

Sectoral Specialization of the Romanian Manufacturing Industry Reflected by Structural Changes Occurred after 2000

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Abstract

The paper presents structural changes that have occurred in the Romanian manufacturing industry over the last decade and a half, indicating trends more or less manifest of specialization or diversification of economic activities. Developments highlight slight increase, after 2007, of high-tech and medium-high sectors share, at the expense of those of low and medium-low technological level, a salutary specialization evolution but insufficient in relation with considerable demands of the Romanian economy modernization

Keywords: *structural changes; specialization; diversification; degree of specialization*

JEL Classification: *L16; O25*

Introduction

The broad and complex issue of Romanian manufacturing industry specialization must be addressed now and, especially, in the future, in a broader context, which presents both general and country specific elements, each of which having ambivalent effects.

The general components consist in the internationalization of economies and globalization - which opens opportunities but also generates considerable business potential threats to economies, industries and companies, especially for those in the less advanced countries -, as well as technological progress, particularly in the transport and communications which compresses space and time, on this basis intensifying global flows of human, goods and services, capital and information, but also contributing to the deepening gaps in productivity and development between countries.

The main elements of the general framework specific to Romania are:

- factor endowment, in which natural resources (obviously, only a part of those required by the overall economic development) provide to Romania a more consistent basis compared to other countries, including some neighbours which have significantly higher levels of development;
- the country's geo-strategic position at the crossroads between Europe and the Orient, whose advantages are insufficiently exploited in the absence of a clear vision on the orientation of foreign economic, trade and technology relationship;

- abrupt deindustrialization of the economy, a process that occurs in many countries, including developed ones, but that has particular connotations in Romania, consisting of: many privatizations fraudulent conduct; lack of clear direction of the process of economic reform and a coherent strategy for the overall development of the country; the closure of many companies become uncompetitive because of poor management, high production costs, poor quality of products and services; insufficient restructuring of the business in order to adapt supply to demand;
- majority or almost exclusive presence of transnational and multinational companies in all sectors of manufacturing industry, these companies being strong drivers of capital and technological, commercial, financial and managerial know-how, but, at the same time, entities pursuing profit maximization and application, through subsidiaries in Romania, of overall strategies set by the mother-societies—and which, while contributing to economic competitiveness growth, are not frequently connected to interests of Romanian industry development.

At the same time, structural changes occurred in the Romanian economy and industry after the transition to market economy model that accurately reflect the intensity of specialization, are determined, in turn, by the quality of the production factors the Romanian economy is endowed with. The quality of these factors determines, to a decisive extent, the success of the superior comparative advantages turning to account (caused by differences of physical factors endowment), and their transformation into competitive advantages, those which predominantly count today in international competition (due to differences in endowment of physical factors but, especially, new intangible factors - education, technology, management and organization). As outlined more than a decade ago by A. Iancu, “comparative advantage resulting from differences in factor endowment can be increased, supplemented or changed due to technological factors. Precisely due to massive intervention in the countries’ economy of technological factors influence on comparative advantage, in world trade appeared essential mutations.”¹

Technological progress is one that, in recent decades, has proven to be an essential factor shaping economies and industries profile, namely their specialization, and the mainspring of the development of international trade relations and their structuring in country-specific models.

In terms of generation, assimilation and dissemination of technological progress, Romania has great deficiencies that hamper considerably specializing in manufacturing industry in line with trends clearly stated in this respect in developed countries and those with rapidly growing revenue.

The negative differences Romania has compared to these countries with respect to capital / labour ratio, labour quality (the skill level, the spirit of the work, lifelong employment, etc.), the creative and innovative potential explain, in general, economic development gap that our country has comparatively with overwhelming majority of other European Union countries, and specifically, its characteristic model of industrial specialization that persists, in general, after two and a half decades of engagement by way of market economy.

Structural Changes in the Economy and Manufacturing Industry Since 2000

Romania’s deindustrialization process began immediately after 1989, being carried out, during the first decade of economic reform and transition to a market economy, with a special intensity, which made the share of the contribution of industry (mining and manufacturing, including Electricity, gas and water sector) to GDP to decline sharply from 46.2% in 1989 to 40.5% in

¹ A. Iancu. *Dezvoltarea intensivă și specializarea națiunilor*, Editura Economică, București, 2003, p. 293

1990 and 27.3% in 2000². In the same reference years, the share of manufacturing in total industrial production (i.e. including the other two mentioned components) decreased from 85.8% in 1990 to 79.4% in 2000³.

Reducing this share was made, predominantly, in favour of the tertiary sector, which was much undersized in centralized economy system and, after 1990, gradually increased its share as a result of a natural evolution to a market economy in the current period, which corresponds to the general trend of “tertiaryzation” of modern economies. The dramatic mentioned reductions cannot be explained, mainly, by this cause, but must be attributed, predominantly, to brutal deindustrialization caused by multiple factors, some mentioned above; evolution is all the more regrettable as the Romanian industry had a considerable production apparatus – that presented, frequently, a high degree of wear and tear but, with judicious investment, could be modernized – and human capital and technical expertise of medium and high level.

Share of civil employment in industry decreased, in the same reference period, from 38.1% in 1989 to 36.9% in 1990 to 23.2% in 2000; reductions are smaller in magnitude than those recorded by industrial output value, explanation consisting in maintaining, for the sake of social peace, over-staffing in many industrial units.

After 2000, during the period we delimited for conducting our research, structural changes that have occurred in manufacturing are reflected by figures shown in the following table.

Table 1. Structure of industrial production by activities of industry, 2000-2011

	2000 ^a	2005 ^a	2007 ^a	2011 ^b
Industry, total	100,0	100,0	100,0	100,0
Mining and quarrying	5,6	4,7	4,4	3,5
Manufacturing	79,4	80,6	80,6	76,0
Sector of Electrical and thermic energy, gas and water	15,0	14,7	15,0	20,5
Food and beverages	16,1	13,9	13,0	12,1
Tobacco products	1,5	1,4	1,2	0,6
Textile products	2,1	2,1	1,4	1,2
Clothing	3,3	3,3	2,6	2,3
Leather and footwear	1,3	1,5	1,2	1,2
Wood and products of wood (except furniture)	2,5	4,0	3,9	2,6
Pulp, paper and paper products	1,2	0,8	0,8	0,8
Publishing houses, polygraphy and reproduction of recorded media	1,3	1,4	1,5	0,8
Manufacture of coke and refined petroleum products	10,1	12,0	10,3	10,5
Chemicals and chemical products	7,0	4,8	4,4	3,7
Rubber and plastic products	1,7	2,5	3,0	3,6
Other non-metallic mineral products	3,3	3,2	4,0	2,6
Basic metals	11,4	9,3	9,3	7,7
Fabricated metal products	2,5	3,3	4,4	3,7
Machinery and equipment (except electrical and optical equipment)	3,6	3,1	3,1	3,0
Computers and office means	0,2	0,3	0,4	2,7 ^c
Electrical equipment	1,9	2,6	3,5	2,7
Radio, TV and communication equipment	0,7	0,4	0,8	- ^d
Medical, precision, optical, watchmaking instruments and apparatus	0,4	0,5	0,5	- ^e

²Romanian Statistical Yearbook issues 1995 and 2003, NSC, Bucharest, 1996 and, respectively, 2004, pp. 360-361 and, respectively, Table 4.1.

³Romanian Statistical Yearbook 2004, NSI, Bucharest, 2005, Table 6.1.2.

Table 1 (cont.)

Motor vehicles	2,5	4,6	5,1	9,6
Other transport equipment	1,9	2,0	2,3	1,4
Furniture and other manufacturing activities	2,3	2,5	2,5	2,2
Waste recovering	0,6	1,1	1,4	2,5 ^f
Repair, maintenance and installation of machinery and equipment	-	-	-	1,0

Note: a – Activities CAEN Rev. 1; b – Activities CAEN Rev. 2; c – - Together with Radios, TV and communications equipment and Medical, precision, optical and watchmaking apparatus and instruments; d – Together with IT and office means and Medical, precision, optical and watchmaking apparatus and instruments; e – Together with IT and office means and Medical, precision, optical and watchmaking apparatus and instruments; f – Together with water supply, sewerage, waste management and decontamination activities

Source: for 2000, Romanian Statistical Yearbook 2005, NCS, Bucharest, 2006, Table 6.1.2.; for 2005 and 2007 – Romanian Statistical Yearbook 2009, NSI, Bucharest, 2010, Table 16.2.; for 2011 – INSSE Tempo Home, IND103E

Structural changes in the Romanian economy and industry recorded since 2000 occurred during a period covering three distinct sub-periods, their influence on the evolution pattern of the entities mentioned being but not very marked: modest growth at the outset and then more consistent between 2000 and 2008; experience of the global crisis, between 2009 and 2010; economic recovery since 2011.

The succession of these distinct sub-periods did not influence the manifestation of trends begun in 1990 and continued after 2000, namely: permanent reduction of the weight of the Industry (Mining and quarrying, and Manufacturing) contribution to GDP; reduction between 2000-2011 of the Mining and quarrying share in overall Industry with 37.5% and of Manufacturing with 4.3% in favour of the Electricity, gas and water sector, whose share increased by 36, 7% in the same period.

The Influence of Structural Changes on the Manufacturing Sectors Specialization

About sectoral structural changes, those pointing out the sectoral specialization trends existing for a long time or new asserted during the mentioned period, are to be highlighted:

- registration by seven of the 23 sectors (CAEN activities) analysed a growth of their share, welcome development given that some of them are of high technology (IT and office means, Radio, TV and communication equipment, Medical, precision, optical and watchmaking apparatus and instruments, all but having a very modest share in 2000), and medium-high technology (Motor vehicles), according to the sectors' grouping depending on technological level made by OECD⁴; Motor vehicles sector increased its share in the value of manufacturing output, in the period 2000-2011, by 3.84 times, which allowed him to have a valuable contribution to the total value of Romania's exports and make up, thus, an industrial activity with a high degree of specialization;
- reducing the weight of 12 out of the 23 manufacturing sectors in manufacturing output value, mostly traditional, of medium-low and, predominantly, low-tech, with modest value-added; many of these sectors had had before 1990 and after a high share in Romania's export (Clothing, Leather and footwear, Wood and wood products, Metallurgy), which explains the features of high intensity in natural resources, energy and low-skilled labour of a large part of the goods exported and, therefore, relatively overall low efficiency of the export;

⁴ OECD. Revision of High-Technology Sector and Product Classification, Paris, 1997

- reducing the share of some sectors - Food and beverages, Manufacture of construction materials and other non-metallic mineral products - which have a good endowment of factors (natural resources, skilled labour) but insufficiently turned to account, resulting in significant loss of opportunities to cover increased domestic and, especially, international demand;
- considerable influence of foreign direct investment (FDI) on the significant increase of the share of some industrial sectors - Rubber and plastics, Motor vehicles -, and, implicitly, their contribution to exports, which highlights the ability of foreign investors to identify judiciously, with realism, sectors with good prospects for development based on existing capabilities they possess, materialized in a considerable productive and commercial potential;
- inability of some industrial sectors which, also, received substantial FDI, to maintain a relatively constant weight, although their contribution to export continued to be high – Clothing, Leather and footwear -, traditional, labour-intensive, with relatively modest contribution rate.

To see whether structural sectoral changes and industrial specialization directions are oriented to the “select” area of industrial development, of medium-high and high-tech, with high value added, we grouped the specific activities of manufacturing by technology levels, according to the OECD classification, and had as result the developments shown in the following figure.

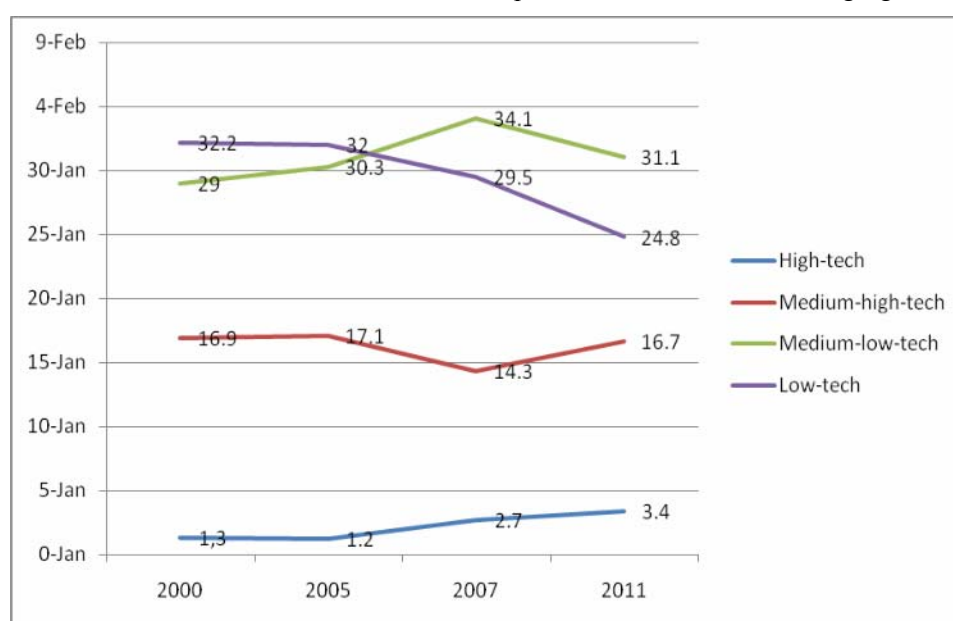


Fig.1. Manufacturing sectors' share in total industrial output value, by technological level, 2000 ... 2011

Source: Processing by the author of data from Romanian Statistical Yearbook issues 2005, 2009 and INSSE Tempo Home, IND103E

Structural changes highlighted by mentioned grouping present ambivalent aspects, some at odds with what is happening on this plan in most member countries of the European Union. Increasing the share of sectors of medium-high and high technology - both from 18.2% in 2000 to 20.1% in 2011 - is undoubtedly positive, but it is modest compared to the stringent requirements of Romanian industry structure modernization and progress registered in member countries, including the neighbouring former communist.

With regard to this last reference mark, it suffices to recall that, in 2005, so six years before 2011, the share of high-tech sectors was 6.3% in the Czech Republic, 5.2% in Poland and Slovakia, 18.2% in Hungary; first ranks in the hierarchy were occupied by Malta - 24.8% (irrelevant example, given the industry's share of this country), Finland - 22.4%, Hungary - already mentioned, Denmark - 16.8%, UK - 16.4%, France - 13.5% (EU25 - 11.4%). Gaps in this plan between Romania and other countries are considerable, and should be significantly reduced by unflinching investment, educational and institutional efforts.

Accordingly, the weights of sectors of low and medium-low tech fell between 2000-2011, by 3.0 percentage points and, respectively, 4.7 percentage points, decreases which, however, failed to remove the general characteristic of all average-tech level relatively modest of Romanian manufacturing.

Increase of overall average technological intensity of manufacturing sectors implies the existence of adequate skilled labour, the only one in measure to successfully cope with complex and particularly difficult requirements of assimilation and dissemination in all industrial activities of increasingly sophisticated and requesting technologies. In this plan, the situation is similar to that resulted from grouping industries according to technological level, meaning prevailing share of medium-low and low qualifications, as shown in the following figure.

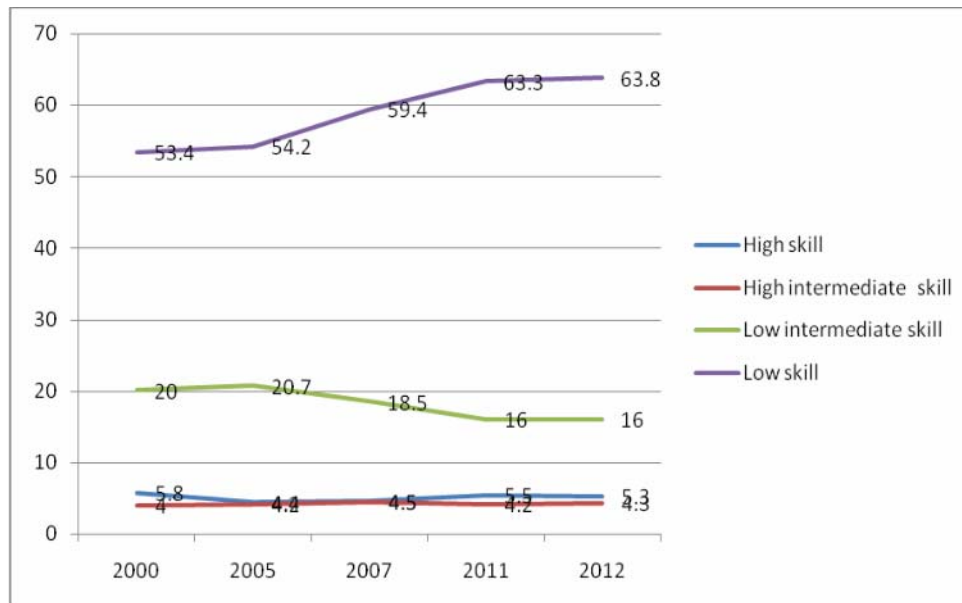


Fig. 2. The share of employment in manufacturing industries in the total workforce in the industry, by level of qualification, 2000 ... 2011

Source: Processing by the author of data regarding the number of employees by manufacturing sectors: for 2000, 2005 and 2007 – Romanian Statistical Yearbook issues 2005 and 2009, NIS, Bucharest, Table 3.1.11. and, respectively, Table 3.14.; for 2011 and 2012 – EUROSTAT, Employment by sex, age, and detailed economic activity (from 2008 onwards, NACE Rev. 2 two digit level -1000 (lfsq_egan22d)

If the weights of sectors groups characterized by high and high intermediate qualifications ranged, between 2000 and 2012, within restricted limits, but remained at modest levels compared to the EU average, the share of low intermediate skill group decreased by 4 percentage points in the mentioned period, and the share of low skill group increased by more than 10 percentage points, which is a real concern. It should be noted, however, that developments highlighted by the figures shown in the above figure must be treated with caution, whereas the share of manufacturing in total industry calculated on the basis of the analysed

variable varies significantly, and processed data source (Romanian Statistical Yearbook and EUROSTAT) also vary, which may mean that there are methodological differences in the calculation of the number of employees in each of the manufacturing industries.

With all circumspection with which we have seen the figures presented and approximations that they contain, the reality they reflect is obvious: the share of manufacturing sectors characterized by low intermediate and low qualifications in the total workforce employed in Romanian industry is very high compared to the situation in most member countries of the European Union, which is consistent with the assessment made with reference to the previous variable (the technological level of activities), that Romanian industry has overall level of technicality, and thus the necessary qualifications, much lower than that achieved in developed countries and sensibly outdistanced to the European average.

Conclusions

Summary analysis of structural changes occurred in the Romanian economy and manufacturing since 2000 enable the formulation of some relevant conclusions:

- The process of emphasized deindustrialization crossed by the Romanian economy in the last decade of the last century and continued with lower intensity after 2000, made the industry as a whole, with its three mentioned components, to lose a lot of weight (more than 20 percentage points) in favour of the tertiary sector, development registered also in developed countries, but which in Romania was heavily influenced by the aggravating circumstances set out above. Within the industry as a whole, its manufacturing component continued to reduce its weight after 2000, less than Mining and quarrying, reductions of these two components being made in favour of the third - the Electricity, gas and water sector;
- Changes of manufacturing sectors weights were varied, some sectors having constantly increasing weights, others constantly decreasing, and others fluctuating upward or downward depending on market demand, the circumstances, the domestic and, especially, foreign investment effort. Regardless of their scale, the changes did not modify the essential coordinates of Romanian manufacturing model, which means that areas where it was specialized before 1989 (recognized in international markets in terms of exports) were maintained, with some notable exceptions, making to keep, true attenuated, the old attributes of material-and energy-intensive industry, with generally modest technological level, and low capital - labour ratio;
- If before 1989 the Romanian industry could be considered, as a result of an aberrant autarkic economic policy, as very diversified (in terms of extremely broad list of industrial manufactured products, most inefficient and qualitative inferior), the transition to a market economy has imposed considerable efforts for specialization of all industrial manufacturing sectors in more limited nomenclatures, consistent with domestic and international market demand, as well the considerable increase in the products quality level. Specialization efforts in this regard are considerably facilitated by the presence of foreign capital in many sectors and its consistent contribution of technological, commercial, financial, organizational and managerial know-how, and strongly hampered by numerous adverse conditions - reduced creative and innovative domestic potential, lack of sufficient technical expertise, poor business environment fostering, migration of a large part of the labour force etc.;
- Dynamics of manufacturing sectors, indicating trends of specialization or their despecialization, occurred in beneficial directions - increasing the share of sectors of medium-high and high technology (Motor vehicles, IT and office means, Electrical machinery and equipment) -, marked decline in the share of some sectors which have obvious comparative advantages (Food and beverages, Manufacture of construction

- materials and other non-metallic mineral products, Other transport equipment), highlighted maintaining at high shares of some natural resources-intensive sectors, with quantitatively massive exports but extremely modest as value (e.g., Wood and products of wood);
- Accession of Romania to the European Union has not produced, in terms of structural dynamics of manufacturing, profound changes after 2007, which means that considerable opportunities offered by “inside” access to the European Single Market have not been fully exploited, these opportunities representing many areas and niches of expertise for Romanian producers, through inter- and intra-industry trade, integration into international value chains, employment in major European projects etc.;
 - Despecialization trends in some predominant traditional sectors, and progressive specialization in others with increasing technological level, determined by the processes of Romanian economy’s deindustrialization and globalization, can be properly stimulated and transformed into opportunities for progressively reindustrialization of country on new basis, qualitative superior, congruent with developments in recent years in developed economies. Adequate capitalization of these opportunities would mean removing, in a reasonable period, of material-intensity, energy-intensity and low technological level attributes that still have the Romanian industry.

References

1. Aiginger, K., Davies, St., Industrial specialization and geographic concentration – two sides of the same coin? Not for the European Union, *Journal of Applied Economics*, Vol. 12, 2004, pp. 231-248
2. Amiti, M., Specialization Patterns in Europe, *Review of World Economics* (Weltwirtschaftliches Archiv), vol. 135, no. 4, 1999, pp. 573-593.
3. Batista, C., Potin, J., *Stages of Diversification and Specialization in an Heckscher-Ohlin World*, 1976-2000, University of Oxford, Department of Economics Discussion Paper Series Number 356, 2007.
4. Brühlhart, M., Trading Places: Industrial Specialization in the EU, *Journal of Common Market Studies*, Vol. 36, No. 3, September 1998, pp. 319-346.
5. Carrere, C., Straus-Kahn, V. and Cabot, O, *Export Diversification: What’s behind the Hump?*, CERDI Working Papers 200724.
6. European Central Bank. *Sectoral Specialization in the EU. A Macroeconomic Perspective*. Occasional Paper Series No.19/July 2004.
7. Goschin, Z., Constantin, D., Roman, M. and Ileanu, B., *Regional specialization and Geographic Concentration of Industries in Romania*. The Bucharest Academy of Economic Studies, pp. 254-263.
8. Harrigan, J., Zapkrajšek, E., *Factor supplies and specialization in the World Economy*. NBER Working Paper Series, Working Paper 7848, Cambridge, MA02138, August 2000.
9. Hausmann, R., Klinger, B., *Structural Transformation and Patterns of Comparative Advantage in the Product Space*, Centre for International Development at Harvard University, Working Paper No. 128, 2006.
10. Helpman, E., Krugman, P., *Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition and the International Economy*, MIT Press, Cambridge, Massachusetts, 1985.
11. Imbs, J., Wacziarg, R., Stages of Diversification, *American Economic Review*, vol. 93, no. 1, 2003, pp. 63-86.
12. Kalemli-Ozcan, S., Sorensen, B. E. and Yosha, O., Risk sharing and industrial specialization: Regional and international evidence, *American Economic Review*, vol. 93, no. 3, 2003, pp. 903-918.
13. Lu, Z., *Industrial Specialization: Determinants, Processes and Consequences*, Universiteit Utrecht. Utrecht University School of Economics, A thesis submitted for the degree of Doctor of Philosophy at Utrecht University, November 2013.
14. Rodrik, D., *Specialization or diversification*, 16 May 2007. Dani Rodrik’s weblog. Available from:http://rodrik.typepad.com/dani_rodriks_weblog/2007/05/specialization_.html[2 March 2009]
15. UNIDO. *Industrial Development Report 2013. Sustaining Employment Growth: The Role of Manufacturing and Structural Change*. UNIDO ID/446, 2014.
16. Young, K. S., *Three Essays on Trade Specialization and Trade Costs*, George Washington University, MA, Dissertation, August 2011.