics of CO_2 emission from manufacturing in the EAEU (million tonnes)



Source: UNCTADstat Data Portal

The human impact on the environment increases with the growth of income and, consequently, material needs rise, leading to the expansion of production activities and intensifying the global environmental crisis. The relationship between the growth of GDP per capita and the level of environmental degradation can be illustrated with a bell (or inverted-U) shape environmental Kuznets curve (EKC). The EKC is named for Simon Kuznets (1955), who hypothesized that income inequality first rises and then falls as economic development proceeds. This curve shows that the growth of GDP per capita leads to an increase in environmental pollution, and eventually to a decrease in connection with the modernization of the economy. When economic growth begins at a low level of development of the country's economy and income, the primary sector (natural resources, mining, agriculture and forestry, etc.) develops first, leading to the depletion of natural resources and environmental pollution (Figure 23).

Figure 23: Environmental Kuznets curve



Source: Panayotou, T. (1993)

Improving the economy's technological structure and its modernization, as well as the welfare of the population and the transition to resource-saving and environmentally friendly technologies, can help reduce the negative impact on the environment. It is difficult to determine the appropriate GDP per capita level to start improving the environmental situation. It depends on the technological and sectoral structure of the economy, the population's level of well-being, and the level and type of environmental pollution. For example, Selden and Song (1994) estimate EKCs for four emission series: SO_2, NO_x, SPM and CO_2 using longitudinal data primarily from developed countries. For the fixed-effects version of their model, these were (converted to USD 1,990 using the US GDP implicit price deflator): SO_2, USD 10,391; NO_x, USD 13,383; SPM, USD 12,275; and CO_2, USD 7,114.

It is important to note that different industries have different pollution intensities. Typically, over the course of economic development, the output mix changes. In the earlier phases of development, there is a shift away from agriculture towards heavy industry, which increases emissions, while in the later stages of development, there is a shift from the more resource intensive extractive and heavy industrial sectors towards services and lighter manufacturing, which supposedly have lower emissions per unit of output. Kander (2002) argues that structural shifts in the economy may largely be an illusion. Due to rising productivity in manufacturing, manufacturing prices fall relative to the prices of services and therefore, manufacturing's share in GDP declines when measured at current prices, but not when measured at constant prices. Due to this productivity growth in manufacturing, its pollution intensity decreases over time relative to the pollution intensity of services.

The Treaty on the EAEU does not have a special section that regulates the environmental relationships between the members, there is only an agreement on cooperation in the field of ecology and environmental protection. It was also decided to establish an Interstate Environmental Council. One of the priorities of the environmental relationship of the states of the Eurasian Economic Union is the development of regulations that allow unification and harmonization of environmental legislation. The legal regime of the EAEU countries' economic activity should take the members' environmental interests into account. On the one hand, the EAEU countries' natural resource sectors account for a significant share of their economies. On the other hand, the most important natural resources are those shared by the states of the Eurasian region, and their exploitation by one country can cause damage to another.

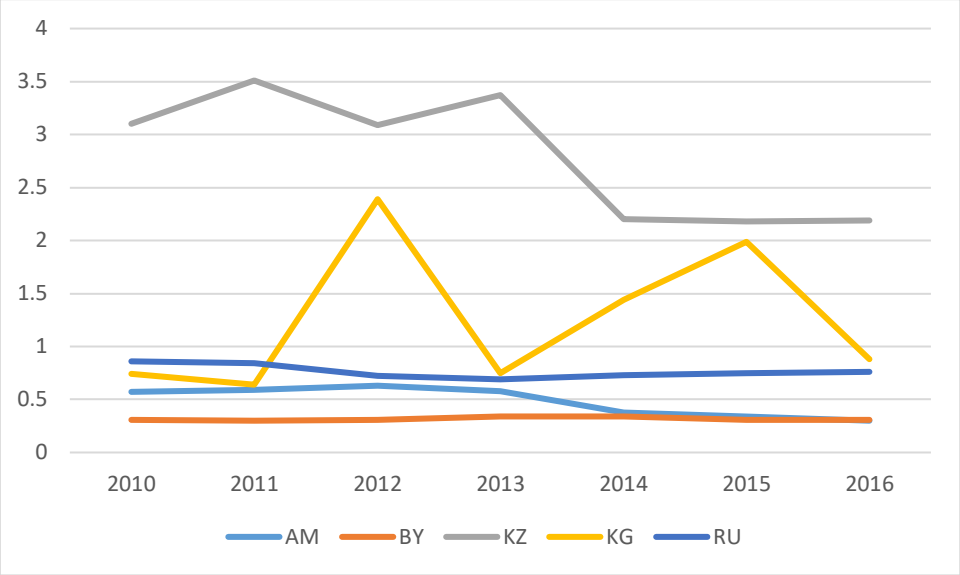
The impact of industrial development on the environment also depends on the pace of structural change in the economy. For example, there is a large variation in the intensity of energy use and rates of emission in different industrial sectors. Moreover, economies can shift production from high energy intensive sectors to low energy intensive ones. Industries that use low- and medium low-technology tend to be 'dirtier' in terms of emission inefficiency (UNIDO, 2017).

The sectoral intensity is defined as CO_2 emission from manufacturing (in physical measurement units such as tonnes) divided by manufacturing value added (MVA) in constant 2010 USD.

$$CO_2 \text{ emission per unit of value added} = \frac{\text{CO2 emission from manufacturing (in kg)}}{\text{MVA (constant USD)}} \quad (9)$$

Although Russia and Kazakhstan are the top emitters of CO_2 among the EAEU, the relative value of their CO_2 emission per unit of MVA dropped from 0.86 kg/USD in 2010 in Russia and 3.1 kg/USD in Kazakhstan to 0.76 kg/USD and 2.19 kg/USD in 2016, respectively. What is more, Kyrgyzstan is the only country within the EAEU where CO_2 emission increased in the period analysed. The relative value of its CO_2 emission per unit of MVA rose from 0.74 kg/USD in 2010 to 0.88 kg/USD in 2016, varying significantly within that period (Figure 24).

Figure 24: Dynamics of CO_2 emission per unit of MVA in the EAEU (kg/USD, constant 2010 price)



Source: UNCTADstat Data Portal

UNIDO experts calculate the green industrial performance index (GIP) – a tool to measure a country's performance in terms of green manufacturing. It consists of six indicators, reflecting the country's green industrial performance across the three dimensions of the GIP index: (1) The capacity to produce and export green manufactured goods; (2) The role of green manufacturing, and (3) Social and environmental aspects of green manufacturing (Table 17). Each of the six indicators is normalized within the range [0, 1], with higher scores representing better outcomes (except for the one "negative" indicator, CO_2 emission by manufacturing value added, for which lower values mean better performance). The GIP index can be used to analyse inclusive and sustainable industrial development at country level, following UNIDO's grouping by stage of industrialization: industrialized economies, emerging industrial economies, other developing economies and least developed countries (Upadhyaya, 2013).

Table 17: Composition of GIP index

First dimension: Capacity to produce and export green manufactured goods Indicator 1: Green manufacturing value added per capita Indicator 2: Green manufactured exports per capita
Second dimension: The role of green manufacturing Indicator 3: Share of green MVA in total MVA Indicator 4: Share of green manufactured exports in total manufactured exports
Third dimension: Social and environmental aspects of green manufacturing Indicator 5: Share of green manufacturing employment in total manufacturing employment Indicator 6: CO_2 emission from manufacturing per unit of manufacturing value added

Source: Moll de Alba and Todorov, 2018.

It is important to note that there is no common definition of environmental goods. Hence, different sources are used, including: a) the OECD list of environmental goods (Steenblik, 2005), b) the World Bank classification of 43 environmental goods (World Bank, 2007), c) the APEC classification of 54 environmental goods (Steenblik, 2005), and d) the renowned report "Measuring the green economy" produced by the U.S. Department of Commerce (2010).

According to Moll de Alba and Todorov, a product is considered green if it serves one of the following goals: 1) resource conservation, 2) environmental assessment, 3) energy conservation, 4) renewable/alternative energy, 5) pollution control.

The GIP index is computed for 104 economies. Yet the highest score (achieved by Germany, which also leads in the CIP index) is only 0.69. This reflects the fact that no single country leads in all six GIP indicators. According to the expanded green product list (Moll de Alba and Todorov, 2019), Germany is followed by Denmark (0.68), Czech Republic (0.61), Singapore (0.58) and the Republic of Korea (0.57).

It should be mentioned here that industrialized economies used to outperform developing economies in terms of green manufacturing, as they use energy efficiency technologies as well as renewable energy sources. The performance of EAEU in the GIP ranking differs. According to the latest available data, industrialized Russia and Belarus ranked 56 and 68 in 2015, with GIP scores of 0.11 and 0.08, respectively. Emerging industrial Kazakhstan ranked 78th with a score. of 0.05. Finally, developing Kyrgyzstan and Armenia ranked 83rd (0.04) and 90th (0.03). In general, while all EAEU countries managed to improve their positions compared to the previous

ranking, Belarus (+36), Kazakhstan (+25), Russia (+7), Armenia (+1) and Kyrgyzstan dropped 9 positions. One important observation is that Russia is the only country within the EAEU located in the GIP ranking's middle quantile group. Belarus, Kazakhstan and Kyrgyzstan are in the lower-middle group, while Armenia ranks in the bottom quantile. In other words, all EAEU countries face the tremendous challenge of improving their positions in the GIP ranking and move to the top performers group (Table 18).

Despite being the top GIP performer in the EAEU, Russia ranks only second both in the value of green MVA per capita and green manufactured exports per capita, following the other "manufacturing triad" countries, Kazakhstan and Belarus. Kazakhstan is the top performer in green MVA per capita (USD 19.56), is followed by Russia, Belarus, Kyrgyzstan and Armenia (USD 16.90, USD 13.99, USD 2.85 and USD 1.44, respectively). If we take a look at the top performers, the total value of green MVA per capita in Germany in 2015 was USD 1,001, USD 675 in Denmark, etc. The EAEU figures are extremely low in comparison.

When looking at green manufactured exports per capita, Belarus led the EAEU countries with USD 113.21in 2015, with Russia, Kazakhstan, Armenia and Kyrgyzstan following with USD 48.47, USD 12.24, USD 6.23 and USD 4.93, respectively. At the same time, this amount is much higher in top performing countries – USD 4,450 in Singapore, USD 2,355 in Denmark, etc.

In terms of green MVA in total MVA, EAEU countries have a similar rank with shares of around 1 per cent to 2 per cent, while this indicator varies between 10 per cent and 15 per cent in top performing countries. The situation is quite similar when looking at the share of green manufactured exports in total manufactured exports. It is as high as 5 per cent only in Belarus and Russia. At the same time, Russia is one of the world's leading performers in the share of green manufacturing employment in total manufacturing employment with 13 per cent. In the rest of the EAEU, this indicator varies at a level above 2 per cent. Finally, Belarus and Armenia outperform other EAEU countries in terms of CO_2 emission with 0.30 and 0.34 kg per unit of MVA, respectively, followed by Russia, Kyrgyzstan and Kazakhstan with 0.81, 1.99 and 2.35 kg per unit of MVA, respectively. Yet this indicator is far lower than 0.1 kg per unit of MVA in such countries as Switzerland (0.04), Ireland (0.04), Denmark (0.07), etc.

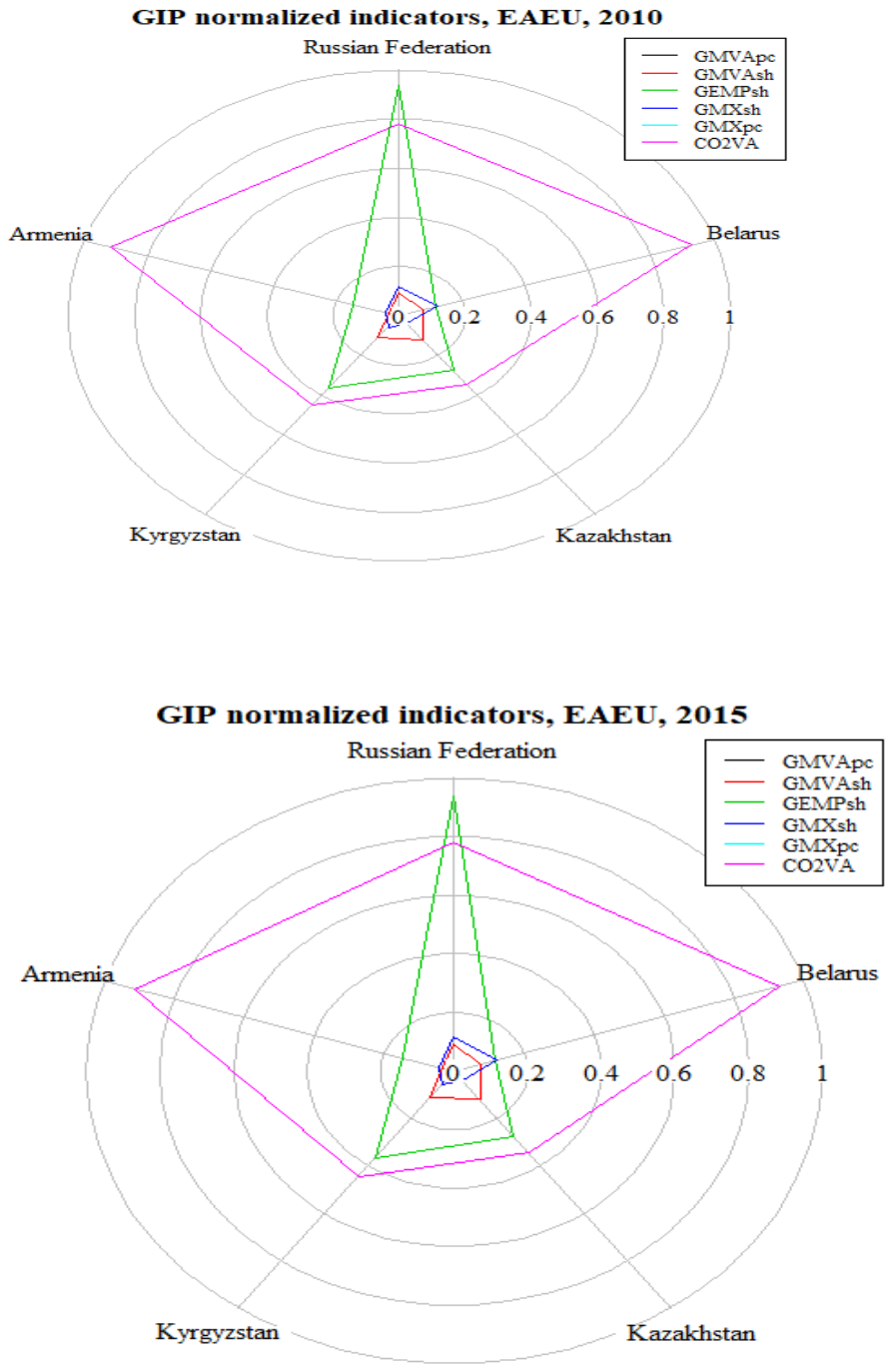
Table 18: Competitive green industrial performance indices of EAEU countries

	AM		BY		KZ		KG		RU	
	2010	**2015**	**2010**	**2015**	**2010**	**2015**	**2010**	**2015**	**2010**	**2015**
GIP rank	83	90	60	68	98	78	75	83	54	56
GIP score	0.03	0.03	0.08	0.08	0.00	0.05	0.04	0.04	0.11	0.11
GIP quintile	Lower middle	Bottom	Middle	Lower middle	Bottom	Lower middle	Lower middle		Middle	
Per capita indicators										
Green MVA p.c.	1.60	1.44	18.56	13.99	9.25	19.56	3.92	2.85	34.42	16.90
Green manufactured exports p.c.	7.47	6.23	101.24	113.21	6.97	12.24	3.05	4.93	32.11	48.47
Share indicators										
Share of green MVA in total MVA	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.02	0.03	0.01
Share of green manufactured exports in total manufactured exports	0.03	0.02	0.05	0.05	0.01	0.02	0.02	0.03	0.04	0.05
Share of green manufacturing employment in total manufacturing employment	0.01	0.02	0.02	0.02	0.02	0.04	0.07	0.05	0.12	0.13

Environmental indicators										
CO_2 emission from manufacturing per unit of MVA	0.55	0.34	0.31	0.30	3.39	2.35	0.62	1.99	0.89	0.81
GIP Indices										
GMVA p.c. index	0.00	0.00	0.02	0.01	0.01	0.02	0.00	0.00	0.03	0.02
Share of GMVA in total MVA index	0.03	0.04	0.08	0.07	0.06	0.12	0.15	0.11	0.15	0.09
Share of GEMP in total manufacturing employment index	0.11	0.15	0.11	0.11	0.16	0.28	0.54	0.36	0.88	0.94
Share of GMX in total MX index	0.06	0.04	0.09	0.12	0.02	0.04	0.03	0.06	0.07	0.12
GMX per capita index	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.01	0.01
CO_2 value added index	0.85	0.91	0.92	0.93	0.00	0.34	0.83	0.45	0.75	0.78

Source: UNIDO, 2019

Figure 25: GIP indicator scores of the EAEU, 2010, 2015



Source: Author, based on Moll de Alba and Todorov, 2019

Figure 25 compares the performance of EAEU countries based on their GIP ranking, using a radar-type chart. The chart emphasizes the untapped potential of green manufacturing in those countries, and highlights the difference in performance of each country. A closer examination of the underlying indicators comprised in the GIP index helps reveal a number of areas for potential improvements in the EAEU countries.

Russia, the top green industrial performer in the EAEU, leads the performance in terms of green manufacturing employment share and is the third strongest performer in green MVA share. On the other hand, Russia can improve its performance, particularly in CO_2 emission. Belarus leads the other EAEU countries in green manufactured exports per capita and has the lowest level of CO_2 emission, but has the capacity to further improve its performance. Kazakhstan, despite leading in green MVA per capita, has the best results in terms of CO_2 emission within the Union. Kyrgyzstan has room for improvement in its per capita indicators as well as level of CO_2 emission, whereas Armenia, despite good results in terms of CO_2 emission, has the potential to improve its performance in per capita indicators.

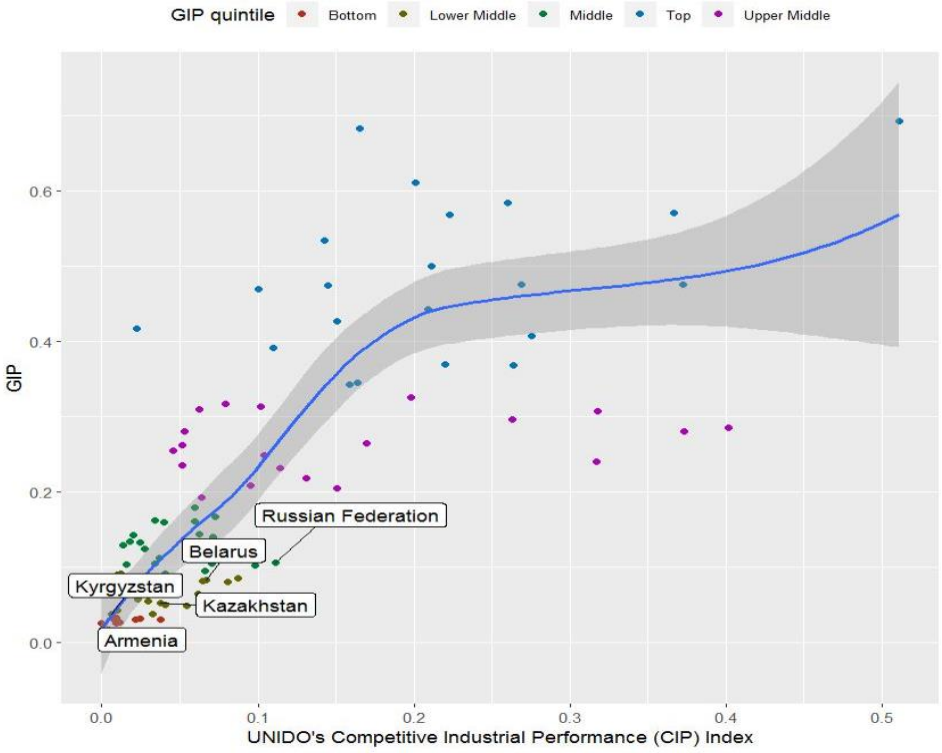
We use a Pearson linear correlation to compare the EAEU's GIP and CIP scores. GIP scores for the EAEU countries show a correlation of 0.99 with UNIDO's CIP index, i.e. the correlation is strong, and the greater the value of CIP, the higher the corresponding GIP values. When computing the Spearman rank correlation, it is slightly lower (0.90), but nonetheless quite strong. In order to be competitive in terms of industrial production as well as in "green" production, the EAEU countries should improve their performance in the mentioned indicators (Figure 26).

It must be reiterated that the pursuit of economic growth should not entail environmental damage. Ecology and environmental safety are not directly reflected in the Treaty on the EAEU. It is therefore important to develop environmental cooperation as one of the fundamental pillars of both bilateral and international relations of the EAEU countries. In the course of the integration process in the EAEU, environmental safety issues, along with economic development issues, should be given priority.

Nazarkulova and Shugaipova (2016) propose measures that can contribute to the improvement of international legal protection of the environment in the formation of common energy markets and other integration processes in the EAEU's economic sphere. First, the very first articles of the EAEU Treaty, which are devoted to the Union's principles and objectives, should prescribe that economic development may not come at the detriment of the environment as one of the major goals of economic integration. In addition, a separate paragraph devoted to ecological cooperation among the members should be included in the EAEU Treaty, and the relationship between

economic and environmental objectives should be taken into account in the "Main directions of economic development of the EAEU until 2030" (approved on 16 October 2015 at the meeting of the Supreme Eurasian Economic Council).

Figure 26: Correlation between GIP and CIP indices of the EAEU



Source: Author, based on Moll de Alba and Todorov (2019) and UNIDO (2019)

8. Industrial policies of EAEU countries

Industrial policy in the EAEU is carried out at three levels:

1) national industrial policies (competence of the parties),

2) coordinated industrial policy (joint competence of the parties and the Eurasian Economic Commission),

3) elements of an EAEU unified industrial policy (supranational competence of the EEC).

Industrial policy within the Union is implemented by the member states on the basis of the following principles:

1) equality and consideration of the member states' national interests,

2) mutual benefit,

3) fair competition,

4) non-discrimination,

5) transparency.

The objectives of the industrial policy within the Union are to accelerate and increase the sustainability of industrial development, increase the competitiveness of member states' industrial complexes, the implementation of effective cooperation aimed at increasing innovation activity, the elimination of barriers in the industrial sphere, including the movement of EAEU members' industrial goods.

In 2015, the EAEU countries developed the "Main directions of industrial cooperation within the framework of the Union", approved by the Intergovernmental Council, including priority economic activities for industrial cooperation and sensitive goods. This was a medium-term document for 5 years. The document was later forwarded for international expert inputs within the framework of cooperation with the United Nations Industrial Development Organization (UNIDO).

This strategic document aims to deepen cooperation, modernize existing production facilities and create new innovative industries and to develop new competitive export-oriented products. The parties agreed to form a new innovative economy by promoting cooperation in science, technology and innovation, as well as the creation of business and scientific infrastructure.

Paragraph 3 of the Decision of the Intergovernmental Council dated 8 September 2015, No. 9, which approved the "Main directions of industrial cooperation within the Eurasian Economic Union" provides for the approval of the "Plan for the development of acts and measures for the implementation of the main directions of industrial cooperation within the EAEU" at the level of the Commission Council. The draft Plan was developed jointly with the parties and approved by the Decision of the Commission Council on 17 March 2016. The document provides for the development of acts at various levels on the following key issues:

- import substitution, including an increase in the localization of production and deepening of industrial cooperation,

- increasing exports of manufactured products,

- the creation of new innovative industries and the modernization of enterprises in traditional industries.

To implement industrial cooperation within the Union, the member states, with advisory and coordination services provided by the Eurasian Economic Commission, should develop and implement the following measures:

1) promotion of mutually beneficial industrial cooperation to create high-tech, innovative and competitive products,

2) joint programmes and projects with the participation of member states, which are mutually beneficial basis,

3) joint technology platforms and industrial clusters,

4) other instruments promoting industrial cooperation.

The key indicators of industrial cooperation within the Union are:

- accelerating the growth of industrial production in member states,
- decreasing the gap in the level of labour productivity by gross value added between member states and between them and the industrialized world,
- intensifying the volume of cooperation and mutual supplies of industrial products,
- increasing the share of products of EAEU member states in the common market, including jointly produced goods, as well as a gradual rise in localization level,
- developing synergies based on joint development measures for industrial production and the increase in high-tech industrial activities in EAEU countries.

The prospects for a coherent industrial policy and cooperation in the EAEU are far from clear. According to the Treaty on the EAEU, industrial policy is the sovereign right of the member states, they develop and implement it independently (Article 92 of the Treaty). The analysis of the EAEU members' national industrial policies is presented in Table 19.

Table 19: Comparative analysis of EAEU countries' industrial policies

	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia
Type of industrial policy	Catching-up development policy, vertical	Catching-up development policy, vertical	Catching-up development policy, vertical	Catching-up development policy, horizontal	Compensatory, vertical
Goal of industrial policy	Export-oriented policy. modernization of infrastructure, increasing competitiveness of Armenian goods, and attracting foreign investment. Development of existing export industries and those industries with export potential. The long-term goal is the transformation into a country that produces knowledge-intensive and high-value goods.	Development of a competitive, innovative industrial complex, focussed on the creation of high productivity jobs and growth of labour productivity by value added of at least 50% of the European level. Increase in production, meeting global requirements and export capacity building.	Development of investment climate, export promotion, mass employment, modernization of infrastructure and of digital infrastructure. Expansion and "sophistication" of the existing range of products.	Diversified and export-oriented structure of industry, relying on its own resources and production base. Modernization and expansion of the capacities of existing manufacturing sectors. Cluster generation to improve industrial competitiveness in core products.	Formation of high-tech, competitive industry, ensuring transition from an export of raw materials type of development to an innovative type of development. Ensuring employment and improving the standard of living of citizens. Ensuring national defence and state security. Increase in the output of high value added products and stimulation of their export.
Priority activities of industrial policy	Mining, basic precious and non-ferrous metals, food, textile, construction, chemicals and chemical products, machinery and equipment, electrical machinery and apparatus.	Basic metals, machinery and equipment, chemicals and chemical products, radio, television and communication equipment, aircraft.	Basic metals, refinery, mining, chemicals and chemical products, construction, machinery and equipment.	Mining, refinery, construction, non-metallic mineral products, basic precious metals.	Basic metals, refinery, chemicals and chemical products, machinery and equipment, aircraft and spacecraft, construction.

Source: Author, based on national industrial development strategies of the EAEU.

Note: The type of industrial policy according to impact: "vertical" (selective) and "horizontal" (system-wide).

According to data in Table 19, the main goal of industrial cooperation within the EAEU is the implementation of a coherent industrial policy that provides for the acceleration of industrial development, increased competitiveness, technological modernization of industrial complexes and import substitution of industrial goods on the common market of the EAEU.

An analysis of the EAEU countries' national industrial development strategies and programmes reveals a high degree of convergence in terms of the development methodology of industrial policy, instruments and mechanisms of implementation. Nearly every country uses the following tools to support the implementation of industrial strategies and policies: measures to stimulate and support the export activities of national industrial firms, R&D, development of industrial clusters, development of small and medium-sized businesses, and government cost sharing of large national industrial projects.

Nevertheless, the main problem associated with the implementation of national industrial programmes in the EAEU is the programmes' autonomy. Each of the countries sets goals to increase production and export volumes according to its industry priorities. At the same time, there is little effort to form a common market within the EAEU, taking into account the specialization of its members for certain types of products. The countries of the Union view each other's domestic markets from the perspective of an accessible and capacious export market, while they view their national domestic markets from the perspective of import substitution with their own products.

In addition, there is a high degree of interlinkages in the exports to third countries. This leads to unfair competition and—taking into account the relevant industries' priorities and continued state support—to an increase in contradictions between the EAEU countries. It is therefore necessary to coordinate the EAEU members' national industrial policies based on mechanisms of deeper industrial cooperation, with the prospect of reaching a coordinated industrial policy in key sectors.

One of the main contradictions in the members' national programmes in terms of ensuring the competitiveness of industrial products, which requires greater coordination within the scope of the formation of a coherent industrial policy, is consideration by the EAEU members of the advantages of integration, primarily from the perspective of additional export opportunities, the development of target parameters for import substitution with input from their national manufacturers.

Russia, Belarus and Kazakhstan have set ambitious goals to increase the share of their production in the domestic market and to increase exports. However, their markets have a high degree of overlap. This leads to unfair competition and, taking into account the relevant industries' priorities and continued state support, to an increase in contradictions between them.

When looking at the national strategies and the development goals of the EAEU, we can conclude that the goals and objectives for development are practically the same for the five countries. Each has set itself the task of improving its international competitiveness, diversify its production, move towards an innovative path of development, etc. It is important to note that in addition to industrial development goals, approximately 70 per cent of the members' sectoral development priorities (i.e. the list of industries that EAEU countries have identified as priorities for development) are the same, and their national industrial complexes target the same export markets, including India, China and other emerging economies of the world.

The unique feature of the EAEU lies in the fact that all countries were once part of a single Union industrial complex. Consequently, they have experience in joint working and cooperative relationships, and although these have been destroyed to a significant degree, a comprehensive examination should be carried out to identify potential areas of possible cooperation.

To overcome the deficiencies of the EAEU member states' industrial development compared to industrialized countries, the EAEU countries need to sell their own industrial products in the EAEU's domestic markets, thereby increasing not only the volume of mutual trade in industrial products, but also forming industrial relations between the countries' enterprises. As in the EU, one of the positive economic effects of integration should be specialization and cooperation. In the long term, there will not only be an increase in mutual exports from EAEU countries to the common market, but also in the volume of jointly produced products. An increase in the share of high-tech activities in the industrial production of EAEU countries should be the result of effective integration of science and production. Active use of R&D results within the EAEU will contribute to achieving a sustainable synergistic effect from the joint development of industrial production in the EAEU (Dorzhieva, 2019).

Conclusion

The countries of the Eurasian Economic Union perform differently in such indicators as structure of the economy and level of development. Macroeconomic indicators characterize the EAEU as a Union of countries, with Russia dominating in economic terms. It accounts for 85 per cent of the Union's GDP, 80 per cent of its population, and has the highest average GDP per capita at nearly USD 12,000. Kazakhstan, Belarus, Armenia and Kyrgyzstan are small economies compared to Russia, since the size of their economies, domestic markets and foreign trade are considerably smaller.

The period analysed was characterized by an economic crisis in the EAEU at the end of 2014, amid the backdrop of falling oil prices, sanctions and a strong devaluation of the national currencies, which triggered declines in the region's economic indicators. Nevertheless, as a result of coordinated policy, the EAEU countries managed to turn around a negative trend in 2015-2016 into a positive one.

Services account for the largest share in the structure of gross value added by main type of economic activity in the EAEU, namely nearly 60 per cent, followed by industry (35 per cent) and agriculture (5 per cent). At the same time, the share of services has been increasing continuously amid a decline in the share of industry. This is a sign that a deindustrialization process is taking place in the Union.

Evaluating the EAEU's industrial performance, we can conclude that due to the size of its economy, Russia has the highest share of manufacturing value added in the EAEU at USD 228.129 billion or 85.90 per cent. Russia, Belarus and Kazakhstan account for almost the entire MVA within the EAEU (99.15 per cent). These countries are therefore referred to as the "manufacturing triad" of the EAEU. But both indicators—the share of the EAEU countries in world MVA and their share in world GDP—are extremely low (not much higher than 2 per cent).

Sustainable development goals promote inclusive and sustainable industrialization by addressing the role of manufacturing production and employment. According to Target 9.2, the performance in such indicators like MVA as a share of GDP and MVA per capita are expected to increase significantly, as is manufacturing employment as a share of total employment by 2030.

Throughout the period analysed, the share of the manufacturing sector in GDP declined steadily in nearly all EAEU countries, with the exception of Armenia, Belarus and Russia. MVA share in GDP is only high (over 23 per cent) in Belarus, while in the other countries, it varies from 10 per cent in Kazakhstan and Armenia to 13 per cent in Russia and Kyrgyzstan. The deindustrialization

process is generally premature for all EAEU countries and limits the possibilities of introducing large-scale industrial technologies.

At the same time, together with an increase in GDP per capita, there has been an upward trend in MVA per capita in the EAEU countries since 2010, except Kyrgyzstan. Russia is the leader in MVA per capita in the EAEU, with an amount of USD 1,585, Belarus ranks second (USD 1,563) and Kazakhstan third (USD 1,110). The remaining two countries, Armenia and Kyrgyzstan, have the lowest MVA per capita in the EAEU – USD 459 and 146, respectively, reflecting their low industrial productivity.

In 2017, total employment in the manufacturing sector of the five EAEU countries amounted to 4.61 per cent of their total population. The manufacturing sector employed 8.33 million people in the EAEU countries, amounting to 0.24 per cent of the world's working age population. Evidently, there was a strong decline in this indicator throughout the EAEU within the period 2010–2017.

If we take a look at employment composition by industry, we find that the majority of jobs in the EAEU countries is concentrated in the services sector – from 51 per cent in Armenia and Kyrgyzstan to 67 per cent in Russia. The level of manufacturing employment in total employment is only high (over 18 per cent) in Belarus, while in the other four countries, it is less than 10 per cent, except in Russia (14.2 per cent). At the same time, within the period analysed, there were no signs of expanding employment in the EAEU's industrial sector, except for Kazakhstan and Kyrgyzstan, resulting from their industrial policies aimed at supporting labour-intensive industrialization. We can thus conclude that industry is not the main source of new jobs in the EAEU countries.

SDG Target 9.4 promotes the reduction of CO_2 emission per unit of value added by 2030. In this regard, is important to note that the Treaty on the EAEU does not reserve a special section that regulates environmental factors involving the members. This factor could represent an additional area of cooperation to achieve long-term sustainable industrial growth.

Although Russia and Kazakhstan are the top emitters of CO_2 among the EAEU, the relative value of their CO_2 emission per unit of MVA dropped from 0.86 kg/USD in 2010 in Russia and 3.1 kg/USD in Kazakhstan to 0.76 kg/USD and 2.19 kg/USD in 2016, respectively. Moreover, Kyrgyzstan is the only country in the EAEU that improved in this indicator in the period analysed. The relative value of its CO_2 emission per unit of MVA rose from 0.74 kg/USD in 2010 to 0.88 kg/USD in 2016, varying significantly within the period As a result, among the "manufacturing triad" of the EAEU countries, Belarus has the best indicators at greening of manufacturing

industry with the lowest level of CO_2 emission per unit of MVA. In Armenia and Kyrgyzstan - the countries with a smaller role of industrial production in economic development, CO_2 emission is also at low levels. However, the figures indicate the insufficient level of industrial development rather than success in terms of energy efficiency in these countries.

Finally, SDG 9.b supposes that an increase in medium- and high-tech manufacturing value added in total value added supporting technology development, research and innovation, industrial diversification and value addition to commodities due to the increase in.

According to the research results, medium low-tech industries dominate (49 per cent) the technological structure of the EAEU countries' manufacturing sectors, mostly due to the value added of basic metals. In countries like Armenia and Belarus, the share of low-tech industries is higher (51.3 per cent and 43.1 per cent, respectively) as a result of the high value added of the food and beverages industry. Medium high- and high-tech industries account for only 18 per cent of value added, mostly due to the contribution of chemicals and chemical products, as well as machinery and equipment.

At the same time, industrial development generally entails a structural transition from resource-based and low-tech activities to medium high- and high-tech activities, requiring both higher technological intensity and labour productivity. An increase in the share of medium high- and high-tech industries in total MVA not only reflects the manufacturing sector's technological intensity, but also its capacity to introduce new technologies to other sectors. For example, medium high- and high-tech industries produce the machinery and equipment required not only by the manufacturing sector itself, but also by agriculture, mining and construction. Medium high- and high-tech industries produce a large variety of consumer goods – demand for such goods increases in proportion to the level of the population's income.

We found out that amid a slight structural change in Russia and Kazakhstan towards capital-intensive, medium high- and high-tech industries (0.5 per cent each), the MVA of Belarus is changing towards labour-intensive, low-tech industries (1.24 per cent); this worrying trend should be taken into account when formulating industrial policy. Nevertheless, the structure of manufacturing activities is fairly diversified in Russia and Belarus, where the coefficient of diversification is close to 1. Countries with no predominant share of any particular industry are less vulnerable to fluctuations. At the same time, the manufacturing sector's structure in Kazakhstan and Armenia is more concentrated, with a predominance of several industries in MVA, while Kyrgyzstan has the least diversified manufacturing industries in the EAEU.

As regards the structure of manufacturing employment, we can conclude that employment in low-tech industries dominates (41.9 per cent) the technological structure of manufacturing employment in the EAEU, mostly due to the high level of employment in the food and beverages industry. Armenia is the only country in the Union that demonstrated a constant increase in the share of employment in low-tech industries during the period analysed Medium-low tech industries rank second with a share of 31.5 per cent due to the high contribution of the metals and mineral products industries to employment. Finally, medium high- and high-tech industries rank third (26.5 per cent) due to the contribution of such sectors like chemicals and chemical products and machinery and equipment. In general, the share of employment in medium high- and high-tech industries is only high (over 30 per cent to 40 per cent) in Russia (39.8 per cent), Belarus (35.9 per cent) and Kazakhstan (30.3 per cent), while it remains less than 15 per cent in the remaining two countries. The "manufacturing triad" has the potential to produce and export a large range of technologically intensive goods, and this is their competitive advantage compared to other countries of the EAEU.

Another important indicator is manufacturing exports and its technological structure. According our research results, medium low-tech industries also dominate (55.1 per cent) the technological structure of the EAEU countries' manufacturing exports, mostly due to basic metals exports. At the same time, Armenia is the only country in the Union in which products from low-tech industries dominate manufacturing exports (58 per cent). In general, low-tech industries account for 25.4 per cent of the EAEU's total manufacturing exports, while medium high- and high-tech industries account for 19.5 per cent.

The structure of manufacturing exports has the highest diversification in Belarus, where the coefficient of diversification is mostly close to 1. That is, it is less subjected to changes in external market conditions, price fluctuations and competition from third countries. At the same time, the structure of manufacturing exports is mostly concentrated in Kazakhstan and Kyrgyzstan, with a predominance of several industries.

It is important to note that because of the dominance of the specialization in resource-based exports in the EAEU countries, no significant potential in the export of a number of manufacturing industries, particularly from high-tech industries, is not yet obvious. The fundamental limitation is the prevailing low competitiveness of high-tech manufacturing industries and the resulting weak integration of the EAEU's industrial production in the global markets.

UNIDO evaluates countries' industrial performance by calculating the CIP index. The analysis of UNIDO's CIP rank revealed multidirectional trends in the industrial competitiveness of the

EAEU countries. After a long systemic crisis associated with the collapse of the USSR and the transition from a planned to a market economy, only Belarus managed to improve its position in the ranking during the period analysed. Despite the fact that Russia's position weakened, it still ranks higher than other EAEU countries. Kyrgyzstan faces the most difficult situation: as a result of the continuing deterioration of its indicators in industry, the country has a low level of competitiveness.

Industrial performance in terms of sustainability, i.e. green development, is analysed using the GIP index. Russia outperforms other EAEU countries in this ranking as well. All EAEU countries should aim to decrease their CO_2 emission to improve their positions in the GIP ranking and move to the top performers group.

It is important to mention that the manufacturing sectors of countries that perform poorly in the CIP index are characterized by inefficiencies in the allocation of factors of production, such as labour and capital. According to our analysis, there is a strong correlation between the CIP and the GIP indices - the greater the value in the CIP, the higher the corresponding values in the GIP index.

Taking into account the size of Russia's domestic market and the purchasing power of its population, a steady demand for industrial goods, especially from labour-intensive and medium- and high-tech industries, both from national and foreign producers, is feasible. In this regard, the EAEU members are interested in Russia as the largest market for their industrial products. This is the big contradiction within the EAEU – the EAEU member states focus on this large market rather than to develop mutual industrial cooperation to expand their shares in global markets. Taking the similar structure of manufacturing production and export into account, they behave more like rivals, which stands in contradiction to the deepening of the integration process between the EAEU countries, especially of their industrial cooperation. In this regard, their national industrial policies must be coordinated with the prospect of reaching a synchronized industrial policy in the key sectors.

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Appendix

Appendix 1.

Table 1.1: GVA structure by economic activity in EAEU countries (constant 2010 prices, USD million)

	2010	2011	2012	2013	2014	2015	2016	2017
AM								
Agriculture, hunting, forestry, fishing	1574.78	1795.50	1965.67	2114.89	2243.36	2538.80	2412.58	2285.29
Mining, manufacturing, utilities	1453.50	1664.24	1761.00	1866.23	1832.68	1910.81	2057.45	2193.60
Manufacturing	907.09	1019.37	1061.50	1143.62	1212.11	1145.65	1273.09	1347.65
Construction	1614.36	1417.83	1486.57	1377.20	1315.57	1275.09	1095.41	1122.83
Wholesale, retail trade, restaurants and hotels	1270.57	1331.92	1411.57	1455.92	1522.51	1414.67	1481.68	1788.26
Transport, storage and communication	669.05	686.36	751.39	744.72	852.44	824.52	910.43	1000.01
Other activities	2249.14	2383.00	2538.46	2620.82	2775.74	2940.53	2984.44	3272.01
Total value added	8831.42	9309.10	9937.75	10218.37	10589.39	10973.11	11059.71	11848.83
BY								

Agriculture, hunting, forestry, fishing	5089.01	5473.02	5789.51	5578.39	5715.09	5577.14	5790.86	6113.47
Mining, manufacturing, utilities	14890.76	15867.73	16648.68	15994.87	16237.56	15264.49	15180.84	16089.26
Manufacturing	12883.20	14137.49	14980.28	14252.87	14274.39	13352.49	13322.29	14248.33
Construction	5364.62	5682.18	5118.36	5487.12	5414.47	4860.45	4094.32	3994.75
Wholesale, retail trade, restaurants and hotels	6960.33	8208.40	7795.50	8622.15	9208.18	8995.27	8372.40	8614.50
Transport, storage and communication	4521.58	4990.20	5449.70	5578.22	5799.96	5680.50	5848.25	6206.48
Other activities	13399.08	13421.32	13376.74	13244.97	13173.01	13106.76	12806.38	12471.71
Total value added	50225.40	53334.35	53964.76	54145.79	55074.45	53150.17	51866.40	53105.29
KZ								
Agriculture, hunting, forestry, fishing	6677.71	8181.05	6755.02	7514.58	7612.97	7881.41	8303.94	8532.46
Mining, manufacturing, utilities	48706.35	50514.05	51336.87	52824.75	53261.24	52545.30	52365.58	56187.84
Manufacturing	16760.91	17945.20	18486.08	19031.09	19330.82	19378.39	19724.37	20805.17
Construction	11404.44	11500.22	11856.72	12271.71	12836.21	13401.00	14392.65	14666.11

Wholesale, retail trade, restaurants and hotels	20516.12	22849.57	26134.75	29171.46	31490.00	31725.10	31197.31	32082.55
Transport, storage and communication	16464.11	17722.17	19529.97	21237.95	22812.26	24050.51	24764.29	25882.40
Other activities	39530.68	38567.73	41890.95	43217.39	44859.65	46505.93	47258.21	48155.15
Total value added	143299.45	149010.43	157488.50	166193.10	172829.58	176040.54	177948.55	184885.45
KG								
Agriculture, hunting, forestry, fishing	836.53	851.97	862.60	887.20	882.32	936.64	963.48	984.75
Mining, manufacturing, utilities	994.50	1067.02	820.83	1126.51	1107.89	1058.90	1117.05	1232.50
Manufacturing	808.34	852.95	617.78	898.49	872.82	818.30	866.15	931.88
Construction	264.75	271.39	351.95	395.54	502.79	584.69	639.12	684.59
Wholesale, retail trade, restaurants and hotels	823.43	912.09	1010.53	1085.43	1179.32	1265.01	1368.11	1422.00
Transport, storage and communication	434.97	473.40	514.63	571.06	601.93	613.53	585.61	607.17
Other activities	1107.05	1143.37	1165.85	1175.26	1183.64	1194.64	1213.41	1226.09
Total value added	4461.25	4714.03	4685.05	5190.10	5379.17	5545.90	5772.15	6032.85

RU								
Agriculture, hunting, forestry, fishing	51004.29	58180.62	57484.95	60087.43	60998.03	62754.80	64843.09	65616.04
Mining, manufacturing, utilities	377688.22	394282.11	406528.94	406991.91	408178.72	396458.19	397044.32	398920.72
Manufacturing	199669.50	212213.41	221902.49	223483.55	225159.73	214740.22	217206.98	217402.46
Construction	85673.91	92222.35	95757.70	94279.20	94042.78	93500.76	92435.14	93282.46
Wholesale, retail trade, restaurants and hotels	277439.64	286733.47	296787.76	297014.47	306893.85	297855.13	295124.76	302564.29
Transport, storage and communication	118329.71	125983.27	131017.66	130777.23	135148.62	131269.44	129992.58	133285.38
Other activities	422278.44	425820.04	445516.67	466887.56	466119.86	455804.03	454537.19	462840.96
Total value added	1332414.24	1380533.27	1431411.15	1457724.72	1470842.17	1437741.30	1434046.20	1456530.59
EAEU								
Agriculture, hunting, forestry, fishing	65182.32	74482.16	72857.75	76182.49	77451.77	79688.79	82313.95	83532.01
Mining, manufacturing, utilities	443733.33	463395.15	477096.32	478804.27	480618.09	467237.69	467765.24	474623.92

Manufacturing	231029.04	246168.42	257048.13	258809.62	260849.87	249435.05	252392.88	254735.49
Construction	104322.08	111093.97	114571.30	113810.77	114111.82	113621.99	112656.64	113750.74
Wholesale, retail trade, restaurants and hotels	307010.09	320035.45	333140.11	337349.43	350293.86	341255.18	337544.26	346471.60
Transport, storage and communication	140419.42	149855.40	157263.35	158909.18	165215.21	162438.50	162101.16	166981.44
Other activities	478564.39	481335.46	504488.67	527146.00	528111.90	519551.89	518799.63	527965.92
Total value added	1539231.76	1596901.18	1657487.21	1693472.08	1714714.76	1683451.02	1680693.01	1712403.01

Source: UNSD Data Portal, author's calculations

Table 1.2: Contribution of main industries of the economy to total GVA of the EAEU (%)

	2010	2011	2012	2013	2014	2015	2016	2017

AM								
Agriculture, hunting, forestry, fishing	17.83	19.29	19.78	20.70	21.18	23.14	21.81	19.29
Mining, manufacturing, utilities	6.19	4.66	3.94	3.03	2.28	2.81	1.63	0.89
Manufacturing	10.27	10.95	10.68	11.19	11.45	10.44	11.51	11.37
Construction	18.28	15.23	14.96	13.48	12.42	11.62	9.90	9.48
Wholesale, retail trade, restaurants and hotels	14.39	14.31	14.20	14.25	14.38	12.89	13.40	15.09
Transport, storage and communication	7.58	7.37	7.56	7.29	8.05	7.51	8.23	8.44
Other activities	47.43	49.87	50.64	51.60	52.67	51.99	55.15	58.97
Total value added	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
BY								
Agriculture, hunting, forestry, fishing	10.10	9.10	9.30	7.70	8.30	7.20	8.00	8.90
Mining, manufacturing, utilities	4.00	3.24	3.09	3.22	3.56	3.60	3.58	3.47
Manufacturing	25.65	26.51	27.76	26.32	25.92	25.12	25.69	26.83
Construction	10.68	10.65	9.48	10.13	9.83	9.14	7.89	7.52
Wholesale, retail trade, restaurants and hotels	13.86	15.39	14.45	15.92	16.72	16.92	16.14	16.22
Transport, storage and communication	9.00	9.36	10.10	10.30	10.53	10.69	11.28	11.69

Other activities	49.57	50.50	50.37	52.63	52.39	54.94	54.84	53.28
Total value added	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
KZ								
Agriculture, hunting, forestry, fishing	4.70	5.50	4.70	4.90	4.70	5.00	4.80	4.70
Mining, manufacturing, utilities	22.29	20.64	19.19	17.86	17.00	16.66	16.29	15.09
Manufacturing	11.70	12.04	11.74	11.45	11.18	11.01	11.08	11.25
Construction	7.96	7.72	7.53	7.38	7.43	7.61	8.09	7.93
Wholesale, retail trade, restaurants and hotels	14.32	15.33	16.59	17.55	18.22	18.02	17.53	17.35
Transport, storage and communication	11.49	11.89	12.40	12.78	13.20	13.66	13.92	14.00
Other activities	53.35	54.10	56.84	58.41	59.69	59.72	59.74	61.03
Total value added	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
KG								
Agriculture, hunting, forestry, fishing	18.80	18.00	18.50	16.40	16.50	15.40	14.30	13.80
Mining, manufacturing, utilities	4.17	3.00	8.04	1.85	2.26	3.18	2.22	1.04
Manufacturing	18.12	18.09	13.19	17.31	16.23	14.76	15.01	15.45
Construction	5.93	5.76	7.51	7.62	9.35	10.54	11.07	11.35
Wholesale, retail trade, restaurants and hotels	18.46	19.35	21.57	20.91	21.92	22.81	23.70	23.57

Transport, storage and communication	9.75	10.04	10.98	11.00	11.19	11.06	10.15	10.06
Other activities	52.98	55.15	52.76	56.82	55.66	56.12	57.40	58.36
Total value added	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
RU								
Agriculture, hunting, forestry, fishing	3.8	3.9	3.7	3.6	4.1	4.6	4.6	4.4
Mining, manufacturing, utilities	13.36	11.99	10.88	10.58	10.37	11.33	11.19	11
Manufacturing	14.99	15.37	15.5	15.33	15.31	14.94	15.15	14.93
Construction	6.43	6.68	6.69	6.47	6.39	6.5	6.45	6.4
Wholesale, retail trade, restaurants and hotels	20.82	20.77	20.73	20.38	20.87	20.72	20.58	20.77
Transport, storage and communication	8.88	9.13	9.15	8.97	9.19	9.13	9.06	9.15
Other activities	61.42	62.06	63.23	64.02	63.83	62.63	62.61	63.27
Total value added	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EAEU								
Agriculture, hunting, forestry, fishing	4.23	4.66	4.40	4.50	4.52	4.73	4.90	4.88
Mining, manufacturing, utilities	28.83	29.02	28.78	28.27	28.03	27.75	27.83	27.72
Manufacturing	6.78	6.96	6.91	6.72	6.65	6.75	6.70	6.64

Construction	19.95	20.04	20.10	19.92	20.43	20.27	20.08	20.23
Wholesale, retail trade, restaurants and hotels	9.12	9.38	9.49	9.38	9.64	9.65	9.64	9.75
Transport, storage and communication	60.16	59.39	58.46	57.56	57.97	58.35	58.20	57.93
Other activities	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: UNSD Data Portal, author's calculations

Appendix 2

Appendix 2.1 Industry structure of MVA in EAEU countries (current prices, USD million)

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
AM								
15 Food and beverages	413	442	424	436	447	387	233	271
16 Tobacco products	53	43	63	93	129	112	85	99

17 Textiles	1	1	1	1	1	1	0	0
18 Wearing apparel, fur	9	13	12	12	13	11	12	14
19 Leather, leather products and footwear	2	2	2	2	2	2	2	2
20 Wood products (excl. furniture)	1	2	2	2	2	1	2	2
21 Paper and paper products	13	16	19	28	30	26	14	16
22 Printing and publishing	16	17	16	17	17	15	13	15
23 Coke, refined petroleum products, nuclear fuel	...	...	...	...	...	0	...	...
24 Chemicals and chemical products	17	18	18	18	19	16	14	16
25 Rubber and plastics products	23	25	24	24	25	22	18	21
26 Non-metallic mineral products	33	36	34	35	36	31	27	32
27 Basic metals	107	115	110	113	116	101	270	313
28 Fabricated metal products	8	8	8	8	9	7	8	10
29 Machinery and equipment n.e.c.	9	10	9	10	10	9	6	7
30 Office, accounting and computing machinery (includes 32 and 33)	7	7	7	7	7	6	6	7

31 Electrical machinery and apparatus	4	4	4	4	4	4	8	9
32 Radio, television and communication equipment	...	...	…	...	...	...	...	...
33 Medical, precision and optical instruments	...	...	...	...	…	...	...	...
34 Motor vehicles, trailers, semi-trailers	...	...	...	...	...	0	...	...
35 Other transport equipment	0	0	0	0	0	0	0	0
36 Furniture; manufacturing n.e.c.	27	29	28	29	29	26	17	20
37 Recycling	...	...	...	...	...	...	...	...
D Total manufacturing	827	886	850	873	896	776	735	853
BY								
15 Food and beverages (includes 16)	2815	2474	2645	3747	3919	2435	2595	3029
16 Tobacco products	...	...	...	...	...	...	...	...
17 Textiles (includes 18)	686	945	889	961	851	667	244	285
18 Wearing apparel, fur	...	...	...	...	...	...	...	...
19 Leather, leather products and footwear	172	248	198	206	204	138	140	163
20 Wood products (excl. furniture)	303	394	347	447	478	478	389	454
21 Paper and paper products (includes 22)	314	394	320	359	330	224	106	124

22 Printing and publishing	...	...	...	...	...	...	67	78
23 Coke, refined petroleum products, nuclear fuel	581	979	1453	844	1074	737	274	320
24 Chemicals and chemical products	2072	3830	3414	2366	3540	2916	1582	1846
25 Rubber and plastics products	599	658	767	876	685	1176	415	484
26 Non-metallic mineral products	969	834	1111	1476	1418	960	597	697
27 Basic metals (includes 28)	1024	1342	1151	1135	879	674	86	100
28 Fabricated metal products	...	...	...	...	...	...	364	425
29 Machinery and equipment n.e.c.	1719	1895	2138	2149	1537	839	1218	1422
30 Office, accounting and computing machinery (includes 31, 32 and 33)	765	849	814	887	769	284	276	323
31 Electrical machinery and apparatus	...	...	...	...	...	340	317	370
32 Radio, television and communication equipment	...	...	...	...	...	...	...	...
33 Medical, precision and optical instruments	...	...	...	...	...	...	...	...
34 Motor vehicles, trailers, semi-trailers (includes 35)	748	1322	824	748	558	405	246	287

35 Other transport equipment	...	...	...	...	...	...	95	111
36 Furniture; manufacturing n.e.c. (includes 37)	499	588	551	670	618	704	314	366
37 Recycling	...	...	...	...	...	...	...	...
D Total manufacturing	13266	16753	16621	16873	16858	11655	9617	11224
KZ								
15 Food and beverages	3319	3916	4282	5480	5402	4462	3511	4059
16 Tobacco products	232	285	350	402	323	244	173	200
17 Textiles	91	90	119	119	91	77	69	80
18 Wearing apparel, fur	73	75	86	89	85	78	52	60
19 Leather, leather products and footwear	20	25	27	24	30	23	19	22
20 Wood products (excl. furniture)	56	68	81	70	70	59	45	53
21 Paper and paper products	112	135	136	153	150	117	102	118
22 Printing and publishing	113	149	179	179	133	131	78	90
23 Coke, refined petroleum products, nuclear fuel	2455	3115	3394	4027	3072	2251	1718	1986
24 Chemicals and chemical products	660	923	1041	1594	1481	1235	931	1077
25 Rubber and plastics products	288	382	402	400	378	304	232	269

26 Non-metallic mineral products	959	1197	1431	1766	1710	1377	911	1053
27 Basic metals	6109	8256	8379	7274	6704	6429	5992	6928
28 Fabricated metal products	660	715	769	859	746	584	487	563
29 Machinery and equipment n.e.c.	1080	1269	1369	1460	1326	927	759	878
30 Office, accounting and computing machinery (includes 32 and 33)	42	47	66	68	61	47	35	40
31 Electrical machinery and apparatus	234	235	259	294	273	206	204	236
32 Radio, television and communication equipment	...	...	...	...	...	...	...	...
33 Medical, precision and optical instruments	...	...	...	...	...	...	...	...
34 Motor vehicles, trailers, semi-trailers	54	114	232	436	439	169	68	79
35 Other transport equipment	73	180	266	301	213	107	79	92
36 Furniture; manufacturing n.e.c.	130	179	182	174	160	120	88	102
37 Recycling	...	...	...	...	...	...	...	...
D Total manufacturing	16761	21356	23048	25166	22846	18947	15554	17983
KG								
15 Food and beverages	111	160	167	251	164	138	137	154

16 Tobacco products	10	8	4	6	2	0	0	0
17 Textiles	9	10	14	20	4	5	3	3
18 Wearing apparel, fur	25	42	45	68	37	29	36	40
19 Leather, leather products and footwear	1	1	1	1	2	3	2	3
20 Wood products (excl. furniture)	2	2	3	4	4	3	3	3
21 Paper and paper products	4	4	4	7	4	3	8	9
22 Printing and publishing	10	11	8	12	7	6	1	2
23 Coke ,refined petroleum products, nuclear fuel	12	11	8	12	30	37	36	41
24 Chemicals and chemical products	5	7	16	23	14	6	5	6
25 Rubber and plastics products	8	12	10	15	17	10	12	14
26 Non-metallic mineral products	42	55	88	132	103	83	59	66
27 Basic metals	573	799	397	597	670	626	729	822
28 Fabricated metal products	7	8	8	12	14	12	17	20
29 Machinery and equipment n.e.c.	8	17	13	20	7	4	4	4
30 Office, accounting and computing machinery (includes 32 and 33)	0	0	0	0	0	0	0	1

31 Electrical machinery and apparatus	12	13	18	27	20	15	14	16
32 Radio, television and communication equipment	2	0	0	0	...	...	...	...
33 Medical, precision and optical instruments	1	1	1	2	...	...	...	...
34 Motor vehicles, trailers, semi-trailers	2	4	6	10	5	3	6	6
35 Other transport equipment	0	1	1	1	0	0	0	0
36 Furniture; manufacturing n.e.c.	4	5	6	9	7	5	5	5
37 Recycling	1	1	0	...	...	...	...	...
D Total manufacturing	849	1172	819	1230	1110	991	1077	1214
RU								
15 Food and beverages	31061	31235	37377	40939	34154	22958	22684	29606
16 Tobacco products	2256	2500	2939	3004	2347	1768	1593	2079
17 Textiles	1323	1481	1459	1451	1331	1040	968	1264
18 Wearing apparel, fur	1464	2105	2226	2601	2223	1419	1274	1662
19 Leather, leather products and footwear	621	656	700	830	643	414	488	637
20 Wood products (excl. furniture)	4301	4016	4117	4789	4573	3216	3013	3932
21 Paper and paper products	3949	4897	4357	4722	4386	3790	4072	5315
22 Printing and publishing	3702	3535	3855	3951	3808	2822	2445	3190

23 Coke, refined petroleum products, nuclear fuel (excludes processing of nuclear fuel)	36696	54811	59079	57869	48146	26135	20946	27338
24 Chemicals and chemical products	20357	22177	24533	24094	25031	24191	21281	27776
25 Rubber and plastics products	4423	4005	4583	5371	4054	3196	3133	4089
26 Non-metallic mineral products	8623	10776	12457	12362	10749	6859	6242	8147
27 Basic metals	28084	34921	33795	29643	33581	28444	25799	33673
28 Fabricated metal products	5593	4329	6998	8127	6763	5324	5148	6719
29 Machinery and equipment n.e.c.	11705	15734	17996	16341	14150	9621	8047	10503
30 Office, accounting and computing machinery	498	600	712	709	676	502	474	619
31 Electrical machinery and apparatus	4966	5185	6132	5955	5272	3805	3393	4429
32 Radio, television and communication equipment	...	...	...	...	...	...	...	...
33 Medical, precision and optical instruments	4540	4365	6197	6918	6865	5615	4858	6341
34 Motor vehicles, trailers, semi-trailers	4501	6569	8429	6824	6392	3291	3448	4501
35 Other transport equipment	2362	...	5201	3209	2822	2412	1693	...

36 Furniture; manufacturing n.e.c.	3548	3325	3733	3865	3913	2674	1873	2445
37 Recycling	1601	1155	1866	1870	2311	1578	856	1117
D Total manufacturing	195425	232465	260789	260056	239315	173077	155434	187591
EAEU	227128	272632	302127	304198	281025	205446	182417	218865

Source: UNCTADstat Data Portal

Appendix 2.2 Contribution of individual industries to MVA in EAEU countries (%)

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
AM								
15 Food and beverages	49.90	49.90	49.90	49.90	49.90	49.90	31.71	31.71
16 Tobacco products	6.37	4.86	7.37	10.60	14.44	14.44	11.57	11.57
17 Textiles	0.07	0.07	0.07	0.07	0.07	0.07	0.05	0.05

18 Wearing apparel, fur	1.13	1.42	1.42	1.42	1.42	1.42	1.60	1.60
19 Leather, leather products and footwear	0.19	0.19	0.19	0.19	0.19	0.19	0.23	0.23
20 Wood products (excl. furniture)	0.18	0.18	0.18	0.18	0.18	0.18	0.24	0.24
21 Paper and paper products	1.55	1.76	2.28	3.18	3.33	3.33	1.89	1.89
22 Printing and publishing	1.91	1.91	1.91	1.91	1.91	1.91	1.70	1.70
23 Coke, refined petroleum products, nuclear fuel	…	…	…	…	…	…	…	…
24 Chemicals and chemical products	2.07	2.07	2.07	2.07	2.07	2.07	1.91	1.91
25 Rubber and plastics products	2.78	2.78	2.78	2.78	2.78	2.78	2.51	2.51
26 Non-metallic mineral products	4.04	4.04	4.04	4.04	4.04	4.04	3.73	3.73
27 Basic metals	12.99	12.99	12.99	12.99	12.99	12.99	36.73	36.73
28 Fabricated metal products	0.96	0.96	0.96	0.96	0.96	0.96	1.12	1.12
29 Machinery and equipment n.e.c.	1.11	1.11	1.11	1.11	1.11	1.11	0.83	0.83
30 Office, accounting and computing machinery (includes 32 and 33)	0.82	0.82	0.82	0.82	0.82	0.82	0.79	0.79
31 Electrical machinery and apparatus	0.50	0.50	0.50	0.50	0.50	0.50	1.05	1.05
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	…	…	…	…	…	…	…	…

34 Motor vehicles, trailers, semi-trailers	…	…	…	…	…	…	…	…
35 Other transport equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04
36 Furniture; manufacturing n.e.c.	3.29	3.29	3.29	3.29	3.29	3.29	2.29	2.29
37 Recycling	…	…	…	…	…	…	…	…
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
BY								
15 Food and beverages (includes 16)	21.22	14.77	15.91	22.21	23.25	20.89	26.98	26.98
16 Tobacco products	…	…	…	…	…	…	…	…
17 Textiles (includes 18)	5.17	5.64	5.35	5.70	5.05	5.72	2.54	2.54
18 Wearing apparel, fur	…	…	…	…	…	…	3.03	3.03
19 Leather, leather products and footwear	1.30	1.48	1.19	1.22	1.21	1.18	1.46	1.46
20 Wood products (excl. furniture)	2.28	2.35	2.09	2.65	2.83	4.10	4.05	4.05
21 Paper and paper products (includes 22)	2.37	2.35	1.92	2.13	1.96	1.92	1.10	1.10
22 Printing and publishing	…	…	…	…	…	…	0.70	0.70
23 Coke, refined petroleum products, nuclear fuel	4.38	5.85	8.74	5.00	6.37	6.33	2.85	2.85
24 Chemicals and chemical products	15.62	22.86	20.54	14.02	21.00	25.02	16.45	16.45
25 Rubber and plastics products	4.51	3.93	4.61	5.19	4.06	10.09	4.31	4.31
26 Non-metallic mineral products	7.31	4.98	6.69	8.75	8.41	8.24	6.21	6.21

27 Basic metals (includes 28)	7.72	8.01	6.93	6.73	5.21	5.78	0.89	0.89
28 Fabricated metal products	…	…	…	…	…	…	3.79	3.79
29 Machinery and equipment n.e.c.	12.96	11.31	12.86	12.73	9.12	7.20	12.67	12.67
30 Office, accounting and computing machinery (includes 31, 32 and 33)	5.77	5.07	4.90	5.26	4.56	2.44	2.87	2.87
31 Electrical machinery and apparatus	…	…	…	…	…	2.92	3.29	3.29
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	…	…	…	…	…	…	…	…
34 Motor vehicles, trailers, semi-trailers (includes 35)	5.64	7.89	4.96	4.44	3.31	3.47	2.56	2.56
35 Other transport equipment	…	…	…	…	…	…	0.99	0.99
36 Furniture; manufacturing n.e.c. (includes 37)	3.76	3.51	3.32	3.97	3.66	6.04	3.26	3.26
37 Recycling	…	…	…	…	…	…	…	…
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
KZ								
15 Food and beverages	19.80	18.34	18.58	21.78	23.64	23.55	22.57	22.57
16 Tobacco products	1.39	1.33	1.52	1.60	1.41	1.29	1.11	1.11
17 Textiles	0.54	0.42	0.52	0.47	0.40	0.40	0.44	0.44
18 Wearing apparel, fur	0.43	0.35	0.37	0.35	0.37	0.41	0.33	0.33

19 Leather, leather products and footwear	0.12	0.12	0.12	0.09	0.13	0.12	0.12	0.12
20 Wood products (excl. furniture)	0.34	0.32	0.35	0.28	0.31	0.31	0.29	0.29
21 Paper and paper products	0.67	0.63	0.59	0.61	0.66	0.62	0.66	0.66
22 Printing and publishing	0.67	0.70	0.78	0.71	0.58	0.69	0.50	0.50
23 Coke, refined petroleum products, nuclear fuel	14.65	14.59	14.73	16.00	13.45	11.88	11.04	11.04
24 Chemicals and chemical products	3.93	4.32	4.52	6.33	6.48	6.52	5.99	5.99
25 Rubber and plastics products	1.72	1.79	1.74	1.59	1.65	1.60	1.49	1.49
26 Non-metallic mineral products	5.72	5.60	6.21	7.02	7.48	7.27	5.86	5.86
27 Basic metals	36.45	38.66	36.35	28.90	29.34	33.93	38.53	38.53
28 Fabricated metal products	3.94	3.35	3.34	3.41	3.27	3.08	3.13	3.13
29 Machinery and equipment n.e.c.	6.44	5.94	5.94	5.80	5.80	4.89	4.88	4.88
30 Office, accounting and computing machinery (includes 32 and 33)	0.25	0.22	0.29	0.27	0.27	0.25	0.22	0.22
31 Electrical machinery and apparatus	1.40	1.10	1.12	1.17	1.19	1.09	1.31	1.31
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	…	…	…	…	…	…	…	…
34 Motor vehicles, trailers, semi-trailers	0.32	0.53	1.01	1.73	1.92	0.89	0.44	0.44

35 Other transport equipment	0.44	0.84	1.15	1.19	0.93	0.57	0.51	0.51
36 Furniture; manufacturing n.e.c.	0.77	0.84	0.79	0.69	0.70	0.63	0.57	0.57
37 Recycling	…	…	…	…	…	…	…	…
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
KG								
15 Food and beverages	13.13	13.65	20.39	20.40	14.77	13.96	12.72	12.71
16 Tobacco products	1.17	0.66	0.50	0.50	0.16	0.02	0.02	0.02
17 Textiles	1.04	0.86	1.66	1.66	0.38	0.49	0.26	0.26
18 Wearing apparel, fur	2.94	3.61	5.53	5.53	3.29	2.90	3.32	3.32
19 Leather, leather products and footwear	0.12	0.07	0.11	0.11	0.17	0.33	0.21	0.21
20 Wood products (excl. furniture)	0.21	0.17	0.32	0.32	0.32	0.27	0.25	0.25
21 Paper and paper products	0.50	0.31	0.55	0.55	0.34	0.35	0.76	0.76
22 Printing and publishing	1.21	0.96	0.99	0.99	0.59	0.63	0.14	0.14
23 Coke ,refined petroleum products, nuclear fuel	1.41	0.90	1.00	1.00	2.71	3.77	3.35	3.34
24 Chemicals and chemical products	0.55	0.63	1.97	1.83	1.30	0.65	0.46	0.46
25 Rubber and plastics products	0.94	1.03	1.20	1.20	1.56	1.04	1.12	1.12
26 Non-metallic mineral products	4.92	4.68	10.74	10.75	9.32	8.34	5.43	5.43
27 Basic metals	67.56	68.20	48.54	48.55	60.35	63.18	67.69	67.68
28 Fabricated metal products	0.81	0.69	0.98	0.98	1.23	1.25	1.62	1.62

29 Machinery and equipment n.e.c.	0.91	1.45	1.61	1.61	0.61	0.37	0.34	0.34
30 Office, accounting and computing machinery (includes 32 and 33)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31 Electrical machinery and apparatus	1.37	1.08	2.17	2.17	1.79	1.56	1.34	1.34
32 Radio, television and communication equipment	0.21	0.04	0.02	0.02	…	…	…	…
33 Medical, precision and optical instruments	0.11	0.08	0.13	0.13	…	…	…	…
34 Motor vehicles, trailers, semi-trailers	0.26	0.37	0.78	0.78	0.42	0.34	0.53	0.53
35 Other transport equipment	0.04	0.06	0.07	0.07	0.00	0.00	0.00	0.00
36 Furniture; manufacturing n.e.c.	0.52	0.45	0.70	0.70	0.66	0.52	0.42	0.42
37 Recycling	0.07	0.04	0.03	…	…	…	…	…
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
RU								
15 Food and beverages	15.89	13.44	14.33	15.74	14.27	13.26	14.59	15.78
16 Tobacco products	1.15	1.08	1.13	1.16	0.98	1.02	1.02	1.11
17 Textiles	0.68	0.64	0.56	0.56	0.56	0.60	0.62	0.67
18 Wearing apparel, fur	0.75	0.91	0.85	1.00	0.93	0.82	0.82	0.89
19 Leather, leather products and footwear	0.32	0.28	0.27	0.32	0.27	0.24	0.31	0.34
20 Wood products (excl. furniture)	2.20	1.73	1.58	1.84	1.91	1.86	1.94	2.10
21 Paper and paper products	2.02	2.11	1.67	1.82	1.83	2.19	2.62	2.83
22 Printing and publishing	1.89	1.52	1.48	1.52	1.59	1.63	1.57	1.70

23 Coke, refined petroleum products, nuclear fuel (excludes processing of nuclear fuel)	18.78	23.58	22.65	22.25	20.12	15.10	13.48	14.57
24 Chemicals and chemical products	10.42	9.54	9.41	9.26	10.46	13.98	13.69	14.81
25 Rubber and plastics products	2.26	1.72	1.76	2.07	1.69	1.85	2.02	2.18
26 Non-metallic mineral products	4.41	4.64	4.78	4.75	4.49	3.96	4.02	4.34
27 Basic metals	14.37	15.02	12.96	11.40	14.03	16.43	16.60	17.95
28 Fabricated metal products	2.86	1.86	2.68	3.12	2.83	3.08	3.31	3.58
29 Machinery and equipment n.e.c.	5.99	6.77	6.90	6.28	5.91	5.56	5.18	5.60
30 Office, accounting and computing machinery	0.25	0.26	0.27	0.27	0.28	0.29	0.31	0.33
31 Electrical machinery and apparatus	2.54	2.23	2.35	2.29	2.20	2.20	2.18	2.36
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	2.32	1.88	2.38	2.66	2.87	3.24	3.13	3.38
34 Motor vehicles, trailers, semi-trailers	2.30	2.83	3.23	2.62	2.67	1.90	2.22	2.40
35 Other transport equipment	1.21	…	1.99	1.23	1.18	1.39	1.09	…
36 Furniture; manufacturing n.e.c.	1.82	1.43	1.43	1.49	1.64	1.55	1.21	1.30
37 Recycling	0.82	0.50	0.72	0.72	0.97	0.91	0.55	0.60
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: UNCTADstat Data Portal, author's calculations

Appendix 2.3 Relative structural change in MVA in EAEU countries (%)

Coefficient of relative structural change	**d_{2rel} (2010-2017)**	**%**	**d_{2rel} (2016-2017)**	**%**
AM				
15 Food and beverages	-0.36	**0.13**	0.00	**0.00**
16 Tobacco products	0.82	**0.67**	0.00	**0.00**
17 Textiles	-0.23	**0.05**	0.00	**0.00**
18 Wearing apparel, fur	0.42	**0.18**	0.00	**0.00**
19 Leather, leather products and footwear	0.20	**0.04**	0.00	**0.00**
20 Wood products (excl. furniture)	0.31	**0.10**	0.00	**0.00**
21 Paper and paper products	0.22	**0.05**	0.00	**0.00**
22 Printing and publishing	-0.11	**0.01**	0.00	**0.00**
23 Coke, refined petroleum products, nuclear fuel	…	**…**	…	**…**
24 Chemicals and chemical products	-0.08	**0.01**	0.00	**0.00**
25 Rubber and plastics products	-0.10	**0.01**	0.00	**0.00**
26 Non-metallic mineral products	-0.08	**0.01**	0.00	**0.00**
27 Basic metals	1.83	**3.34**	0.00	**0.00**
28 Fabricated metal products	0.17	**0.03**	0.00	**0.00**
29 Machinery and equipment n.e.c.	-0.26	**0.07**	0.00	**0.00**
30 Office, accounting and computing machinery (includes 32 and 33)	-0.03	**0.00**	0.00	**0.00**
31 Electrical machinery and apparatus	1.10	**1.20**	0.00	**0.00**
32 Radio, television and communication equipment	…	**…**	…	**…**
33 Medical, precision and optical instruments	…	**…**	…	**…**
34 Motor vehicles, trailers, semi-trailers	…	**…**	…	**…**
35 Other transport equipment	0.00	**0.00**	0.00	**0.00**
36 Furniture; manufacturing n.e.c.	-0.30	**0.09**	0.00	**0.00**
37 Recycling	…	**…**	…	**…**
BY				
15 Food and beverages (includes 16)	0.27	**0.07**	0.00	**0.00**
16 Tobacco products	…	**…**	…	**…**
17 Textiles (includes 18)	-0.51	**0.26**	0.00	**0.00**
18 Wearing apparel, fur	…	**…**	0.00	**0.00**
19 Leather, leather products and footwear	0.12	**0.01**	0.00	**0.00**

20 Wood products (excl. furniture)	0.77	**0.59**	0.00	**0.00**
21 Paper and paper products (includes 22)	-0.53	**0.29**	0.00	**0.00**
22 Printing and publishing	…	**…**	0.00	**0.00**
23 Coke, refined petroleum products, nuclear fuel	-0.35	**0.12**	0.00	**0.00**
24 Chemicals and chemical products	0.05	**0.00**	0.00	**0.00**
25 Rubber and plastics products	-0.04	**0.00**	0.00	**0.00**
26 Non-metallic mineral products	-0.15	**0.02**	0.00	**0.00**
27 Basic metals (includes 28)	-0.88	**0.78**	0.00	**0.00**
28 Fabricated metal products	…	**…**	0.00	**0.00**
29 Machinery and equipment n.e.c.	-0.02	**0.00**	0.00	**0.00**
30 Office, accounting and computing machinery (includes 31, 32 and 33)	-0.50	**0.25**	0.00	**0.00**
31 Electrical machinery and apparatus	...	...	0.00	**0.00**
32 Radio, television and communication equipment	…	…	…	**…**
33 Medical, precision and optical instruments	…	…	…	**…**
34 Motor vehicles, trailers, semi-trailers (includes 35)	-0.55	**0.30**	0.00	**0.00**
35 Other transport equipment	…	…	0.00	**0.00**
36 Furniture; manufacturing n.e.c. (includes 37)	-0.13	**0.02**	0.00	**0.00**
37 Recycling	…	…	…	**…**
KZ				
15 Food and beverages	0.14	**0.02**	0.00	**0.00**
16 Tobacco products	-0.20	**0.04**	0.00	**0.00**
17 Textiles	-0.19	**0.03**	0.00	**0.00**
18 Wearing apparel, fur	-0.23	**0.05**	0.00	**0.00**
19 Leather, leather products and footwear	0.03	**0.00**	0.00	**0.00**
20 Wood products (excl. furniture)	-0.13	**0.02**	0.00	**0.00**
21 Paper and paper products	-0.02	**0.00**	0.00	**0.00**
22 Printing and publishing	-0.26	**0.07**	0.00	**0.00**
23 Coke, refined petroleum products, nuclear fuel	-0.25	**0.06**	0.00	**0.00**
24 Chemicals and chemical products	0.52	**0.27**	0.00	**0.00**
25 Rubber and plastics products	-0.13	**0.02**	0.00	**0.00**
26 Non-metallic mineral products	0.02	**0.00**	0.00	**0.00**
27 Basic metals	0.06	**0.00**	0.00	**0.00**
28 Fabricated metal products	-0.21	**0.04**	0.00	**0.00**

29 Machinery and equipment n.e.c.	-0.24	**0.06**	0.00	**0.00**
30 Office, accounting and computing machinery (includes 32 and 33)	-0.11	**0.01**	0.00	**0.00**
31 Electrical machinery and apparatus	-0.06	**0.00**	0.00	**0.00**
32 Radio, television and communication equipment	…	…	…	…
33 Medical, precision and optical instruments	…	…	…	…
34 Motor vehicles, trailers, semi-trailers	0.35	**0.13**	0.00	**0.00**
35 Other transport equipment	0.17	**0.03**	0.00	**0.00**
36 Furniture; manufacturing n.e.c.	-0.27	**0.07**	0.00	**0.00**
37 Recycling	…	…	…	…
KG				
15 Food and beverages	-0.03	**0.00**	0.00	**0.00**
16 Tobacco products	-0.98	**0.96**	0.15	**0.02**
17 Textiles	-0.75	**0.57**	0.00	**0.00**
18 Wearing apparel, fur	0.13	**0.02**	0.00	**0.00**
19 Leather, leather products and footwear	0.81	**0.66**	0.00	**0.00**
20 Wood products (excl. furniture)	0.19	**0.04**	0.00	**0.00**
21 Paper and paper products	0.52	**0.27**	0.00	**0.00**
22 Printing and publishing	-0.89	**0.78**	0.00	**0.00**
23 Coke ,refined petroleum products, nuclear fuel	1.37	**1.87**	0.00	**0.00**
24 Chemicals and chemical products	-0.16	**0.03**	0.00	**0.00**
25 Rubber and plastics products	0.20	**0.04**	0.00	**0.00**
26 Non-metallic mineral products	0.10	**0.01**	0.00	**0.00**
27 Basic metals	0.00	**0.00**	0.00	**0.00**
28 Fabricated metal products	0.99	**0.98**	0.00	**0.00**
29 Machinery and equipment n.e.c.	-0.63	**0.40**	0.00	**0.00**
30 Office, accounting and computing machinery (includes 32 and 33)	0.00	**0.00**	0.00	**0.00**
31 Electrical machinery and apparatus	-0.02	**0.00**	0.00	**0.00**
32 Radio, television and communication equipment	…	…	…	…
33 Medical, precision and optical instruments	…	…	…	…
34 Motor vehicles, trailers, semi-trailers	1.03	**1.07**	0.00	**0.00**
35 Other transport equipment	0.00	0.00	0.00	**0.00**
36 Furniture; manufacturing n.e.c.	-0.19	**0.04**	0.00	**0.00**
37 Recycling	…	…	…	…

RU				
15 Food and beverages	-0.01	**0.00**	0.08	**0.01**
16 Tobacco products	-0.04	**0.00**	0.08	**0.01**
17 Textiles	0.00	**0.00**	0.08	**0.01**
18 Wearing apparel, fur	0.18	**0.03**	0.08	**0.01**
19 Leather, leather products and footwear	0.07	**0.00**	0.08	**0.01**
20 Wood products (excl. furniture)	-0.05	**0.00**	0.08	**0.01**
21 Paper and paper products	0.40	**0.16**	0.08	**0.01**
22 Printing and publishing	-0.10	**0.01**	0.08	**0.01**
23 Coke, refined petroleum products, nuclear fuel (excludes processing of nuclear fuel)	-0.22	**0.05**	0.08	**0.01**
24 Chemicals and chemical products	0.42	**0.18**	0.08	**0.01**
25 Rubber and plastics products	-0.04	**0.00**	0.08	**0.01**
26 Non-metallic mineral products	-0.02	**0.00**	0.08	**0.01**
27 Basic metals	0.25	**0.06**	0.08	**0.01**
28 Fabricated metal products	0.25	**0.06**	0.08	**0.01**
29 Machinery and equipment n.e.c.	-0.07	**0.00**	0.08	**0.01**
30 Office, accounting and computing machinery	0.30	**0.09**	0.08	**0.01**
31 Electrical machinery and apparatus	-0.07	**0.01**	0.08	**0.01**
32 Radio, television and communication equipment	…	…	…	…
33 Medical, precision and optical instruments	0.46	**0.21**	0.08	**0.01**
34 Motor vehicles, trailers, semi-trailers	0.04	**0.00**	0.08	**0.01**
35 Other transport equipment	…	…	…	…
36 Furniture; manufacturing n.e.c.	-0.28	**0.08**	0.08	**0.01**
37 Recycling	-0.27	**0.07**	0.08	**0.01**

Source: Author's calculations.

Appendix 2.4 Concentration and diversification of manufacturing industries in EAEU countries (%)

	2010	2011	2012	2013	2014	2015	2016	2017
AM								
15 Food and beverages	0.25	0.25	0.25	0.25	0.25	0.25	0.10	0.10
16 Tobacco products	0.00	0.00	0.01	0.01	0.02	0.02	0.01	0.01
17 Textiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18 Wearing apparel, fur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19 Leather, leather products and footwear	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 Wood products (excl. furniture)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21 Paper and paper products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22 Printing and publishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23 Coke, refined petroleum products, nuclear fuel	…	…	…	…	…	…	…	…
24 Chemicals and chemical products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25 Rubber and plastics products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26 Non-metallic mineral products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27 Basic metals	0.02	0.02	0.02	0.02	0.02	0.02	0.13	0.13
28 Fabricated metal products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29 Machinery and equipment n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30 Office, accounting and computing machinery (includes 32 and 33)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

31 Electrical machinery and apparatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	…	…	…	…	…	…	…	…
34 Motor vehicles, trailers, semi-trailers	…	…	…	…	…	…	…	…
35 Other transport equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36 Furniture; manufacturing n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37 Recycling	…	…	…	…	…	…	…	…
Concentration	**0.27**	**0.27**	**0.28**	**0.28**	**0.29**	**0.29**	**0.25**	**0.25**
Diversification	**0.73**	**0.73**	**0.72**	**0.72**	**0.71**	**0.71**	**0.75**	**0.75**
BY								
15 Food and beverages (includes 16)	0.05	0.02	0.03	0.05	0.05	0.04	0.07	0.07
16 Tobacco products	…	…	…	…	…	…	…	…
17 Textiles (includes 18)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18 Wearing apparel, fur	…	…	…	…	…	…	0.00	0.00
19 Leather, leather products and footwear	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 Wood products (excl. furniture)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21 Paper and paper products (includes 22)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22 Printing and publishing	…	…	…	…	…	…	0.00	0.00
23 Coke, refined petroleum products, nuclear fuel	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
24 Chemicals and chemical products	0.02	0.05	0.04	0.02	0.04	0.06	0.03	0.03

25 Rubber and plastics products	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
26 Non-metallic mineral products	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00
27 Basic metals (includes 28)	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
28 Fabricated metal products	…	…	…	…	…	…	0.00	0.00
29 Machinery and equipment n.e.c.	0.02	0.01	0.02	0.02	0.01	0.01	0.02	0.02
30 Office, accounting and computing machinery (includes 31, 32 and 33)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31 Electrical machinery and apparatus	…	…	…	…	…	0.00	0.00	0.00
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	…	…	…	…	…	…	…	…
34 Motor vehicles, trailers, semi-trailers (includes 35)	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
35 Other transport equipment	…	…	…	…	…	…	0.00	0.00
36 Furniture; manufacturing n.e.c. (includes 37)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37 Recycling	…	…	…	…	…	…	…	…
Concentration	**0.11**	**0.12**	**0.11**	**0.11**	**0.13**	**0.15**	**0.13**	**0.13**
Diversification	**0.89**	**0.88**	**0.89**	**0.89**	**0.87**	**0.85**	**0.87**	**0.87**
KZ								
15 Food and beverages	0.04	0.03	0.03	0.05	0.06	0.06	0.05	0.05
16 Tobacco products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

17 Textiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18 Wearing apparel, fur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19 Leather, leather products and footwear	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 Wood products (excl. furniture)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21 Paper and paper products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22 Printing and publishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23 Coke, refined petroleum products, nuclear fuel	0.02	0.02	0.02	0.03	0.02	0.01	0.01	0.01
24 Chemicals and chemical products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25 Rubber and plastics products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26 Non-metallic mineral products	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
27 Basic metals	0.13	0.15	0.13	0.08	0.09	0.12	0.15	0.15
28 Fabricated metal products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29 Machinery and equipment n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30 Office, accounting and computing machinery (includes 32 and 33)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31 Electrical machinery and apparatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	…	…	…	…	…	…	…	…
34 Motor vehicles, trailers, semi-trailers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

35 Other transport equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36 Furniture; manufacturing n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37 Recycling	…	…	…	…	…	…	…	…
Concentration	**0.20**	**0.21**	**0.20**	**0.17**	**0.18**	**0.20**	**0.22**	**0.22**
Diversification	**0.80**	**0.79**	**0.80**	**0.83**	**0.82**	**0.80**	**0.78**	**0.78**
KG								
15 Food and beverages	0.02	0.02	0.04	0.04	0.02	0.02	0.02	0.02
16 Tobacco products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17 Textiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18 Wearing apparel, fur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19 Leather, leather products and footwear	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 Wood products (excl. furniture)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21 Paper and paper products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22 Printing and publishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23 Coke ,refined petroleum products, nuclear fuel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24 Chemicals and chemical products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25 Rubber and plastics products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26 Non-metallic mineral products	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
27 Basic metals	0.46	0.47	0.24	0.24	0.36	0.40	0.46	0.46
28 Fabricated metal products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

29 Machinery and equipment n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30 Office, accounting and computing machinery (includes 32 and 33)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31 Electrical machinery and apparatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32 Radio, television and communication equipment	0.00	0.00	0.00	0.00	…	…	…	…
33 Medical, precision and optical instruments	0.00	0.00	0.00	0.00	…	…	…	…
34 Motor vehicles, trailers, semi-trailers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35 Other transport equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36 Furniture; manufacturing n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37 Recycling	0.00	0.00	0.00	…	…	…	…	…
Concentration	**0.48**	**0.49**	**0.29**	**0.29**	**0.40**	**0.43**	**0.48**	**0.48**
Diversification	**0.52**	**0.51**	**0.71**	**0.71**	**0.60**	**0.57**	**0.52**	**0.52**
RU								
15 Food and beverages	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
16 Tobacco products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17 Textiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18 Wearing apparel, fur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19 Leather, leather products and footwear	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 Wood products (excl. furniture)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21 Paper and paper products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22 Printing and publishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

23 Coke, refined petroleum products, nuclear fuel (excludes processing of nuclear fuel)	0.04	0.06	0.05	0.05	0.04	0.02	0.02	0.02
24 Chemicals and chemical products	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
25 Rubber and plastics products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26 Non-metallic mineral products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27 Basic metals	0.02	0.02	0.02	0.01	0.02	0.03	0.03	0.03
28 Fabricated metal products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29 Machinery and equipment n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30 Office, accounting and computing machinery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31 Electrical machinery and apparatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34 Motor vehicles, trailers, semi-trailers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35 Other transport equipment	0.00	…	0.00	0.00	0.00	0.00	0.00	…
36 Furniture; manufacturing n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37 Recycling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concentration	**0.10**	**0.12**	**0.11**	**0.11**	**0.10**	**0.10**	**0.10**	**0.11**
Diversification	**0.90**	**0.88**	**0.89**	**0.89**	**0.90**	**0.90**	**0.90**	**0.89**

Source: Author's calculations

Appendix 2.5 MVA structure by technological level of industry in EAEU countries (current prices, USD million)

	2010	2011	2012	2013	2014	2015	2016	2017
AM								
Low-tech	508	565	567	620	670	581	378	439
Medium low-tech	171	184	176	180	186	161	323	376
Medium high- and high-tech	24	39	38	39	40	35	34	39
BY								
Low-tech	4789	5043	4950	6390	6400	4646	3855	4499
Medium low-tech	3173	3813	4482	4331	4056	3547	1736	2026
Medium high- and high-tech	5304	7896	7190	6150	6404	4784	3734	4359
KZ								
Low-tech	4146	4922	5442	6690	6444	5311	4137	4784
Medium low-tech	10471	13665	14375	14326	12610	10945	9340	10799
Medium high- and high-tech	2143	2768	3233	4153	3793	2691	2076	2402
KG								
Low-tech	177	244	252	378	231	192	195	219
Medium low-tech	642	885	511	768	834	768	853	963
Medium high- and high-tech	30	43	55	83	46	28	29	33

RU								
Low-tech	53826	54905	62629	68022	59689	41679	39266	51247
Medium low-tech	83419	108842	116912	113372	103293	69958	61268	79966
Medium high- and high-tech	48929	54630	69200	64050	61208	49437	43194	54169
EAEU								
Low-tech	63446	65679	73840	82100	73434	52409	47831	61188
Medium low-tech	97876	127389	136456	132977	120979	85379	73520	94130
Medium high- and high-tech	56430	65376	79716	74475	71491	56975	49067	61002

Source: UNCTADstat Data Portal, author's calculations.

Appendix 3.

Appendix 3.1 Manufacturing employment in EAEU countries

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
AM								
15 Food and beverages	26900	19923	19450	19894	20412	20516	19506	22518
16 Tobacco products	3020	1650	1774	1936	2330	2746	3140	3625
17 Textiles	383	200	215	291	219	198	208	240
18 Wearing apparel, fur	3711	2871	2566	2639	2966	3023	3337	3852
19 Leather, leather products and footwear	363	352	328	375	419	345	392	453
20 Wood products (excl. furniture)	1035	1025	1017	1014	990	979	799	922

21 Paper and paper products	761	735	716	767	932	901	1037	1197
22 Printing and publishing	1210	1267	1325	1336	1157	1093	1095	1264
23 Coke, refined petroleum products, nuclear fuel	...	...	...	...	...	...	26 i	28
24 Chemicals and chemical products	7820	4834	4920	4566	4173	2154	1836	2120
25 Rubber and plastics products	1926	2179	2482	2392	2354	2564	2444	2821
26 Non-metallic mineral products	8067	5247	5315	5139	4630	4408	4081	4711
27 Basic metals	6081	3706	3726	3716	4371	4039	3556	4105
28 Fabricated metal products	2639	1078	1205	1229	1074	874	938	1083
29 Machinery and equipment n.e.c.	3016	1822	1803	1694	1575	1583	1451	1675
30 Office, accounting and computing machinery (includes 32 and 33)	...	1156	1168	1195	1085	1169	1137	1313
31 Electrical machinery and apparatus	1952	1511	1431	1382	1240	1117	1064	1228
32 Radio, television and communication equipment	...	...	...	...	...	...	...	...
33 Medical, precision and optical instruments	...	...	...	...	...	...	...	...
34 Motor vehicles, trailers, semi-trailers	...	...	...	...	...	...	...	...
35 Other transport equipment	...	7	6	6	7	9	33	38

36 Furniture; manufacturing n.e.c.	2581	1703	1675	1650	1730	1753	1834	2117
37 Recycling	...	...	...	...	...	...	...	...
D Total manufacturing	71500	51266	51122	51221	51664	49471	47888	55311
BY								
15 Food and beverages (includes 16)	151762	151961	150852	150502	149901	145427	141708	151486
16 Tobacco products	...	...	...	...	...	...	...	...
17 Textiles (includes 18)	104160	102549	100256	94861	87163	90437	27483	29379
18 Wearing apparel, fur	...	...	...	...	...	...	44011	47048
19 Leather, leather products and footwear	17138	17297	17123	16485	15938	14812	14035	15003
20 Wood products (excl. furniture)	48615	47904	46466	44524	42412	58236	38742	41415
21 Paper and paper products (includes 22)	32444	32217	31222	29975	27836	25870	12336	13187
22 Printing and publishing	...	...	...	...	...	...	6993	7476
23 Coke, refined petroleum products, nuclear fuel	9954	9977	10635	10936	10723	13007	12778	13660
24 Chemicals and chemical products	63243	63482	61599	60701	56880	56607	57925	61922
25 Rubber and plastics products	41375	42853	42888	42755	40364	92328	34672	37064
26 Non-metallic mineral products	72051	70681	66789	65511	62695	58267	50154	53615
27 Basic metals (includes 28)	72099	76790	77803	77035	74941	66234	17292	18485
28 Fabricated metal products	...	...	...	…	...	...	44099	47142

29 Machinery and equipment n.e.c.	145531	143648	149947	145286	132997	99503	114796	122717
30 Office, accounting and computing machinery (includes 31, 32 and 33)	72670	72069	69191	66048	61988	19212	19767	21131
31 Electrical machinery and apparatus	...	...	...	...	...	33736	33351	35652
32 Radio, television and communication equipment	...	...	...	...	...	...	...	...
33 Medical, precision and optical instruments	...	...	...	...	...	...	...	...
34 Motor vehicles, trailers, semi-trailers (includes 35)	65000	66106	58122	56680	52286	47559	38855	41536
35 Other transport equipment	...	...	...	...	...	...	5899	6306
36 Furniture; manufacturing n.e.c. (includes 37)	46559	46526	47449	47873	46294	66789	38554	41214
37 Recycling	...	...	...	…	...	...	...	...
D Total manufacturing	942601	944060	930342	909172	862418	789075	753450	805438
KZ								
15 Food and beverages	78980	79011	76531	76164	75999	67295	57637	59095
16 Tobacco products	1782	1826	1628	1563	1485	1379	1297	1330
17 Textiles	6532	7034	7612	6957	6908	6542	6586	6753
18 Wearing apparel, fur	5176	5014	5498	4577	5203	4729	5068	5196
19 Leather, leather products and footwear	1255	1237	1330	1335	1275	1098	1006	1031
20 Wood products (excl. furniture)	1383	1435	1172	1277	1179	669	491	503

21 Paper and paper products	2136	1780	1786	1892	2155	1872	1805	1851
22 Printing and publishing	2863	3431	3416	3330	2993	2116	1782	1827
23 Coke, refined petroleum products, nuclear fuel	8884	9392	9408	9607	9525	8723	8027	8230
24 Chemicals and chemical products	17536	22217	19188	20380	20317	19098	19218	19704
25 Rubber and plastics products	4518	5076	6098	6338	6462	4791	4411	4523
26 Non-metallic mineral products	36785	39761	39783	44737	44454	37128	30854	31634
27 Basic metals	129454	121282	93866	85989	79588	76926	77552	79513
28 Fabricated metal products	15370	15380	17536	17431	16030	14835	12250	12560
29 Machinery and equipment n.e.c.	72927	73679	73217	74623	73043	66797	58218	5969
30 Office, accounting and computing machinery (includes 32 and 33)	2717	1383	1761	1619	2026	1737	1622	1663
31 Electrical machinery and apparatus	4915	6526	7363	7325	7497	6303	5998	6150
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	…	…	…	…	…	…	…	…
34 Motor vehicles, trailers, semi-trailers	1133	1252	1351	1735	2407	1995	1846	1893
35 Other transport equipment	1745	3312	4193	4801	4825	5357	5019	5146

36 Furniture; manufacturing n.e.c.	3033	3471	3124	3514	3939	2939	2847	2919
37 Recycling	…	…	…	…	…	…	…	…
D Total manufacturing	399124	403499	375861	375194	367310	332329	303534	311211
KG								
15 Food and beverages	11462	11394	11639	11593	11147	11378	11248	12051
16 Tobacco products	521	490	264	241	191	87	65	70
17 Textiles	2765	2739	2270	1785	1544	983	839	899
18 Wearing apparel, fur	944	1005	852	811	975	866	988	1059
19 Leather, leather products and footwear	231	175	183	320	327	213	286	306
20 Wood products (excl. furniture)	622	568	476	488	195	171	133	142
21 Paper and paper products	679	709	734	685	711	620	622	666
22 Printing and publishing	2555	1885	1457	1349	1306	1286	1180	1264
23 Coke ,refined petroleum products, nuclear fuel	926	789	729	712	1141	1236	1294	1386
24 Chemicals and chemical products	1519	1382	1312	1308	1478	1418	1296	1389
25 Rubber and plastics products	1012	1356	903	1041	1061	1080	985	1055
26 Non-metallic mineral products	7218	7289	8356	9045	8711	8290	7677	8225
27 Basic metals	4758	4985	4944	4903	4638	4397	4381	4694
28 Fabricated metal products	1473	1448	1468	1486	2512	2504	2174	2329
29 Machinery and equipment n.e.c.	2625	2436	2129	1904	320	799	708	759

30 Office, accounting and computing machinery (includes 32 and 33)	16	5	11	18	17	49	73	78
31 Electrical machinery and apparatus	3570	3643	3416	3387	3170	3138	2968	3180
32 Radio, television and communication equipment	248	96	51	113	...	...	...	...
33 Medical, precision and optical instruments	255	268	259	264	...	...	...	...
34 Motor vehicles, trailers, semi-trailers	405	418	476	559	571	563	556	596
35 Other transport equipment	160	136	141	187	...	...	176	178
36 Furniture; manufacturing n.e.c.	1014	1155	1073	1255	1476	1364	1280	1371
37 Recycling	39	131	61	51	...	...	...	...
D Total manufacturing	45017	44513	43214	43505	41491	40442	38753	41698
RU								
15 Food and beverages	1306335	1282019	1244662	1207351	1181844	1177079	1166578	1249703
16 Tobacco products	11051	9766	9143	9068	8670	8294	7699	8248
17 Textiles	146698	130656	100993	102512	93595	91864	90250	96681
18 Wearing apparel, fur	186281	186155	184419	189832	179768	165803	156810	167984
19 Leather, leather products and footwear	57345	60700	53591	50187	47373	44392	43496	46595
20 Wood products (excl. furniture)	263824	257149	252507	245158	230062	220494	217645	233153
21 Paper and paper products	112448	112711	111518	108497	104648	102598	105128	112619
22 Printing and publishing	251816	245641	213766	210540	197023	187632	181534	194469

23 Coke, refined petroleum products, nuclear fuel (excludes processing of nuclear fuel)	108896	106514	108718	113425	118936	122048	123355	132145
24 Chemicals and chemical products	431411	415848	398182	390216	380616	383494	396295	424533
25 Rubber and plastics products	245159	250060	245974	247318	238542	233198	235863	252669
26 Non-metallic mineral products	561006	548615	552193	551028	599224	566899	524264	561621
27 Basic metals	507383	515771	510706	497746	494388	462672	449437	481462
28 Fabricated metal products	462483	482415	484353	493303	478548	463402	461502	494386
29 Machinery and equipment n.e.c.	839110	836898	818403	792718	754337	721155	685872	734744
30 Office, accounting and computing machinery	17254	19048	20106	20591	18870	18709	18805	20145
31 Electrical machinery and apparatus	316471	322845	315586	304942	297886	295753	291555	312330
32 Radio, television and communication equipment	...	...	...	...	...	...	...	...
33 Medical, precision and optical instruments	270588	274135	288517	296079	293636	299225	312738	335022
34 Motor vehicles, trailers, semi-trailers	348711	365291	368038	356757	336663	301897	278531	298378
35 Other transport equipment	218594	243440	250619	246553	227374	662266	659368	706351
36 Furniture; manufacturing n.e.c.	240814	216647	220255	217830	206383	198337	191329	204962
37 Recycling	51361	53731	51687	50256	49430	51202	50468	54064

D Total manufacturing	7810079	7774433	7622555	7531002	7309608	7159207	7032513	7122264
EAEU	9268321	9217771	9023094	8910094	8632491	8370524	8176138	8335922

Source: UNCTADstat Data Portal.

Appendix 3.2 Share of manufacturing employment in individual industries in EAEU countries (%)

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
AM								
15 Food and beverages	37.62	38.86	38.05	38.84	39.51	41.47	40.73	40.71
16 Tobacco products	4.22	3.22	3.47	3.78	4.51	5.55	6.56	6.55
17 Textiles	0.54	0.39	0.42	0.57	0.42	0.40	0.43	0.43
18 Wearing apparel, fur	5.19	5.60	5.02	5.15	5.74	6.11	6.97	6.96
19 Leather, leather products and footwear	0.51	0.69	0.64	0.73	0.81	0.70	0.82	0.82
20 Wood products (excl. furniture)	1.45	2.00	1.99	1.98	1.92	1.98	1.67	1.67
21 Paper and paper products	1.06	1.43	1.40	1.50	1.80	1.82	2.17	2.16
22 Printing and publishing	1.69	2.47	2.59	2.61	2.24	2.21	2.29	2.29
23 Coke, refined petroleum products, nuclear fuel	…	…	…	…	…	…	0.05	0.05
24 Chemicals and chemical products	10.94	9.43	9.62	8.91	8.08	4.35	3.83	3.83
25 Rubber and plastics products	2.69	4.25	4.86	4.67	4.56	5.18	5.10	5.10
26 Non-metallic mineral products	11.28	10.23	10.40	10.03	8.96	8.91	8.52	8.52
27 Basic metals	8.50	7.23	7.29	7.25	8.46	8.16	7.43	7.42

28 Fabricated metal products	3.69	2.10	2.36	2.40	2.08	1.77	1.96	1.96
29 Machinery and equipment n.e.c.	4.22	3.55	3.53	3.31	3.05	3.20	3.03	3.03
30 Office, accounting and computing machinery (includes 32 and 33)	…	2.25	2.28	2.33	2.10	2.36	2.37	2.37
31 Electrical machinery and apparatus	2.73	2.95	2.80	2.70	2.40	2.26	2.22	2.22
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	…	…	…	…	…	…	…	…
34 Motor vehicles, trailers, semi-trailers	…	…	…	…	…	…	…	…
35 Other transport equipment	…	0.01	0.01	0.01	0.01	0.02	0.07	0.07
36 Furniture; manufacturing n.e.c.	3.61	3.32	3.28	3.22	3.35	3.54	3.83	3.83
37 Recycling	…	…	…	…	…	…	…	…
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.05	100.00
BY								
15 Food and beverages (includes 16)	16.10	16.10	16.21	16.55	17.38	18.43	18.81	18.81
16 Tobacco products	…	…	…	…	…	…	…	…
17 Textiles (includes 18)	11.05	10.86	10.78	10.43	10.11	11.46	3.65	3.65
18 Wearing apparel, fur	…	…	…	…	…	…	5.84	5.84
19 Leather, leather products and footwear	1.82	1.83	1.84	1.81	1.85	1.88	1.86	1.86

20 Wood products (excl. furniture)	5.16	5.07	4.99	4.90	4.92	7.38	5.14	5.14
21 Paper and paper products (includes 22)	3.44	3.41	3.36	3.30	3.23	3.28	1.64	1.64
22 Printing and publishing	…	…	…	…	…	…	0.93	0.93
23 Coke, refined petroleum products, nuclear fuel	1.06	1.06	1.14	1.20	1.24	1.65	1.70	1.70
24 Chemicals and chemical products	6.71	6.72	6.62	6.68	6.60	7.17	7.69	7.69
25 Rubber and plastics products	4.39	4.54	4.61	4.70	4.68	11.70	4.60	4.60
26 Non-metallic mineral products	7.64	7.49	7.18	7.21	7.27	7.38	6.66	6.66
27 Basic metals (includes 28)	7.65	8.13	8.36	8.47	8.69	8.39	2.30	2.30
28 Fabricated metal products	…	…	…	…	…	…	5.85	5.85
29 Machinery and equipment n.e.c.	15.44	15.22	16.12	15.98	15.42	12.61	15.24	15.24
30 Office, accounting and computing machinery (includes 31, 32 and 33)	7.71	7.63	7.44	7.26	7.19	2.43	2.62	2.62
31 Electrical machinery and apparatus	…	…	…	…	…	4.28	4.43	4.43
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	…	…	…	…	…	…	…	…

34 Motor vehicles, trailers, semi-trailers (includes 35)	6.90	7.00	6.25	6.23	6.06	6.03	5.16	5.16
35 Other transport equipment	…	…	…	…	…	…	0.78	0.78
36 Furniture; manufacturing n.e.c. (includes 37)	4.94	4.93	5.10	5.27	5.37	8.46	5.12	5.12
37 Recycling	…	…	…	…	…	…	…	…
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
KZ								
15 Food and beverages	19.79	19.58	20.36	20.30	20.69	20.25	18.99	18.99
16 Tobacco products	0.45	0.45	0.43	0.42	0.40	0.41	0.43	0.43
17 Textiles	1.64	1.74	2.03	1.85	1.88	1.97	2.17	2.17
18 Wearing apparel, fur	1.30	1.24	1.46	1.22	1.42	1.42	1.67	1.67
19 Leather, leather products and footwear	0.31	0.31	0.35	0.36	0.35	0.33	0.33	0.33
20 Wood products (excl. furniture)	0.35	0.36	0.31	0.34	0.32	0.20	0.16	0.16
21 Paper and paper products	0.54	0.44	0.48	0.50	0.59	0.56	0.59	0.59
22 Printing and publishing	0.72	0.85	0.91	0.89	0.81	0.64	0.59	0.59
23 Coke, refined petroleum products, nuclear fuel	2.23	2.33	2.50	2.56	2.59	2.62	2.64	2.64
24 Chemicals and chemical products	4.39	5.51	5.11	5.43	5.53	5.75	6.33	6.33
25 Rubber and plastics products	1.13	1.26	1.62	1.69	1.76	1.44	1.45	1.45
26 Non-metallic mineral products	9.22	9.85	10.58	11.92	12.10	11.17	10.16	10.16

27 Basic metals	32.43	30.06	24.97	22.92	21.67	23.15	25.55	25.55
28 Fabricated metal products	3.85	3.81	4.67	4.65	4.36	4.46	4.04	4.04
29 Machinery and equipment n.e.c.	18.27	18.26	19.48	19.89	19.89	20.10	19.18	19.18
30 Office, accounting and computing machinery (includes 32 and 33)	0.68	0.34	0.47	0.43	0.55	0.52	0.53	0.53
31 Electrical machinery and apparatus	1.23	1.62	1.96	1.95	2.04	1.90	1.98	1.98
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	…	…	…	…	…	…	…	…
34 Motor vehicles, trailers, semi-trailers	0.28	0.31	0.36	0.46	0.66	0.60	0.61	0.61
35 Other transport equipment	0.44	0.82	1.12	1.28	1.31	1.61	1.65	1.65
36 Furniture; manufacturing n.e.c.	0.76	0.86	0.83	0.94	1.07	0.88	0.94	0.94
37 Recycling	…	…	…	…	…	…	…	…
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
KG								
15 Food and beverages	25.46	25.60	26.93	26.65	26.87	28.13	29.02	28.90
16 Tobacco products	1.16	1.10	0.61	0.55	0.46	0.22	0.17	0.17
17 Textiles	6.14	6.15	5.25	4.10	3.72	2.43	2.16	2.16
18 Wearing apparel, fur	2.10	2.26	1.97	1.86	2.35	2.14	2.55	2.54
19 Leather, leather products and footwear	0.51	0.39	0.42	0.74	0.79	0.53	0.74	0.73

20 Wood products (excl. furniture)	1.38	1.28	1.10	1.12	0.47	0.42	0.34	0.34
21 Paper and paper products	1.51	1.59	1.70	1.57	1.71	1.53	1.61	1.60
22 Printing and publishing	5.68	4.23	3.37	3.10	3.15	3.18	3.04	3.03
23 Coke ,refined petroleum products, nuclear fuel	2.06	1.77	1.69	1.64	2.75	3.06	3.34	3.32
24 Chemicals and chemical products	3.37	3.10	3.04	3.01	3.56	3.51	3.34	3.33
25 Rubber and plastics products	2.25	3.05	2.09	2.39	2.56	2.67	2.54	2.53
26 Non-metallic mineral products	16.03	16.37	19.34	20.79	20.99	20.50	19.81	19.73
27 Basic metals	10.57	11.20	11.44	11.27	11.18	10.87	11.30	11.26
28 Fabricated metal products	3.27	3.25	3.40	3.42	6.05	6.19	5.61	5.59
29 Machinery and equipment n.e.c.	5.83	5.47	4.93	4.38	0.77	1.98	1.83	1.82
30 Office, accounting and computing machinery (includes 32 and 33)	0.04	0.01	0.03	0.04	0.04	0.12	0.19	0.19
31 Electrical machinery and apparatus	7.93	8.18	7.90	7.79	7.64	7.76	7.66	7.63
32 Radio, television and communication equipment	0.55	0.22	0.12	0.26	…	…	…	…
33 Medical, precision and optical instruments	0.57	0.60	0.60	0.61	…	…	…	…
34 Motor vehicles, trailers, semi-trailers	0.90	0.94	1.10	1.28	1.38	1.39	1.43	1.43

35 Other transport equipment	0.36	0.31	0.33	0.43	…	…	0.45	0.43
36 Furniture; manufacturing n.e.c.	2.25	2.59	2.48	2.88	3.56	3.37	3.30	3.29
37 Recycling	0.09	0.29	0.14	0.12	…	…	…	…
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
RU								
15 Food and beverages	16.73	16.49	16.33	16.03	16.17	16.44	16.59	17.55
16 Tobacco products	0.14	0.13	0.12	0.12	0.12	0.12	0.11	0.12
17 Textiles	1.88	1.68	1.32	1.36	1.28	1.28	1.28	1.36
18 Wearing apparel, fur	2.39	2.39	2.42	2.52	2.46	2.32	2.23	2.36
19 Leather, leather products and footwear	0.73	0.78	0.70	0.67	0.65	0.62	0.62	0.65
20 Wood products (excl. furniture)	3.38	3.31	3.31	3.26	3.15	3.08	3.09	3.27
21 Paper and paper products	1.44	1.45	1.46	1.44	1.43	1.43	1.49	1.58
22 Printing and publishing	3.22	3.16	2.80	2.80	2.70	2.62	2.58	2.73
23 Coke, refined petroleum products, nuclear fuel (excludes processing of nuclear fuel)	1.39	1.37	1.43	1.51	1.63	1.70	1.75	1.86
24 Chemicals and chemical products	5.52	5.35	5.22	5.18	5.21	5.36	5.64	5.96
25 Rubber and plastics products	3.14	3.22	3.23	3.28	3.26	3.26	3.35	3.55
26 Non-metallic mineral products	7.18	7.06	7.24	7.32	8.20	7.92	7.45	7.89
27 Basic metals	6.50	6.63	6.70	6.61	6.76	6.46	6.39	6.76

28 Fabricated metal products	5.92	6.21	6.35	6.55	6.55	6.47	6.56	6.94
29 Machinery and equipment n.e.c.	10.74	10.76	10.74	10.53	10.32	10.07	9.75	10.32
30 Office, accounting and computing machinery	0.22	0.25	0.26	0.27	0.26	0.26	0.27	0.28
31 Electrical machinery and apparatus	4.05	4.15	4.14	4.05	4.08	4.13	4.15	4.39
32 Radio, television and communication equipment	…	…	…	…	…	…	…	…
33 Medical, precision and optical instruments	3.46	3.53	3.79	3.93	4.02	4.18	4.45	4.70
34 Motor vehicles, trailers, semi-trailers	4.46	4.70	4.83	4.74	4.61	4.22	3.96	4.19
35 Other transport equipment	2.80	3.13	3.29	3.27	3.11	9.25	9.38	9.92
36 Furniture; manufacturing n.e.c.	3.08	2.79	2.89	2.89	2.82	2.77	2.72	2.88
37 Recycling	0.66	0.69	0.68	0.67	0.68	0.72	0.72	0.76
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: UNCTADstat Data Portal, author's calculations

Appendix 4.

Appendix 4.1 Manufacturing exports in EAEU countries (current prices, 1000 USD)

	2010	2011	2012	2013	2014	2015	2016	2017
AM								
15 Food and beverages	132591	179927	223834	254607	237964	172297	236084	324738
16 Tobacco products	8307	16320	41861	68535	115882	170624	211554	237401
17 Textiles	1305	1064	815	983	608	17446	11834	17643
18 Wearing apparel, fur	4884	7036	17875	37654	49328	66641	85064	113015
19 Leather, leather products and footwear	2771	3431	3559	4391	4263	3588	8525	6354
20 Wood products (excl. furniture)	723	616	821	724	753	1261	1478	2319
21 Paper and paper products	322	433	300	420	1650	1375	559	875
22 Printing and publishing	313	253	550	441	237	329	891	224
23 Coke, refined petroleum products, nuclear fuel	483	85	1	123	263	200	7	166
24 Chemicals and chemical products	19590	13654	15837	18564	16043	18564	19842	30949
25 Rubber and plastics products	4883	6123	8855	9174	8921	7870	7602	6901
26 Non-metallic mineral products	18491	23163	27280	37398	26085	12118	15703	16020
27 Basic metals	336236	406778	390649	366686	374109	316797	354204	417875
28 Fabricated metal products	3537	2930	5294	5712	4807	4777	6551	4796

29 Machinery and equipment n.e.c.	16666	13208	12844	11069	12134	9221	17186	25930
30 Office, accounting and computing machinery (includes 32 and 33)	249	395	9530	596	863	840	649	896
31 Electrical machinery and apparatus	5587	5767	6796	7445	7327	3491	5210	44005
32 Radio, television and communication equipment	7350	9261	8412	1725	2979	1358	2596	3204
33 Medical, precision and optical instruments	7144	14091	18778	19542	22307	26710	32124	22111
34 Motor vehicles, trailers, semi-trailers	1096	2592	2499	544	905	8209	13069	13622
35 Other transport equipment	1588	26226	53923	23883	2302	1350	181	427
36 Furniture; manufacturing n.e.c.	85753	88660	87450	108313	134408	95092	192624	90304
37 Recycling	0	0	0	0	0	0	0	0
D Total manufacturing	659869	822013	937763	978529	1024138	940158	1223537	1379775
BY								
15 Food and beverages (includes 16)	3035470	3557310	4148112	4780734	4510830	3452956	3521996	4178008
16 Tobacco products	2098	4534	12349	51063	88322	39855	0	0
17 Textiles (includes 18)	555920	680296	681306	708112	641062	515668	638292	691147
18 Wearing apparel, fur	329005	393800	450242	436873	413746	236550	263477	299058

19 Leather, leather products and footwear	80227	98414	115844	133424	136712	99126	109869	129270
20 Wood products (excl. furniture)	314280	411411	460535	574804	668595	593825	739034	1040511
21 Paper and paper products (includes 22)	175847	227178	202955	181469	181968	136122	139679	165629
22 Printing and publishing	58666	38168	42092	48864	46824	29565	31707	37052
23 Coke, refined petroleum products, nuclear fuel	6922441	13071594	0	0	0	7056681	4246390	5734809
24 Chemicals and chemical products	3911369	7312710	8436430	4183029	5081826	4842131	3783431	4423271
25 Rubber and plastics products	987369	1256345	1425049	1412329	1160009	823893	885829	964545
26 Non-metallic mineral products	431376	548126	684075	790891	1172688	461258	547236	1005620
27 Basic metals (includes 28)	1183055	1540421	1573209	1392014	1434903	1069507	901213	1222464
28 Fabricated metal products	575790	745646	781885	831644	804494	587125	645199	759514
29 Machinery and equipment n.e.c.	2202782	2907148	3171459	3178679	2415776	1772210	2164386	2775407
30 Office, accounting and computing machinery (includes 31, 32 and 33)	30703	14197	17754	30464	52087	24961	23466	34574
31 Electrical machinery and apparatus	546620	713105	705000	650523	584538	438738	485935	572613
32 Radio, television and communication equipment	95503	144415	274331	221146	159665	119286	126276	174970

33 Medical, precision and optical instruments	245985	302650	338127	399465	376759	302575	325921	340354
34 Motor vehicles, trailers, semi-trailers (includes 35)	1588548	2706150	2942634	2090877	1796572	941972	1071912	1120693
35 Other transport equipment	20653	45678	97650	121284	82144	85767	137666	244545
36 Furniture; manufacturing n.e.c. (includes 37)	424160	517672	581016	622398	608048	422202	436256	576799
37 Recycling	3570	4278	4298	4024	4263	4906	6959	8203
D Total manufacturing	23721437	37241246	27146352	22844110	22421831	24056879	21232129	26499055
KZ								
15 Food and beverages	882925	956051	1068827	1077424	1099350	940947	924161	1028141
16 Tobacco products	34388	44770	79426	93275	100492	108369	110964	92111
17 Textiles	27341	37154	30720	49541	24157	31477	37657	106249
18 Wearing apparel, fur	1616	27214	16624	23647	25978	28074	34724	11977
19 Leather, leather products and footwear	55430	71664	72110	74860	46132	105431	129680	25831
20 Wood products (excl. furniture)	1573	1897	18893	5743	5332	1678	8069	24019
21 Paper and paper products	25525	27868	33241	33896	33028	23155	20738	33355
22 Printing and publishing	1995	59280	472098	78104	4738	5690	222914	5508
23 Coke, refined petroleum products, nuclear fuel	4764441	6042259	7479440	6989426	6518176	4390226	3060640	3384026

24 Chemicals and chemical products	635008	1082208	1054517	1033250	1039424	969562	830615	976025
25 Rubber and plastics products	34421	63238	72035	72986	67254	51318	59085	70708
26 Non-metallic mineral products	102757	110609	68658	72129	83475	31970	46945	74475
27 Basic metals	8095405	12761501	13544547	8462203	7272258	6547585	6530422	9197507
28 Fabricated metal products	53220	95402	85030	151845	118398	93275	95925	83513
29 Machinery and equipment n.e.c.	136399	268815	303264	363534	461221	155037	229378	230401
30 Office, accounting and computing machinery (includes 32 and 33)	8855	95907	300977	202737	402932	26151	12656	12930
31 Electrical machinery and apparatus	37799	91873	112967	124653	101892	98463	128377	120862
32 Radio, television and communication equipment	22926	34782	122946	92790	278618	62538	48903	48579
33 Medical, precision and optical instruments	26018	43516	43388	40094	29601	32698	24756	33555
34 Motor vehicles, trailers, semi-trailers	30103	41644	34674	93136	40348	63979	137391	53640
35 Other transport equipment	110944	183346	409324	363587	578634	180792	118248	144289
36 Furniture; manufacturing n.e.c.	3550	34433	11978	12336	29344	51794	56255	54369
37 Recycling	3	291	94	3	26	29	81	31
D Total manufacturing	15092642	22175722	25435778	19511199	18360808	14000238	12868584	15812102

KG								
15 Food and beverages	50671	51914	47534	42755	…	44202	57460	86044
16 Tobacco products	2559	2547	1369	4734	…	16983	13125	22581
17 Textiles	14000	23008	10272	7929	…	13643	6499	13183
18 Wearing apparel, fur	0	0	135737	92019	…	39127	67543	112324
19 Leather, leather products and footwear	2057	0	0	0	…	29619	14187	41207
20 Wood products (excl. furniture)	108	142	354	646	…	106	96	387
21 Paper and paper products	5728	9136	9230	8732	…	4714	3401	4302
22 Printing and publishing	477	280	20	172	…	246	196	475
23 Coke ,refined petroleum products, nuclear fuel	0	0	0	0	…	69108	38796	46978
24 Chemicals and chemical products	5492	6671	8840	6471	…	11941	14977	19317
25 Rubber and plastics products	8070	10810	11597	17618	…	23723	11320	17401
26 Non-metallic mineral products	11033	15633	35980	55404	…	22519	30152	47294
27 Basic metals	677152	1018422	567217	741297	…	676891	723930	790472
28 Fabricated metal products	1841	5316	2104	7619	…	9823	5273	9690
29 Machinery and equipment n.e.c.	12	881	937	655	…	56910	60020	64249
30 Office, accounting and computing machinery (includes 32 and 33)	0	0	0	0	…	348	3966	476

31 Electrical machinery and apparatus	1148	3312	3806	5720	…	30898	17688	14395
32 Radio, television and communication equipment	56	0	507	541	…	856	1416	2019
33 Medical, precision and optical instruments	268	211	205	89	…	5390	13757	5853
34 Motor vehicles, trailers, semi-trailers	14960	0	0	0	…	47716	23432	47633
35 Other transport equipment	6	0	0	0	…	49841	48193	82272
36 Furniture; manufacturing n.e.c.	2230	2163	2897	3925	…	3515	2620	3929
37 Recycling	4	9	0	0	…	0	0	0
D Total manufacturing	797872	1150455	838606	996326	…	1158119	1158047	1432482
RU								
15 Food and beverages	4666410	6020617	8997188	10007393	10293731	8702577	9451485	11258018
16 Tobacco products	327223	412718	659696	703678	778717	743008	656629	587001
17 Textiles	215987	247949	397665	446776	468788	396397	413024	491003
18 Wearing apparel, fur	82620	122354	292501	385178	349503	276009	259539	335805
19 Leather, leather products and footwear	225414	259533	357156	418064	512534	361234	363497	382643
20 Wood products (excl. furniture)	4237489	4971705	5183778	5677757	5974742	4961536	5155309	6419557
21 Paper and paper products	2565769	3027932	3174855	3255904	3591283	3129466	3132570	3776608
22 Printing and publishing	287291	283962	299133	500937	471162	554634	302537	519202

23 Coke, refined petroleum products, nuclear fuel (excludes processing of nuclear fuel)	72700287	95407274	107980466	113956772	120395940	70725145	48974907	61906605
24 Chemicals and chemical products	17883187	24548779	26845255	25464863	24835810	20878072	16817054	21269272
25 Rubber and plastics products	1042709	1354140	2107735	2415879	2277128	1983105	2149670	1524511
26 Non-metallic mineral products	795808	838398	1590637	1741312	1620377	1433763	1617463	1854867
27 Basic metals	36644774	40303953	49106053	45064362	41286206	33172838	30189293	41718787
28 Fabricated metal products	952553	1410581	2057661	2163065	2031415	1899790	1893311	2279872
29 Machinery and equipment n.e.c.	2600640	2801229	4538210	4977874	4279844	5274142	3541330	4737806
30 Office, accounting and computing machinery	135905	252555	312434	441589	1862040	0	298570	355856
31 Electrical machinery and apparatus	1334388	1589798	2464782	2600957	2390100	1873078	1884044	2139212
32 Radio, television and communication equipment	715138	948839	1254238	1702440	2017980	1007704	1115735	1359485
33 Medical, precision and optical instruments	1234738	1478004	1703668	1573693	1415278	1435832	1968513	2670320
34 Motor vehicles, trailers, semi-trailers	1321171	1883395	3194763	3914416	3475427	2822113	2741393	3575215
35 Other transport equipment	3119354	2559407	5161133	5979501	4546986	5595357	2741595	5712047
36 Furniture; manufacturing n.e.c.	561779	413641	2729369	3237051	3468628	1826181	1211927	1278076

37 Recycling	543	933	512	694	459	569	582	876
D Total manufacturing	153651177	191137696	230408888	236630155	238344078	169052550	136879977	176152643
EAEU	193922997	252527132	284767387	280960319	280150855	209207944	173362274	221276056

Source: UNCTADstat Data Portal, author's calculations

Appendix 4.2 Contribution of individual industries to manufacturing exports of EAEU countries (%)

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
AM								
15 Food and beverages	20.09	21.89	23.87	26.02	23.24	18.33	19.30	23.54
16 Tobacco products	1.26	1.99	4.46	7.00	11.32	18.15	17.29	17.21
17 Textiles	0.20	0.13	0.09	0.10	0.06	1.86	0.97	1.28
18 Wearing apparel, fur	0.74	0.86	1.91	3.85	4.82	7.09	6.95	8.19
19 Leather, leather products and footwear	0.42	0.42	0.38	0.45	0.42	0.38	0.70	0.46
20 Wood products (excl. furniture)	0.11	0.07	0.09	0.07	0.07	0.13	0.12	0.17
21 Paper and paper products	0.05	0.05	0.03	0.04	0.16	0.15	0.05	0.06
22 Printing and publishing	0.05	0.03	0.06	0.05	0.02	0.03	0.07	0.02
23 Coke, refined petroleum products, nuclear fuel	0.07	0.01	0.00	0.01	0.03	0.02	0.00	0.01
24 Chemicals and chemical products	2.97	1.66	1.69	1.90	1.57	1.97	1.62	2.24
25 Rubber and plastics products	0.74	0.74	0.94	0.94	0.87	0.84	0.62	0.50

26 Non-metallic mineral products	2.80	2.82	2.91	3.82	2.55	1.29	1.28	1.16
27 Basic metals	50.95	49.49	41.66	37.47	36.53	33.70	28.95	30.29
28 Fabricated metal products	0.54	0.36	0.56	0.58	0.47	0.51	0.54	0.35
29 Machinery and equipment n.e.c.	2.53	1.61	1.37	1.13	1.18	0.98	1.40	1.88
30 Office, accounting and computing machinery (includes 32 and 33)	0.04	0.05	1.02	0.06	0.08	0.09	0.05	0.06
31 Electrical machinery and apparatus	0.85	0.70	0.72	0.76	0.72	0.37	0.43	3.19
32 Radio, television and communication equipment	1.11	1.13	0.90	0.18	0.29	0.14	0.21	0.23
33 Medical, precision and optical instruments	1.08	1.71	2.00	2.00	2.18	2.84	2.63	1.60
34 Motor vehicles, trailers, semi-trailers	0.17	0.32	0.27	0.06	0.09	0.87	1.07	0.99
35 Other transport equipment	0.24	3.19	5.75	2.44	0.22	0.14	0.01	0.03
36 Furniture; manufacturing n.e.c.	13.00	10.79	9.33	11.07	13.12	10.11	15.74	6.54
37 Recycling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
BY								

15 Food and beverages (includes 16)	12.80	9.55	15.28	20.93	20.12	14.35	16.59	15.77
16 Tobacco products	0.01	0.01	0.05	0.22	0.39	0.17	0.00	0.00
17 Textiles (includes 18)	2.34	1.83	2.51	3.10	2.86	2.14	3.01	2.61
18 Wearing apparel, fur	1.39	1.06	1.66	1.91	1.85	0.98	1.24	1.13
19 Leather, leather products and footwear	0.34	0.26	0.43	0.58	0.61	0.41	0.52	0.49
20 Wood products (excl. furniture)	1.32	1.10	1.70	2.52	2.98	2.47	3.48	3.93
21 Paper and paper products (includes 22)	0.74	0.61	0.75	0.79	0.81	0.57	0.66	0.63
22 Printing and publishing	0.25	0.10	0.16	0.21	0.21	0.12	0.15	0.14
23 Coke, refined petroleum products, nuclear fuel	29.18	35.10	0.00	0.00	0.00	29.33	20.00	21.64
24 Chemicals and chemical products	16.49	19.64	31.08	18.31	22.66	20.13	17.82	16.69
25 Rubber and plastics products	4.16	3.37	5.25	6.18	5.17	3.42	4.17	3.64
26 Non-metallic mineral products	1.82	1.47	2.52	3.46	5.23	1.92	2.58	3.79
27 Basic metals (includes 28)	4.99	4.14	5.80	6.09	6.40	4.45	4.24	4.61
28 Fabricated metal products	2.43	2.00	2.88	3.64	3.59	2.44	3.04	2.87
29 Machinery and equipment n.e.c.	9.29	7.81	11.68	13.91	10.77	7.37	10.19	10.47

30 Office, accounting and computing machinery (includes 31, 32 and 33)	0.13	0.04	0.07	0.13	0.23	0.10	0.11	0.13
31 Electrical machinery and apparatus	2.30	1.91	2.60	2.85	2.61	1.82	2.29	2.16
32 Radio, television and communication equipment	0.40	0.39	1.01	0.97	0.71	0.50	0.59	0.66
33 Medical, precision and optical instruments	1.04	0.81	1.25	1.75	1.68	1.26	1.54	1.28
34 Motor vehicles, trailers, semi-trailers (includes 35)	6.70	7.27	10.84	9.15	8.01	3.92	5.05	4.23
35 Other transport equipment	0.09	0.12	0.36	0.53	0.37	0.36	0.65	0.92
36 Furniture; manufacturing n.e.c. (includes 37)	1.79	1.39	2.14	2.72	2.71	1.76	2.05	2.18
37 Recycling	0.02	0.01	0.02	0.02	0.02	0.02	0.03	0.03
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
KZ								
15 Food and beverages	5.85	4.31	4.20	5.52	5.99	6.72	7.18	6.50
16 Tobacco products	0.23	0.20	0.31	0.48	0.55	0.77	0.86	0.58
17 Textiles	0.18	0.17	0.12	0.25	0.13	0.22	0.29	0.67
18 Wearing apparel, fur	0.01	0.12	0.07	0.12	0.14	0.20	0.27	0.08

19 Leather, leather products and footwear	0.37	0.32	0.28	0.38	0.25	0.75	1.01	0.16
20 Wood products (excl. furniture)	0.01	0.01	0.07	0.03	0.03	0.01	0.06	0.15
21 Paper and paper products	0.17	0.13	0.13	0.17	0.18	0.17	0.16	0.21
22 Printing and publishing	0.01	0.27	1.86	0.40	0.03	0.04	1.73	0.03
23 Coke, refined petroleum products, nuclear fuel	31.57	27.25	29.41	35.82	35.50	31.36	23.78	21.40
24 Chemicals and chemical products	4.21	4.88	4.15	5.30	5.66	6.93	6.45	6.17
25 Rubber and plastics products	0.23	0.29	0.28	0.37	0.37	0.37	0.46	0.45
26 Non-metallic mineral products	0.68	0.50	0.27	0.37	0.45	0.23	0.36	0.47
27 Basic metals	53.64	57.55	53.25	43.37	39.61	46.77	50.75	58.17
28 Fabricated metal products	0.35	0.43	0.33	0.78	0.64	0.67	0.75	0.53
29 Machinery and equipment n.e.c.	0.90	1.21	1.19	1.86	2.51	1.11	1.78	1.46
30 Office, accounting and computing machinery (includes 32 and 33)	0.06	0.43	1.18	1.04	2.19	0.19	0.10	0.08
31 Electrical machinery and apparatus	0.25	0.41	0.44	0.64	0.55	0.70	1.00	0.76
32 Radio, television and communication equipment	0.15	0.16	0.48	0.48	1.52	0.45	0.38	0.31

33 Medical, precision and optical instruments	0.17	0.20	0.17	0.21	0.16	0.23	0.19	0.21
34 Motor vehicles, trailers, semi-trailers	0.20	0.19	0.14	0.48	0.22	0.46	1.07	0.34
35 Other transport equipment	0.74	0.83	1.61	1.86	3.15	1.29	0.92	0.91
36 Furniture; manufacturing n.e.c.	0.02	0.16	0.05	0.06	0.16	0.37	0.44	0.34
37 Recycling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
KG								
15 Food and beverages	6.35	4.51	5.67	4.29	…	3.82	4.96	6.01
16 Tobacco products	0.32	0.22	0.16	0.48	…	1.47	1.13	1.58
17 Textiles	1.75	2.00	1.22	0.80	…	1.18	0.56	0.92
18 Wearing apparel, fur	0.00	0.00	16.19	9.24	…	3.38	5.83	7.84
19 Leather, leather products and footwear	0.26	0.00	0.00	0.00	…	2.56	1.23	2.88
20 Wood products (excl. furniture)	0.01	0.01	0.04	0.06	…	0.01	0.01	0.03
21 Paper and paper products	0.72	0.79	1.10	0.88	…	0.41	0.29	0.30
22 Printing and publishing	0.06	0.02	0.00	0.02	…	0.02	0.02	0.03
23 Coke ,refined petroleum products, nuclear fuel	0.00	0.00	0.00	0.00	…	5.97	3.35	3.28
24 Chemicals and chemical products	0.69	0.58	1.05	0.65	…	1.03	1.29	1.35

25 Rubber and plastics products	1.01	0.94	1.38	1.77	…	2.05	0.98	1.21
26 Non-metallic mineral products	1.38	1.36	4.29	5.56	…	1.94	2.60	3.30
27 Basic metals	84.87	88.52	67.64	74.40	…	58.45	62.51	55.18
28 Fabricated metal products	0.23	0.46	0.25	0.76	…	0.85	0.46	0.68
29 Machinery and equipment n.e.c.	0.00	0.08	0.11	0.07	…	4.91	5.18	4.49
30 Office, accounting and computing machinery (includes 32 and 33)	0.00	0.00	0.00	0.00	…	0.03	0.34	0.03
31 Electrical machinery and apparatus	0.14	0.29	0.45	0.57	…	2.67	1.53	1.00
32 Radio, television and communication equipment	0.01	0.00	0.06	0.05	…	0.07	0.12	0.14
33 Medical, precision and optical instruments	0.03	0.02	0.02	0.01	…	0.47	1.19	0.41
34 Motor vehicles, trailers, semi-trailers	1.87	0.00	0.00	0.00	…	4.12	2.02	3.33
35 Other transport equipment	0.00	0.00	0.00	0.00	…	4.30	4.16	5.74
36 Furniture; manufacturing n.e.c.	0.28	0.19	0.35	0.39	…	0.30	0.23	0.27
37 Recycling	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
D Total manufacturing	100.00	100.00	100.00	100.00	…	100.00	100.00	100.00
RU								

15 Food and beverages	3.04	3.15	3.90	4.23	4.32	5.15	6.90	6.39
16 Tobacco products	0.21	0.22	0.29	0.30	0.33	0.44	0.48	0.33
17 Textiles	0.14	0.13	0.17	0.19	0.20	0.23	0.30	0.28
18 Wearing apparel, fur	0.05	0.06	0.13	0.16	0.15	0.16	0.19	0.19
19 Leather, leather products and footwear	0.15	0.14	0.16	0.18	0.22	0.21	0.27	0.22
20 Wood products (excl. furniture)	2.76	2.60	2.25	2.40	2.51	2.93	3.77	3.64
21 Paper and paper products	1.67	1.58	1.38	1.38	1.51	1.85	2.29	2.14
22 Printing and publishing	0.19	0.15	0.13	0.21	0.20	0.33	0.22	0.29
23 Coke, refined petroleum products, nuclear fuel (excludes processing of nuclear fuel)	47.32	49.92	46.86	48.16	50.51	41.84	35.78	35.14
24 Chemicals and chemical products	11.64	12.84	11.65	10.76	10.42	12.35	12.29	12.07
25 Rubber and plastics products	0.68	0.71	0.91	1.02	0.96	1.17	1.57	0.87
26 Non-metallic mineral products	0.52	0.44	0.69	0.74	0.68	0.85	1.18	1.05
27 Basic metals	23.85	21.09	21.31	19.04	17.32	19.62	22.06	23.68
28 Fabricated metal products	0.62	0.74	0.89	0.91	0.85	1.12	1.38	1.29
29 Machinery and equipment n.e.c.	1.69	1.47	1.97	2.10	1.80	3.12	2.59	2.69
30 Office, accounting and	0.09	0.13	0.14	0.19	0.78	0.00	0.22	0.20

computing machinery								
31 Electrical machinery and apparatus	0.87	0.83	1.07	1.10	1.00	1.11	1.38	1.21
32 Radio, television and communication equipment	0.47	0.50	0.54	0.72	0.85	0.60	0.82	0.77
33 Medical, precision and optical instruments	0.80	0.77	0.74	0.67	0.59	0.85	1.44	1.52
34 Motor vehicles, trailers, semi-trailers	0.86	0.99	1.39	1.65	1.46	1.67	2.00	2.03
35 Other transport equipment	2.03	1.34	2.24	2.53	1.91	3.31	2.00	3.24
36 Furniture; manufacturing n.e.c.	0.37	0.22	1.18	1.37	1.46	1.08	0.89	0.73
37 Recycling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D Total manufacturing	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Author's calculations

Appendix 4.3 Relative structural change in manufacturing exports in EAEU countries (%)

Coefficient of relative structural change	d_{2rel} (2010-2017)	%	d_{2rel} (2016-2017)	%
AM				
15 Food and beverages	0.17	**0.03**	0.22	**0.05**
16 Tobacco products	12.67	**160.46**	0.00	**0.00**
17 Textiles	5.47	**29.87**	0.32	**0.10**
18 Wearing apparel, fur	10.07	**101.33**	0.18	**0.03**
19 Leather, leather products and footwear	0.10	**0.01**	-0.34	**0.11**
20 Wood products (excl. furniture)	0.53	**0.28**	0.39	**0.15**
21 Paper and paper products	0.30	**0.09**	0.39	**0.15**
22 Printing and publishing	-0.66	**0.43**	-0.78	**0.60**
23 Coke, refined petroleum products, nuclear fuel	-0.84	**0.70**	0.00	**0.00**
24 Chemicals and chemical products	-0.24	**0.06**	0.38	**0.15**
25 Rubber and plastics products	-0.32	**0.11**	-0.19	**0.04**
26 Non-metallic mineral products	-0.59	**0.34**	-0.10	**0.01**
27 Basic metals	-0.41	**0.16**	0.05	**0.00**
28 Fabricated metal products	-0.35	**0.12**	-0.35	**0.12**
29 Machinery and equipment n.e.c.	-0.26	**0.07**	0.34	**0.11**
30 Office, accounting and computing machinery (includes 32 and 33)	0.72	**0.52**	0.22	**0.05**
31 Electrical machinery and apparatus	2.77	**7.65**	6.49	**42.12**
32 Radio, television and communication equipment	-0.79	**0.63**	0.09	**0.01**
33 Medical, precision and optical instruments	0.48	**0.23**	-0.39	**0.15**
34 Motor vehicles, trailers, semi-trailers	4.94	**24.44**	-0.08	**0.01**
35 Other transport equipment	-0.87	**0.76**	1.09	**1.20**
36 Furniture; manufacturing n.e.c.	-0.50	**0.25**	-0.58	**0.34**
37 Recycling	0.00	**0.00**	0.00	**0.00**
BY				
15 Food and beverages (includes 16)	0.23	**0.05**	-0.05	**0.00**
16 Tobacco products	0.00	**0.00**	0.00	**0.00**
17 Textiles (includes 18)	0.11	**0.01**	-0.13	**0.02**
18 Wearing apparel, fur	-0.19	**0.03**	-0.09	**0.01**
19 Leather, leather products and footwear	0.44	**0.20**	-0.06	**0.00**
20 Wood products (excl. furniture)	1.96	**3.86**	0.13	**0.02**
21 Paper and paper products (includes 22)	-0.16	**0.02**	-0.05	**0.00**
22 Printing and publishing	-0.43	**0.19**	-0.06	**0.00**

23 Coke, refined petroleum products, nuclear fuel	-0.26	**0.07**	0.08	**0.01**
24 Chemicals and chemical products	0.01	**0.00**	-0.06	**0.00**
25 Rubber and plastics products	-0.13	**0.02**	-0.13	**0.02**
26 Non-metallic mineral products	1.09	**1.18**	0.47	**0.22**
27 Basic metals (includes 28)	-0.07	**0.01**	0.09	**0.01**
28 Fabricated metal products	0.18	**0.03**	-0.06	**0.00**
29 Machinery and equipment n.e.c.	0.13	**0.02**	0.03	**0.00**
30 Office, accounting and computing machinery (includes 31, 32 and 33)	0.01	**0.00**	0.18	**0.03**
31 Electrical machinery and apparatus	-0.06	**0.00**	-0.06	**0.00**
32 Radio, television and communication equipment	0.64	**0.41**	0.11	**0.01**
33 Medical, precision and optical instruments	0.24	**0.06**	-0.16	**0.03**
34 Motor vehicles, trailers, semi-trailers (includes 35)	-0.37	**0.14**	-0.16	**0.03**
35 Other transport equipment	0.00	**0.00**	0.42	**0.18**
36 Furniture; manufacturing n.e.c. (includes 37)	0.22	**0.05**	0.06	**0.00**
37 Recycling	1.06	**1.12**	-0.06	**0.00**
KZ				
15 Food and beverages	0.11	**0.01**	-0.09	**0.01**
16 Tobacco products	1.56	**2.42**	-0.32	**0.11**
17 Textiles	2.71	**7.34**	1.30	**1.68**
18 Wearing apparel, fur	0.00	**0.00**	-0.72	**0.52**
19 Leather, leather products and footwear	-0.56	**0.31**	-0.84	**0.70**
20 Wood products (excl. furniture)	0.00	**0.00**	1.42	**2.02**
21 Paper and paper products	0.25	**0.06**	0.31	**0.10**
22 Printing and publishing	1.64	**2.67**	-0.98	**0.96**
23 Coke, refined petroleum products, nuclear fuel	-0.32	**0.10**	-0.10	**0.01**
24 Chemicals and chemical products	0.47	**0.22**	-0.04	**0.00**
25 Rubber and plastics products	0.96	**0.92**	-0.03	**0.00**
26 Non-metallic mineral products	-0.31	**0.09**	0.29	**0.08**
27 Basic metals	0.08	**0.01**	0.15	**0.02**
28 Fabricated metal products	0.50	**0.25**	-0.29	**0.08**
29 Machinery and equipment n.e.c.	0.61	**0.37**	-0.18	**0.03**
30 Office, accounting and computing machinery (includes 32 and 33)	0.39	**0.16**	-0.17	**0.03**
31 Electrical machinery and apparatus	2.05	**4.21**	-0.23	**0.05**
32 Radio, television and communication equipment	1.02	**1.05**	-0.19	**0.04**
33 Medical, precision and optical instruments	0.23	**0.05**	0.10	**0.01**
34 Motor vehicles, trailers, semi-trailers	0.70	**0.49**	-0.68	**0.47**

35 Other transport equipment	0.24	**0.06**	-0.01	**0.00**
36 Furniture; manufacturing n.e.c.	0.00	**0.00**	-0.21	**0.05**
37 Recycling	0.00	**0.00**	0.00	**0.00**
KG				
15 Food and beverages	-0.05	**0.00**	0.21	**0.04**
16 Tobacco products	3.91	**15.33**	0.39	**0.15**
17 Textiles	-0.48	**0.23**	0.64	**0.41**
18 Wearing apparel, fur	0.00	**0.00**	0.34	**0.12**
19 Leather, leather products and footwear	10.16	**103.18**	1.35	**1.82**
20 Wood products (excl. furniture)	1.00	**0.99**	2.26	**5.11**
21 Paper and paper products	-0.58	**0.34**	0.02	**0.00**
22 Printing and publishing	-0.45	**0.20**	0.96	**0.92**
23 Coke ,refined petroleum products, nuclear fuel	0.00	**0.00**	-0.02	**0.00**
24 Chemicals and chemical products	0.96	**0.92**	0.04	**0.00**
25 Rubber and plastics products	0.20	**0.04**	0.24	**0.06**
26 Non-metallic mineral products	1.39	**1.93**	0.27	**0.07**
27 Basic metals	-0.35	**0.12**	-0.12	**0.01**
28 Fabricated metal products	1.93	**3.73**	0.49	**0.24**
29 Machinery and equipment n.e.c.	0.00	**0.00**	-0.13	**0.02**
30 Office, accounting and computing machinery (includes 32 and 33)	0.00	**0.00**	-0.90	**0.82**
31 Electrical machinery and apparatus	5.98	**35.81**	-0.34	**0.12**
32 Radio, television and communication equipment	19.08	**364.17**	0.15	**0.02**
33 Medical, precision and optical instruments	11.16	**124.63**	-0.66	**0.43**
34 Motor vehicles, trailers, semi-trailers	0.77	**0.60**	0.64	**0.41**
35 Other transport equipment	0.00	**0.00**	0.38	**0.14**
36 Furniture; manufacturing n.e.c.	-0.02	**0.00**	0.21	**0.05**
37 Recycling	0.00	**0.00**	0.00	**0.00**
RU				
15 Food and beverages	1.10	**1.22**	-0.07	**0.01**
16 Tobacco products	0.56	**0.32**	-0.31	**0.09**
17 Textiles	0.98	**0.97**	-0.08	**0.01**
18 Wearing apparel, fur	2.55	**6.48**	0.01	**0.00**
19 Leather, leather products and footwear	0.48	**0.23**	-0.18	**0.03**
20 Wood products (excl. furniture)	0.32	**0.10**	-0.03	**0.00**
21 Paper and paper products	0.28	**0.08**	-0.06	**0.00**
22 Printing and publishing	0.58	**0.33**	0.33	**0.11**
23 Coke, refined petroleum products, nuclear fuel (excludes processing of nuclear fuel)	-0.26	**0.07**	-0.02	**0.00**
24 Chemicals and chemical products	0.04	**0.00**	-0.02	**0.00**

25 Rubber and plastics products	0.28	**0.08**	-0.45	**0.20**
26 Non-metallic mineral products	1.03	**1.07**	-0.11	**0.01**
27 Basic metals	-0.01	**0.00**	0.07	**0.01**
28 Fabricated metal products	1.09	**1.18**	-0.06	**0.00**
29 Machinery and equipment n.e.c.	0.59	**0.35**	0.04	**0.00**
30 Office, accounting and computing machinery	1.28	**1.65**	-0.07	**0.01**
31 Electrical machinery and apparatus	0.40	**0.16**	-0.12	**0.01**
32 Radio, television and communication equipment	0.66	**0.43**	-0.05	**0.00**
33 Medical, precision and optical instruments	0.89	**0.79**	0.05	**0.00**
34 Motor vehicles, trailers, semi-trailers	1.36	**1.85**	0.01	**0.00**
35 Other transport equipment	0.60	**0.36**	0.62	**0.38**
36 Furniture; manufacturing n.e.c.	0.98	**0.97**	-0.18	**0.03**
37 Recycling	0.00	**0.00**	0.00	**0.00**

Source: Author's calculations

Appendix 4.4 Concentration and diversification of manufacturing exports in EAEU countries (%)

	2010	2011	2012	2013	2014	2015	2016	2017
AM								
15 Food and beverages	0.04	0.05	0.06	0.07	0.05	0.03	0.04	0.06
16 Tobacco products	0.00	0.00	0.00	0.00	0.01	0.03	0.03	0.03
17 Textiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18 Wearing apparel, fur	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
19 Leather, leather products and footwear	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 Wood products (excl. furniture)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21 Paper and paper products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22 Printing and publishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23 Coke, refined petroleum products, nuclear fuel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24 Chemicals and chemical products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25 Rubber and plastics products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26 Non-metallic mineral products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27 Basic metals	0.26	0.24	0.17	0.14	0.13	0.11	0.08	0.09
28 Fabricated metal products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29 Machinery and equipment n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30 Office, accounting and computing machinery (includes 32 and 33)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

31 Electrical machinery and apparatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32 Radio, television and communication equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33 Medical, precision and optical instruments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34 Motor vehicles, trailers, semi-trailers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35 Other transport equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36 Furniture; manufacturing n.e.c.	0.02	0.01	0.01	0.01	0.02	0.01	0.02	0.00
37 Recycling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concentration	**0.32**	**0.31**	**0.25**	**0.23**	**0.22**	**0.20**	**0.18**	**0.19**
Diversification	**0.68**	**0.69**	**0.75**	**0.77**	**0.78**	**0.80**	**0.82**	**0.81**
BY								
15 Food and beverages (includes 16)	0.02	0.01	0.02	0.04	0.04	0.02	0.03	0.02
16 Tobacco products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17 Textiles (includes 18)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18 Wearing apparel, fur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19 Leather, leather products and footwear	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 Wood products (excl. furniture)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21 Paper and paper products (includes 22)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22 Printing and publishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23 Coke, refined petroleum products, nuclear fuel	0.09	0.12	0.00	0.00	0.00	0.09	0.04	0.05
24 Chemicals and chemical products	0.03	0.04	0.10	0.03	0.05	0.04	0.03	0.03

25 Rubber and plastics products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26 Non-metallic mineral products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27 Basic metals (includes 28)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28 Fabricated metal products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29 Machinery and equipment n.e.c.	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
30 Office, accounting and computing machinery (includes 31, 32 and 33)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31 Electrical machinery and apparatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32 Radio, television and communication equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33 Medical, precision and optical instruments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34 Motor vehicles, trailers, semi-trailers (includes 35)	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00
35 Other transport equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36 Furniture; manufacturing n.e.c. (includes 37)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37 Recycling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concentration	**0.15**	**0.19**	**0.16**	**0.12**	**0.12**	**0.16**	**0.12**	**0.12**
Diversification	**0.85**	**0.81**	**0.84**	**0.88**	**0.88**	**0.84**	**0.88**	**0.88**
KZ								
15 Food and beverages	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
16 Tobacco products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

17 Textiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18 Wearing apparel, fur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19 Leather, leather products and footwear	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 Wood products (excl. furniture)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21 Paper and paper products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22 Printing and publishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23 Coke, refined petroleum products, nuclear fuel	0.10	0.07	0.09	0.13	0.13	0.10	0.06	0.05
24 Chemicals and chemical products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25 Rubber and plastics products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26 Non-metallic mineral products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27 Basic metals	0.29	0.33	0.28	0.19	0.16	0.22	0.26	0.34
28 Fabricated metal products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29 Machinery and equipment n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30 Office, accounting and computing machinery (includes 32 and 33)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31 Electrical machinery and apparatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32 Radio, television and communication equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33 Medical, precision and optical instruments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34 Motor vehicles, trailers, semi-trailers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

35 Other transport equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36 Furniture; manufacturing n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37 Recycling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concentration	**0.39**	**0.41**	**0.37**	**0.32**	**0.29**	**0.33**	**0.32**	**0.39**
Diversification	**0.61**	**0.59**	**0.63**	**0.68**	**0.71**	**0.67**	**0.68**	**0.61**
KG								
15 Food and beverages	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
16 Tobacco products	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
17 Textiles	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
18 Wearing apparel, fur	0.00	0.00	0.03	0.01	…	0.00	0.00	0.01
19 Leather, leather products and footwear	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
20 Wood products (excl. furniture)	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
21 Paper and paper products	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
22 Printing and publishing	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
23 Coke ,refined petroleum products, nuclear fuel	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
24 Chemicals and chemical products	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
25 Rubber and plastics products	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
26 Non-metallic mineral products	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
27 Basic metals	0.72	0.78	0.46	0.55	…	0.34	0.39	0.30
28 Fabricated metal products	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00

29 Machinery and equipment n.e.c.	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
30 Office, accounting and computing machinery (includes 32 and 33)	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
31 Electrical machinery and apparatus	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
32 Radio, television and communication equipment	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
33 Medical, precision and optical instruments	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
34 Motor vehicles, trailers, semi-trailers	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
35 Other transport equipment	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
36 Furniture; manufacturing n.e.c.	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
37 Recycling	0.00	0.00	0.00	0.00	…	0.00	0.00	0.00
Concentration	**0.73**	**0.79**	**0.49**	**0.57**	**…**	**0.36**	**0.40**	**0.32**
Diversification	**0.27**	**0.21**	**0.51**	**0.43**	**…**	**0.64**	**0.60**	**0.68**
RU								
15 Food and beverages	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16 Tobacco products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17 Textiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18 Wearing apparel, fur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19 Leather, leather products and footwear	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 Wood products (excl. furniture)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21 Paper and paper products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22 Printing and publishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

23 Coke, refined petroleum products, nuclear fuel (excludes processing of nuclear fuel)	0.22	0.25	0.22	0.23	0.26	0.18	0.13	0.12
24 Chemicals and chemical products	0.01	0.02	0.01	0.01	0.01	0.02	0.02	0.01
25 Rubber and plastics products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26 Non-metallic mineral products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27 Basic metals	0.06	0.04	0.05	0.04	0.03	0.04	0.05	0.06
28 Fabricated metal products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29 Machinery and equipment n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30 Office, accounting and computing machinery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31 Electrical machinery and apparatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32 Radio, television and communication equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33 Medical, precision and optical instruments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34 Motor vehicles, trailers, semi-trailers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35 Other transport equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36 Furniture; manufacturing n.e.c.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37 Recycling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concentration	**0.30**	**0.31**	**0.28**	**0.28**	**0.30**	**0.24**	**0.20**	**0.20**
Diversification	**0.70**	**0.69**	**0.72**	**0.72**	**0.70**	**0.76**	**0.80**	**0.80**

Source: Author's calculations

Appendix 4.5 Manufacturing exports structure by technological level of industry in EAEU countries (current prices, USD million)

	2010	2011	2012	2013	2014	2015	2016	2017
AM								
Low-tech	237	298	377	476	545	529	749	793
Medium low-tech	364	439	432	419	414	342	384	446
Medium high- and high-tech	59	85	129	83	65	70	91	141
BY								
Low-tech	4979	5933	6699	7542	7300	5531	5887	7126
Medium low-tech	10100	17162	4464	4427	4572	9998	7226	9687
Medium high- and high-tech	8642	14146	15983	10875	10549	8528	8119	9686
KZ								
Low-tech	1034	1261	1804	1449	1369	1297	1545	1382
Medium low-tech	13050	19073	21250	15749	14060	11114	9793	12810
Medium high- and high-tech	1008	1842	2382	2314	2933	1589	1530	1620
KG								
Low-tech	78	89	207	161	0	152	165	284
Medium low-tech	698	1050	617	822	0	802	809	912
Medium high- and high-tech	22	11	14	13	0	204	183	236
RU								
Low-tech	13171	15761	22092	24633	25910	20952	20947	25049
Medium low-tech	112136	139314	162843	165341	167611	109215	84825	109285
Medium high- and high-tech	28345	36062	45474	46655	44823	38886	31108	41819
EAEU								
Low-tech	19499	23342	31179	34261	35124	28460	29293	34633
Medium low-tech	136348	177039	189605	186758	186657	131471	103037	133139
Medium high- and high-tech	38076	52146	63983	59941	58370	49277	41032	53503

Source: UNCTADstat Data Portal, author's calculations

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