4

Industrial Production Restructuring

In the past two decades, Romanian industry has been the object of unprecedented restructuring, which caused an enormous amount of turmoil, the real magnitude of which, with regard to economic and social effects, to the changes in the industrial landscape of the country and to the loss of a wealth of knowledge and skills, is far greater than statistics can express.

Below we analyse the restructuring process by considering the developments, in real terms, of the total industrial production and that of its three subsectors (mining and quarrying, manufacturing and the production and supply of electricity, heating, gas and water) from the perspective of the indicators of System of National Accounts and also from the physical production perspective.

4.1 Industrial Production Developments in Real Terms

If we were consider value indicators in current prices, it would be difficult to create an accurate and coherent picture of the level of some of the industrial sectors, due to inflation, which, in itself, was a factor that

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contributed to the defragmentation and rebuilding of economic and industrial structures and sometimes did much more than the necessary reconfigurations brought about by technological developments, innovation, promotion of new products among other factors.

The *indices of the industrial production in constant prices* is the most relevant statistical instrument for the measurement of the magnitude of a restructuring process, although these indices, like any average unit of measure, may conceal significant details.

A careful analysis of the indices of industrial production as a whole, and also by branches, sub-branches, activities and products, reveals that, particularly during the first ten years of Romania's transition to a market economy, more than half of the country's industrial production simply vanished, along with the technical infrastructure, knowhow, competence and skills and ultimately the workforce employed in industry.

In 2000, for example, the total industrial production, in constant prices, had diminished to 58% of that in 1990; the most drastic losses were registered by the sub-branches rubber and plastic materials (down to 24.4% of the production in 1990), metal construction (31.9%), chemical substances and products (32.4%), textile products (35%), machinery and equipment (36.1%) (Appendix A.5).

The only rise on the production side in 2000, compared to 1990, was in the manufacture of furniture and other industrial activities (141.1%), clothing (137.6%) and electrical machinery and apparatuses (120.6%).

As for total industrial production—including the sectors extraction/mining industry; manufacturing industry; and the production and supply of electricity, heating, gas and hot water (Table 4.1)—the indices show that, compared to the 1990 level, it stood at 94.7% in 2011, at 106.5% in 2013 at and at 116.1% in 2015.

Even during the economic crisis, the *manufacturing industry* managed to exceed its 1990 output, following a curve that dropped to 98.5% in 2010 but then rose to 104.0% in 2011 and 132.1% in 2015.

The output in the extraction/mining industry continued to drop, compared to 1990—from 65.1% in 2000 to 56.7% in 2011—though it

Table 4.1 Real indices of the industrial production (1990 = 100.0)

	1995	2000	2005	2007	2010	2011	2012	2013	2014	2015
Real index of total industrial production	65.4	58.1	72.7	82.1	89.7	94.7	98.8	106.5	112.9	116.1
Real index of manufacturing industry	62.7	57.9	76.4	87.7	98.5	104.0	108.7	118.7	127.6	132.1
Real index of extraction/ mining industry	83	65.1	65.7	67.1	81.1	56.7	92.1	94.2	102.1	83.2
Real index of electricity, heating, gas and hot water	79.2	58.5	53.2	55	59.4	63.2	63.1	62.3	59.3	60.1

Source: Authors' own compilation based on data from *Romania's Statistic Yearbook*, NIS, Bucharest, various editions

managed to recover to 83.2% in 2015; meanwhile in 2000 the *production and supply of electricity, heating, gas and hot water* plunged to 58.5% of the 1990 level, increased slightly to 63.2% in 2011, and dropped again to 60.1% in 2015.

The period after 2005 saw remarkable growth in the *manufacture of road transport vehicles*, mainly cars, expressed in terms of the 1990 level—from 86.6% in 2000, to 387.3% in 2011 and to 485.0% in 2014, an almost fivefold increase (Appendix A.5).

Another thriving sector has been the *manufacture of tobacco* products: after a slight a decline in 2000 to 99.6% of 1990 levels, it rose to 162.1% in 2011 and 192.8% in 2014.

Wood processing has been another standout sector, although the main operations consisted of primary processing: up in 2011 to 134.7% of 1990 levels and 158.7% in 2014, after a slump to 49.5% in 2000. *Electrical machinery and apparatuses* surged to 192.5% in 2007, then slumped to 106.9% in 2011, only to rise again to 152.9% in 2014.

Practically speaking, the best hope for Romania to have a modern and competitive industry lies in the car manufacturing sector, because the upgrading of industry cannot be led by the tobacco manufacturers or by

the export of processed wood products or scrap iron (of which there isn't much left anyway).

The four big branches of production which experienced the biggest declines, compared again to 1990 levels, were the *mining and preparation of metallic ores* (in 2008 it was only 1.5% of the production of 1990); the *metallurgical industry*, which went down in 2011 to 46.9% and in 2014 to 42.1% of 1990 levels; the *manufacture of textile products*, the output of which, in 2011, had diminished to 36.9%, and in 2014 to 47.1% of 1990 levels; the production of *means of transport other than road transport, such as air, rail, sea- and river-going vessels* was reduced to 39.8% in 2011 and 70.1% in 2014 of 1990 levels.

Taking as reference the month of December 2005, and in line with the latest NACE aggregation, the indices of industrial production in the past decade (2005–2015) for the overall domestic market and external market, appear as in Table 4.2.

The figures in Table 4.2 indicate that the highest price rises occurred in the water supply and sanitation and tobacco sectors.

The course followed by Romania's industry is not an exception by comparison to other EU member states.

Taking the year 2005 as reference, we can see that the output of the mining industry in Romania had grown 1.60 times, by 2015, which was less than the growth of the same industry in Slovakia—1.94 times, or Poland—1.61 times, but higher than in all the other EU member states (Appendix A.6).

In the manufacturing industry, output grew 1.73 times during the same reference period, 2005–2015, which places Romania the third among the EU member countries, after Slovakia and Poland (Appendix A.7). The production of electricity, heating, gas and hot water in Romania grew 1.13 times, which was slightly below the figures for Bulgaria (1.16 times) and Austria (1.15 times) (Appendix A.8).

At a time when the EC's policy is targeting competition in the field of energy and raw materials and the efficient use of the member countries' resources, the extraction/mining industries of Romania still are experiencing positive developments.

Table 4.2 Price indices of industrial production by activities (CAEN Rev. 2) and large groups of industries (December 2005 = 100.0)

Branch/Sub-branch	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
TOTAL	**100.0**	**106.9**	**116.1**	**125.5**	**128.6**	**137.6**	**145.9**	**152.9**	**152.8**	**150.8**	**148.2**
Mining industry	**100.0**	**121.0**	**143.0**	**136.3**	**136.2**	**139.6**	**146.9**	**147.9**	**157.1**	**153.1**	**143.9**
Mining of hard coal and lignite	100.0	111.3	123.7	127.2	135.5	136.1	141.5	153.9	147.1	144.4	141.5
Extraction of crude oil and natural gas	100.0	124.2	151.1	137.6	136.9	136.1	138.5	142.8	163.8	154.2	135.4
Other extraction/mining activities	100.0	107.3	115.4	128.9	131.3	131.8	137.9	142.6	144.4	146.7	146.1
Activities ancillary to extraction/mining activities	100.0	124.2	151.1	137.6	132.6	147.0	176.6	158.2	151.1	158.8	174.5
Manufacturing industry	100.0	106.2	116.0	126.7	130.5	141.2	149.9	158.2	155.8	152.2	150.0
Food industry	100.0	106.4	123.1	135.1	136.5	148.0	159.4	177.5	170.8	167.9	169.0
Manufacture of beverages	100.0	108.5	111.8	128.0	139.4	143.8	149.6	155.8	167.4	170.8	176.7
Manufacture of tobacco products	100.0	124.2	134.8	155.6	189.4	223.6	215.6	221.9	230.6	240.3	245.7
Manufacture of textile products	100.0	101.4	110.2	119.0	122.4	132.4	140.8	152.0	159.7	163.0	168.3
Manufacture of clothing	100.0	109.8	125.4	141.0	152.6	162.6	171.9	185.1	193.3	203.3	211.5
Tanning and dressing of hides; manufacture of travelling bags and luggage, leather items, saddlery and harness, and footwear; dressing and dyeing of furs	100.0	115.7	131.6	148.1	161.7	174.2	190.7	201.6	201.1	210.0	215.0
Processing of wood; manufacture of wooden and cork products, except for furniture; manufacture of straw items and other plaiting vegetal materials	100.0	104.6	113.5	126.7	124.1	128.8	136.9	143.8	148.0	151.2	157.3
Manufacture of paper and paper products	100.0	105.3	115.1	130.0	127.3	142.3	156.7	163.6	169.1	170.5	170.7

(*continued*)

Table 4.2 (continued)

Branch/Sub-branch	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Printing and reproduction of recorded media	100.0	105.0	117.8	124.9	136.4	139.9	159.9	175.5	177.6	178.8	179.3
Manufacture of coking products and of petroleum-based products	100.0	113.6	140.8	103.1	135.0	182.7	210.6	226.7	213.2	152.5	124.2
Manufacture of chemical substances and products	100.0	103.9	108.4	123.1	122.8	130.7	144.5	155.7	149.4	146.2	130.8
Manufacture of basic pharmaceutical products and pharmaceutical preparations	100.0	105.7	101.8	113.6	135.9	159.3	163.1	172.6	179.9	185.0	197.0
Manufacture of rubber and plastic products	100.0	116.5	114.8	120.7	122.8	127.4	134.7	144.1	143.9	144.6	146.1
Manufacture of other of non-metallic mineral products	100.0	105.6	112.1	124.9	123.2	122.0	121.3	126.5	124.0	123.6	121.0
Metallurgical industry	100.0	111.0	114.8	141.9	130.4	156.2	164.5	165.9	149.8	152.3	133.1
Industry of metal structures and metal products, except for machines, machinery, and equipment	100.0	100.8	119.3	136.4	134.5	138.9	148.0	152.7	146.0	142.6	138.2
Manufacture of computers, of electronic and optical devices	100.0	101.1	114.9	117.1	112.4	128.3	133.0	135.1	130.3	125.1	122.7
Manufacture of electrical equipment	100.0	115.5	125.1	135.0	135.7	145.3	150.9	153.1	152.1	150.4	148.4
Manufacture of machines, machinery, and equipment n.e.c.	100.0	107.4	110.7	130.0	133.8	138.7	140.3	147.9	149.1	146.8	149.4
Manufacture of road transport vehicles, trailers and semi-trailers	100.0	98.6	106.0	119.6	124.6	128.7	135.3	141.0	140.8	139.3	141.9
Manufacture of other means of transport	100.0	103.5	106.8	121.5	135.2	138.1	143.9	153.3	153.7	154.1	148.9
Manufacture of furniture	100.0	104.8	111.4	122.2	129.4	132.0	135.1	139.7	143.6	146.6	151.4
Other industrial activities n.e.c.	100.0	101.3	104.2	124.6	133.9	139.3	147.9	153.8	160.2	169.4	178.4

(*continued*)

Table 4.2 (continued)

Branch/Sub-branch	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Repair, maintenance and construction of machines and equipment	100.0	107.8	115.9	129.9	134.8	143.1	148.3	149.9	150.5	150.5	153.0
Production and supply of electricity, heating, gas, hot water and air conditioning	100.0	106.6	110.9	117.8	118.1	121.0	127.0	129.6	136.2	140.0	137.1
Water supply, sanitation, waste management; decontamination activities	100.0	124.3	137.6	148.7	167.6	181.7	230.9	245.8	273.3	283.2	292.8
Industry of intermediate products	100.0	110.3	117.6	131.7	128.9	140.2	148.1	154.3	149.6	150.1	145.5
Industry of capital goods	100.0	100.3	109.8	122.0	124.8	131.2	136.7	141.8	140.0	137.5	137.9
Industry of durables goods	100.0	90.9	95.4	104.1	109.2	110.1	115.4	120.3	121.5	122.7	124.4
Industry of goods for current use	100.0	107.3	117.0	131.5	139.6	147.7	157.6	170.8	173.1	174.7	178.1
Energy industry	100.0	109.5	119.4	117.7	123.6	133.7	144.0	149.2	154.0	146.4	138.6

Note: n.e.c - not elsewhere classified

Source: Authors' own compilation based on data from Tempo online, NIS

4.2 Evolution from the Perspective of the System of National Accounts

The *analysis of the national accounts (National Accounts 2012–2013*, NIS 2016) provides a complementary perspective of how some industrial indicators have changed.

Appendix A.9 displays the figures regarding the *gross production, intermediate consumption and the gross value added*, expressed in euro for the three industrial sectors; and Appendix A.10 displays the same parameters for sub-branches and activities in the manufacturing industry.

Of great importance are the indices of the gross production, intermediate consumption and gross value added based on data provided by *Romania's Statistic Yearbook*, NIS, various editions (Table 4.3).

In 2013, compared to 1990, the gross production in the manufacturing industry increased by 51.4%, while in the extraction/mining industry, gross production dropped to 53.6%; the production and supply of electricity, heating, gas and water dropped to 96.2%.

In the past 24 years, the gross value added grew in the manufacturing industry by 17.3%, but diminished in the extraction/mining industries to less than a quarter (24.6%) (Fig. 4.1).

Although gross production and intermediate consumption diminished, the gross value added in the energy sector had a spectacular growth spurt of 4.2 times by 1995 and 3.42 times by 2013 as compared with 1990 (Fig. 4.2).

This growth, which was generated by the policies designed to align internal prices to global prices for the sake of competition and not necessarily in line with domestic production costs, presented a major challenge, representing as it did a significant effort to increase competitiveness of the entire Romanian economy and manufacturing industry, regardless of global market trends.

The data for the years 1991, 2002, 2005, 2010 and 2013 for the balance of resources/use per product (the System of National Accounts) (Appendixes A.11, A.12, A.13, A.14 and A.15) prompt us to draw the following important conclusions.

On the *resource* side:

Table 4.3 Indices of gross production, intermediate consumption and gross value added, in industry (1990 = 100.0)

Branch	Indicator	1995	2000	2005	2007	2008	2009	2010	2011	2012	2013
Mining industry	Gross production	82.9	65.0	70.8	73.0	58.8	61.5	68.2	83.1	66.2	53.6
	Intermediate consumption	99.3	77.6	92.0	95.2	75.0	78.1	83.3	133.3	105.0	95.5
	Gross value added	64.5	50.3	48.9	49.9	41.7	44.1	51.9	42.8	35.0	24.6
Manufacturing industry	Gross production	79.9	84.1	119.7	138.7	143.6	135.7	137.7	142.5	141.5	151.4
	Intermediate consumption	81.8	88.5	129.6	151.0	157.4	147.1	148.2	159.0	162.2	172.9
	Gross value added	75.9	74.9	100.9	115.6	118.4	114.0	117.3	114.6	108.8	117.3
Electricity, heating, gas and water	Gross production	95.4	75.3	80.7	84.5	96.6	110.4	93.2	109.2	108.1	96.2
	Intermediate consumption	77.9	65.3	72.0	75.5	87.4	99.5	83.2	95.1	98.0	84.9
	Gross value added	420.3	281	275.6	286.0	311.5	361.6	316.4	387.6	356.6	342.3

Source: Authors' own compilation based on data from *Romania's Statistic Yearbook*, NIS, Bucharest, various editions

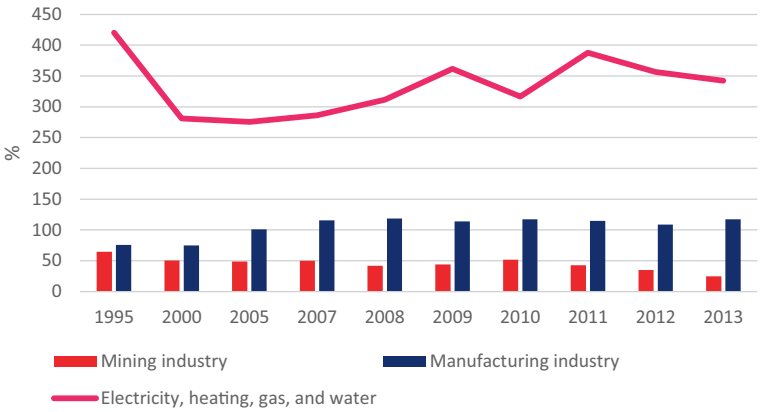

Fig. 4.1 Indices of gross value added, in industry, by subsectors (1990 = 100.0). Source: Authors' own compilation based on data from *Romania's Statistic Yearbook*, NIS, Bucharest, various editions

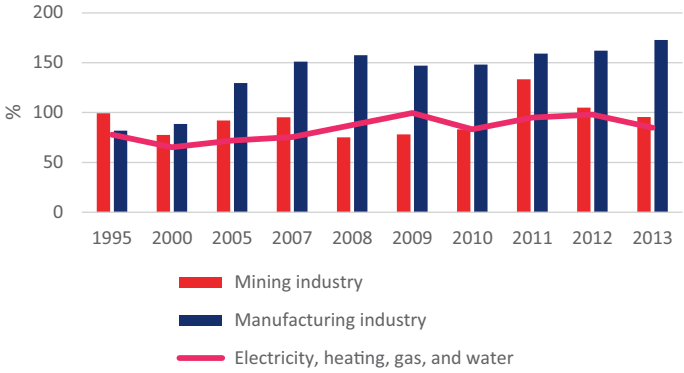

Fig. 4.2 Indices of intermediate consumption, in industry, by subsectors (1990 = 100.0). Source: Authors' own compilation based on data from *Romania's Statistic Yearbook*, NIS, Bucharest, various editions

- *Imports* increased their share from a *minimum of 3.1%* for rubber and plastic material products and a *maximum of 14.1%* for the extraction/mining industry products *in 1991*, to shares between a *minimum of 0.6%* for electric power and a *maximum of 49.7%* for machine building, household appliances and spare parts; *44.3%* for textile products, and *39.6%* for chemical products, *in 2002*. *In 2010,* the share of

imports versus total resources stood at *54.4%* for computers and electronic products; at *54.1%* for machines, machinery and equipment; *52.3%* for electrical equipment; *48.6%* for chemical products; *47.4%* for basic pharmaceutical substances and pharmaceutical preparations. In 2013, imports accounted for *57.2%* of the resources for the manufacture of computers, electronic and optic products; *53.6%* for the manufacture of machines, machinery and equipment; and over *50%* for the manufacture of electrical equipment and products of the chemical industry.

- *The share of the commercial and transport margins in overall resources* went from a *minimum of 0.3%* in energy, *2.7%* for the means of transport, *3.5%* for the products of the chemical industry, *3.6%* for the products of the electro technical industry *in 1991* to *37.5%* for the products of the extraction industry, *36.3%* for pharmaceutical substances and preparations, *24.5%* for products obtained from processing of crude oil, *23.7%* for products of the food industry, beverages, tobacco, *in 2010*. *In 2013*, the share of commercial and transport margins was *37.9%* for pharmaceuticals, *27.2%* for the extraction industry, *18.1%* for crude processing and *17.6%* for the products of the chemical industry.
- *Subsidies per product* represented *10.0%* of the resources for energy, *3.2%* for products of the food industry, *1.1%* for textiles and clothing and *0.5%* for products of the extraction/mining industry *in 1991*; *in 2010,* they accounted for only *0.6%* of all resources for electricity, heating, gas and steam, and 0.1% for the extraction industry, electrical equipment, a share that increased to *1.5%* in 2013:

On the *utilisation* side:

- in *1991*, *exports* held maximum shares of *18.0%* for wood, paper and cardboard products; *15.7%* for the means of transport, *15.2%* for the products of the metallurgical industry and *12.9%* for chemical products; in *2010*, exports accounted for a share of *55.4%* for electrical equipment; *42.0%* for textile products and clothing; *38.0%* for means of transport; *30.4%* for machines, machinery and equipment; *26.8%* for metallurgical products and metal structures; *22.3%* for wooden products; *in 2013*, exports had reached shares of *55.3%* for electrical

equipment, *53.9%* for furniture, *46.6%* for the production of means of transport, and *39.9%* for wooden products; large shares were also held by rubber products, machines and equipment.

- The *rate of intermediate consumption as a share of overall use* tended to diminish; *in 2013*, the intermediate consumption accounted for over *92%* in the extraction industry, *81.8%* for the production of electricity and gas, *71.7%* in the metallurgical industry, *67%* in the textile industry, *65%* in the chemical industry, *60%* crude processing and *58.8%* for rubber and plastic materials. On a similarly descending path in 2010 was the *production remaining on stock*: the largest stocks that year were recorded in the extraction/mining industries (*2.9%*) and in the production of furniture, and other industrial goods (*2.4%*), compared with *17.9%* in the means of transport industry, *9.4%* in the manufacture of machines, *9.0%* in the extraction/mining industries and *8.4%* in the industry for textile products, compared to levels in 1991. *In 2013*, the tendency for stocks to decrease continued, with the largest of them (*2.2%*) being recorded in the pharmaceutical industry.

The economic restructuring process can also seen in the changes in the shares held by certain groups of industrial products in the main macroeconomic indicators of the national accounts (Appendixes A.16, A.17, A.18, A.19 and A.20).

Even if the groups of products are not entirely comparable, the revisions brought to the classification of activities in the national economy for the purpose of aligning it to the methodology and standards of international classification and the basic structure of the groups allows for a comparative study:

- the share of the main groups of industrial products in the *total production of goods and services in the economy* dropped from 71.9% in 1991, to 36.0% in 2010 and 36.8% in 2013;
- *in the total intermediate consumption for overall economy, these groups of products accounted for* 88.9% in 1991, 59.5% in 2010 and 43.1% in 2013;

- the shares of industrial products in the *gross value added* diminished from 39.8% in 1991 to 31.9% in 2010 and to 28.6% in 2013; and the share in the total compensation of employees dropped from 45.6% in 1991, to 26.9% in 2010 and to 27.1% in 2013;
- in the total amount of *subsidies per product*, these groups of products accounted for 83.4% in 1991, 18.6% in 2010 and 42% in 2013;
- the shares held in *production-related taxes* grew from 42.9% in 1991, to 67.3% in 2010 and 62.7% in 2013; and in the *gross operating surplus* the shares of the groups of industrial products dropped from 36% in 1991, to 34.6% in 2010 and to *28.8%* in 2013.

It would also be interesting to see the *share of exports and imports in the production of goods and services* by main groups of industrial products (Table 4.4, Fig. 4.3).

In 2010 and 2013, the statistical data show that, in some of the groups of products, imports exceeded the production of goods and services within the group: while in 2010 this was the case in the group of basic pharmaceuticals, the chemical industry, processing of crude oil and the manufacture of computers, electrical equipment, machines and machinery, in 2013 this happened also in the extraction/mining industry, where imports exceeded the domestic production by 70 mil. euro. The one exception: coking products obtained from crude processing, where imports were much below levels of domestic production. In this group, the ratio between domestic production and imports displayed a thorough reversal: from domestic production of 2.8 bn. euro and imports of 3.95 bn. euro in 2010 to domestic production of 7.37 bn. euro, and imports of only 1.7 bn. euro in 2013. This leads us to believe that Romania is being steered to import when prices are high and to export when prices on the domestic market are low.

In 2013, the greatest *surplus in the foreign-trade* transactions was seen in the manufacture of road transport vehicles (over 4 bn. euro), followed by the manufacture of furniture and other industrial goods n.e.c. (approximately 950 mil. euro); wooden products; paper (779 mil. euro), textile and clothing products; water supply and products obtained from crude oil processing.

But in the case of the other eight groups of industrial products, the foreign trade balance was negative; the highest *deficit* was recorded in

Table 4.4 Share of imports and exports in the production of goods and services in some of the groups of industrial products, in 2013

Group of products	Production of goods and services (mil. euro)	Import (mil. euro)	Share of imports in the production of goods and services (%)	Export (mil. euro)	Share of exports in the production of goods and services (%)	Balance of foreign trade operations (mil. euro)
Products of the mining industry	3257.8	4070.4	124.9	337.2	10.3	−3733.3
Textile, footwear and leather products	6481.6	3175.4	49.0	3669.3	56.6	494.0
Food, beverages and tobacco products	20,046.2	3711.8	18.5	2127.6	10.6	−1584.2
Wooden products, paper, printing services	5200.5	1181.4	22.7	1960.2	37.7	778.8
Coking products and products obtained from processing of crude oil	7374.6	1731.3	23.5	2073.5	28.1	342.2
Products of the chemical industry	2612.4	4490.0	171.9	1829.3	70.0	−2660.6
Basic pharmaceutical products and pharmaceutical preparations	630.8	2818.8	446.9	1028.3	163.0	−1790.5
Products made of rubber and plastic materials and products made of other non-metallic minerals	6621.2	3228.3	48.8	2799.8	42.3	−428.5
Products of the metallurgical industry, metal structures and metal products (except for machines, machinery and equipment)	9125.2	5715.7	62.6	4281.5	46.9	−1434.1
Computers, electronic and optical devices	2344.3	4505.4	192.2	2430.6	103.7	−2074.8
Electrical equipment	3659.7	4474.8	122.3	4785.0	130.7	310.1

(*continued*)

Table 4.4 (continued)

Group of products	Production of goods and services (mil. euro)	Import (mil. euro)	Share of imports in the production of goods and services (%)	Export (mil. euro)	Share of exports in the production of goods and services (%)	Balance of foreign trade operations (mil. euro)
Machines, machinery and equipment	3179.9	5420.2	170.5	3786.9	119.1	−1633.3
Means of transport	12,634.0	4468.3	35.4	8509.6	67.4	4041.4
Furniture, other industrial goods, repair, maintenance, and construction services	5288.2	1197.7	22.6	2147.5	40.6	949.8
Electricity, gas, steam and air conditioning	14,754.8	16.7	0.1	104.5	0.7	87.7
Water supply, sanitation, waste management, decontamination services	3613.3	122.9	3.4	858.4	23.8	735.5
Total 16 groups of industrial products	106,824.3	50,329.0	47.1	42,729.1	40.0	−7599.9

Source: Authors' own compilation based on data from *National Accounts 2012–2013*, NIS, Bucharest, 2016

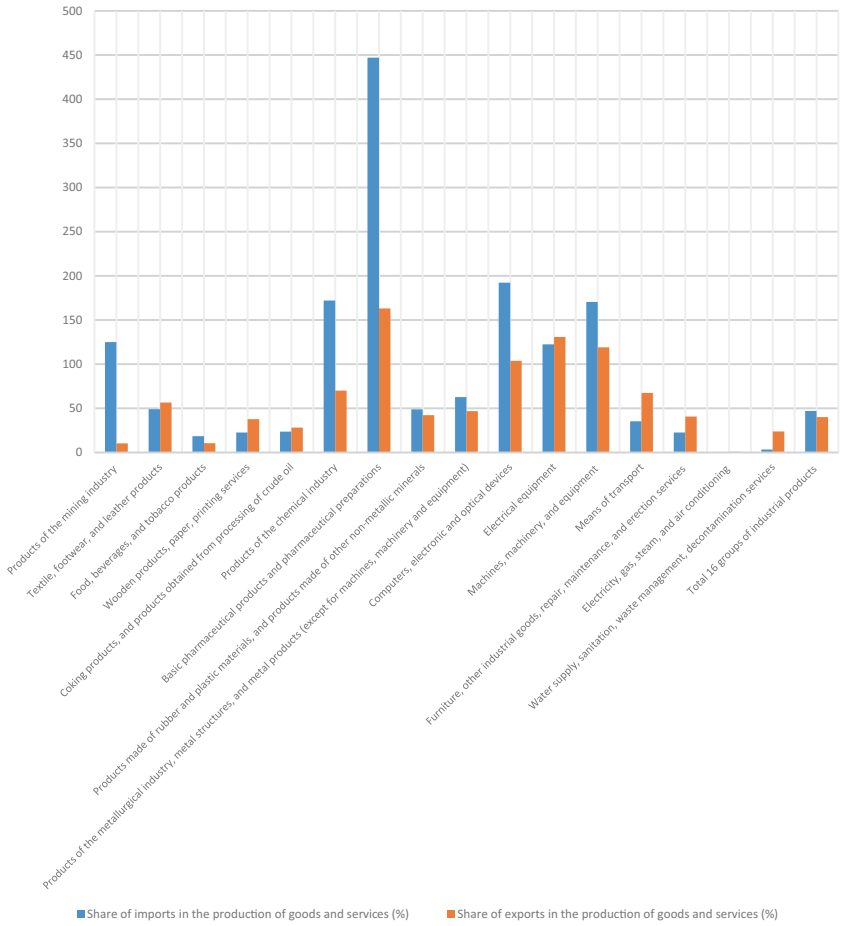

Fig. 4.3 Share of imports and exports in production, by groups of industrial products, in 2013 (%). Source: Authors' own compilation based on data from *National Accounts 2012–2013*, NIS, Bucharest, 2016

the mining industry at over 3.7 bn. euro; the chemical industry, over 2.66 bn. euro; the manufacture of computers and electronic products, 2.07 bn. euro; the manufacture of pharmaceuticals, 1.8 bn. euro; the manufacture of machines, machinery and equipment; over 1.6 bn. euro; and the food industry, 1.58 bn. euro.

4.3 The Slumping Curve of Physical Production

The decline of industries based on the technologies and market principles specific to previous industrial revolutions—which some experts, journalists, and political decision-makers prefer to call "*deindustrialisation*"[1]—can be seen to be in full swing if we analyse the graph showing the physical production of the main industrial products (Appendix A.21).

Although this decline is real, it will not completely put an end to certain industrial products, which will continue to be manufactured in the context of the new industrial revolution (NIR).

If we take a look at Tempo database (*Tempo Online*, NIS) the products generically included in the *group of raw materials and energy*, we will notice that in 2014, the production of electric power diminished by some 13%, which translates into 10 bn. Kwh, with 1989 as year of reference; the production of heating in 2014 represented 15.6% of the production of heating in 1988 (28.5 bn. Kcal, six times less than 182.4 bn. Kcal); the total quantity of mined coal dropped by some 42 mil. tonnes (which was 37% of what had been in 1989), and the production of iron ore practically ceased to exist.

The production of other essential raw materials—extracted crude oil and natural gas—is declining mainly because of the depletion of some of the natural reserves: the quantity of extracted crude, for example, went down from more than 13.3 mil. tonnes in 1970 to some 3.9 mil. tonnes per year in 2013 and 2014, and the volume of extracted natural gas has steadily declined—from 40.8 bn. cm in 1980 (when the peak of domestic production was reached), to 28.3 bn. cm in 1990, 14.6 bn. cm in 2000 and 11.4 bn. cm in 2014.

Similarly, a concomitant, dramatic decrease in the production of diesel oil occurred: after a drop from 8.5 mil. tonnes in 1988 to 3.8 mil. tonnes in 2011, production rose in 2014 to 5.1 mil. tonnes; the production of fuel oil diminished from 10.2 mil. tonnes in 1980 and 8.1 mil. tonnes in 1990 to 320,700 tonnes in 2014; mineral oils declined from 664,000 tonnes in 1980 and 85,000 tonnes in 2006 to 24,200 tonnes in 2014.

In the *metal production* group, the output of steel dropped from 14.4 mil. tonnes in 1989 to 3.8 mil. tonnes in 2011 and 3.2 mil. tonnes in

2014; the production of cast iron decreased from 9.3 mil. tonnes to 3.9 mil. tonnes in 2006; and the production of finished rolled products went down from 9.3 mil. tonnes to 4 mil. tonnes in 2011 and 3.2 mil. tonnes in 2014. As for the mining of ores like iron, copper, lead, zinc and gold among others, statistics have not been reported.

Industrial products show drastic reductions in the manufacture of electric motors (19.2 mil. Kwh in 1980, then dropping to 0.7 mil. Kwh in 2011 and 0.3 mil. Kwh in 2014) and electric generators—from 1.1 mil. KwA in 1980 to 0.1 mil. KwA in 2000, after which this category leaves is left blank in Romania's statistics. The production of electric transformers dropped from 15.9 mil. KwA in 1980, to 5.4 mil. KwA in 2011 and 2.7 mil. KwA in 2013.

The production of machine tools (lathes, milling machines, metal-cutting machines, rectifying machines, boring machines) plummeted from 13,000 items in 1980 to 71 items in 2011. The production of *machinery and equipment for exploration and drilling* decreased from 166,000 tonnes in 1986 to 49,000 tonnes in 2008; similarly, the *production of machines and equipment for various industries* was reduced from 689,000 tonnes in 1986, to 12,000 tonnes in 2011. For the subsequent years, no statistics are provided. While in 1980, Romanian industry manufactured 71,000 tractors, 1612 excavators and road rollers, 276 locomotives, 14,060 freight cars (in 1987), 601 passenger cars, 35,000 lorries (in 1970) and 144 sea- and river-going vessels, nothing was reported in subsequent years on the production of excavators, tractors, locomotives, lorries, ships/boats, road-rollers and passenger railway cars.

In the *group of chemical products*, in 1986, Romanian industry manufactured 2.4 mil. tonnes of sulphuric and chlorhydric acid, as against 0.2 mil. tonnes in 2011 and 0.1 mil. tonnes in 2013 and 2014, respectively; in 1985, Romania produced 3.1 mil. tonnes of chemical fertilisers (100% equivalent active substance—eas), a level of production which then declined to 1.3 mil. tonnes in 2011 and to 0.785 mil. tonnes in 2014.

On the rise, however, was the production of car tyres, from 5 mil. pieces in 1990, to 28 mil. pieces in 2011 and 23,5 mil. pieces in 2014; the production of detergents (100% eas) from 11,600 tonnes in 1990, to 206,700 tonnes in 2011 and 230,900 tonnes in 2014.

In the *building materials* category, the production of cement diminished from 14.6 mil. tonnes in 1980, to 8.1 mil. tonnes in 2011 and

7.6 mil. tonnes in 2014; the production of glass plunged from 77.5 mil. sqm in 1980 to 16 mil. sqm in 2006; and the production of timber went up from 2.9 mil. cm in 1990, to 5.1 mil. cm in 2011 and 5.9 mil. cm in 2014.

Other industries, such as the *production of textiles*, simply nosedived: cotton and cotton-like yarns from 183,000 tonnes in 1980, to 18,100 tonnes in 2011 and 12,500 tonnes in 2014; wool and wool-type yarns from 75,800 tonnes in 1987, to 29,100 tonnes in 2011 and 27,900 tonnes in 2014; linen and hemp yarns from 45,500 tonnes in 1980, to 1400 tonnes in 2008 and 500 tonnes in 2011; fabrics from 1.154 mil. sqm in 1980, to 44.2 mil. sqm in 2011, with a modest comeback to 70.8 mil. sqm in 2014; knitwear from 296 mil. items in 1980, to 27.6 mil. items in 2011 and 23 mil. items in 2014; the *production of footwear* from 118 mil. pairs in 1989, to 45.9 mil. pairs in 2011, with a slight increase to 51.6 mil. pairs in 2014.

A similar downward trend occurred in a number of industries, which, after 2011, went through a slight recovery: in the *food industry*, the production of meat fluctuated from 993,000 tonnes in 1980, to 259,000 tonnes in 2000, and up again to 579,700 tonnes in 2011 and 680,300 tonnes in 2014; fresh milk from 5.9 mil. hl in 1980, to 2.2 mil. hl in 2011 and to 2.6 mil. hl in 2014; edible oils from 392,000 tonnes in 1987, to 203,800 tonnes in 2011 and to 273,700 tonnes in 2014; sugar from 716,000 tonnes in 1989, to 384,200 tonnes in 2011 and 437,500 tonnes in 2014; canned meat from 77,000 tonnes in 1980, to 25,500 tonnes in 2011 and to 33,700 tonnes in 2014; tinned fruit and vegetables from 540,000 tonnes in 1980, to 70,400 tonnes in 2011 and 76,500 tonnes in 2014; and salt from 5.4 mil. tonnes in 1987 to 2.6 mil. tonnes in 2006.

One thriving industries was the manufacture of *tobacco products*, which rose from 27,000 tonnes in 1990, to 49,000 tonnes in 2011 and to 56,800 tonnes in 2014.

Many of these developments were not the effect of innovative thinking or restructuring of the physical production in various industries; in fact, many of the products referred to above were outdated from the technical or quality points of view.

Some products died out either because of competition with similar, imported, goods—albeit these were of no better quality (for example,

salt, in the case of which it is hard to claim a better quality standard, as if imported salt could be saltier than the domestic one); or they were ousted by imports of *second-hand* products, as was the case with clothing discarded by Western Europeans which invaded the Romanian market, thus causing the loss of more than two-thirds of the domestic production of textiles and ready-mades, together with the related jobs. All these disruptions and distortions are the result of the free circulation of goods on the Romanian market, which was left defenceless in the absence of an adequate regulatory framework regarding quality both ex-ante and ex-post; they were also caused by the very poor terms that were accepted by the Romanian pre-accession negotiators (e.g., in the case of milk, meat, sugar, steel, etc.).

Both the developments in real terms of the value of total industrial production in the three sub-sectors and those reflected by the specific indicators of the System of National Accounts and by the indicators of physical production reflect substantial changes in the hierarchy of industrial branches and sub-sectors, in their financial flows with the other sectors of the economy and also with the external environment.

Notes

1. See, for example, (Chatillon 2011)

References

Chatillon, Alain. 2011. *Rapport d'information sur la deindustrialisation des territories*, No. 403. Senat France. http://www.senat.fr/notice-rapport/2010/r10-403-1-notice.html

National Accounts 2012–2013. 2016. NIS, Bucharest.

Romania's Statistic Yearbook, n.d. NIS, Bucharest, various editions.

Tempo Online, n.d. NIS.