

ANALYSING ROMANIAN INDUSTRIAL COMPETITIVENESS REGARDING THE RECENT DYNAMICS OF THE INTERNATIONAL INDUSTRIAL TRADE BALANCE

Adrian Ioan Felea

The University of Oradea, Faculty of Economic Sciences, Oradea, Romania
adrianioan.felea@gmail.com

Abstract:

The industry remains the most important sector of the national economy, although in the other member states the services have a more important share of GDP. In this context, the level of industrial competitiveness is essential for the national competitiveness. This is a characteristic feature for Romania, where the industry has an important share in the GDP, in comparison with the other member states. The international trade balance is an important indicator for measuring the economic competitiveness, especially the industrial competitiveness. Our country has an obvious deficit regarding the international trade balance and thus the analysis of this subject is very relevant at a sectorial level and at national economy's branches level, when identifying solutions for raising the competitiveness. This paper is dedicated to studying Romania's industrial competitiveness analysis throughout the recent values of the imports and exports, generated by the industry and its branches. After identifying this concern utility, this article presents the methodology used, defining and experiencing the indicators proposed for characterising the level of industrial competitiveness and also the level and dynamic of the industrial trade. In the practical part of this paper, we presented the recent evolution of the values of imports and exports for the industrial products, the share of industrial sectors in the international trade balance, particularizing the manufacturing industry – the most important industrial sector – at branch level. In the analysis of the manufacturing industry we proposed a classifying methodology divided in six levels of competitiveness, associating and characterizing the branches. The conclusions present the possible solutions for improving the Romanian international industrial trade balance.

Keywords: competitiveness, trade balance, industry, indicators

JEL classification: F1, L6.

1. Introduction

When describing the national and regional competitiveness for characterizing the sectorial and industrial competitiveness, certain indicators may be used: independent indicators (simple), grouped in categories and aggregated in synthetic indicators. (Banica, 2009)

For grouping the industrial competitiveness indicators some of the following criteria may be used:

- Qualitative and quantitative aspects:
 - Subjective indicators;
 - Objective indicators
- According to their implications on competitiveness:
 - Direct impact indicators
 - Indirect impact indicators
- According to Time variable (t):
 - Static indicators

- Dynamic indicators;
- According to the complexity of analysis, the indicators that present an interest to the economic sectors:
 - Economic indicators;
 - Social indicators;
 - Indicators with a strong environment impact;
 - Indicators presenting the education level.

The appropriate indicators for evaluating the industrial competitiveness in the context of sustainable development, are the following (Felea, 2013):

- GDP (I_1);
- GDP annual growth rate (I_2)
- Employment rate (I_3);
- Work productivity (I_4);
- Exports (I_5);
- Total emissions of greenhouse gasses (I_6);
- Energetic intensity (I_7);
- Sustainable energy resources share in the total primary energy (I_8);
- Waste recycling performance (I_9);
- RDI/GDP Expenses (I_{10});
- Engineers and exact sciences specialists share (I_{11});
- Professional training degree at working place (Continuous learning) (I_{12})
- TIC training degree index (I_{13});
- Generated foreign direct investments (FDI) stock/ Received FDI stock (I_{14})

The majority of the indicators listed above are independent indicators [$I_1 - I_9$], the indicators [$I_{10} - I_{13}$] are input indicators and indicator I_{14} is a composed indicator with 2 components: input (received FDI stock) and output (generated FDI stock). All of the chosen indicators are appropriate for the static and dynamic description of the industrial competitiveness.

Similar to the EU, Romania hasn't got an official and unitary Industrial Development Strategy. In 2010 the Romanian Government representatives were announcing an official public debate of the document regarding our country's reindustrialisation process, a document based on GEA conducted study. In 2013, the actual Government announced its intention to frame and launch a new strategy called Romanian Reindustrialisation Strategy (RRS), but it only remained in this state.

Some general observations regarding the Romanian industry made by ASPES (Statistical and Socio - Economic Forecasting Association) emphasize the following:

- In the last 20 years, Romania went through a des - industrialisation process determined by the profound system crisis;
- In the last 20 years hundreds of thousands of jobs in the industrial sector were lost;
- Foreign capital represents nearly 80% of the turnover in the industrial sector – a progress factor not found in the international trade balance, that remains imbalanced;
- In the last 20 years Romania hasn't had any coherent industrial policy;
- Romanian economy is based on investments that do not insure the normal function of the production factors, natural resources and low cost workforce, and innovation has a lower role than the other competitive economies;
- On average, the industrial share of our country's GDP decreased every year with 1 %;

- The employment rate share in the Romanian industrial branches, except construction, decreased continuously since 1990 until now, the dismissed employees being assumed by the constructions and services sectors.

Another observation refers to the actual state of the Romanian economy and implicitly to its industry, the FDI are highly affected by the development degree of the transportation, communications and energetic infrastructure, that are not similar to the European level and do not ensure the normal economic activities (Berinde, 2006).

2. Working methodology:

For all the above listed indicators [$I_1 - I_{14}$] applied to the industrial competitiveness evaluation, we will calculate the momentary value and the evolution rate. The momentary value is calculated for one year, and by evaluating these values for several years we may evidence the time evolution of the indicators.

The time rate evolution of a certain indicator (I_j) will be calculated using one of the following relations:

$$i_j(t) = \frac{I_j(t) - I_{j0}}{I_{j0}} \times 100[\%], \text{ or } i_j(t) = \frac{I_j(t)}{I_{j0}} \times 100[\%], \quad j = \overline{1, 14} \quad (1)$$

$$i_j(t) = \frac{I_j(t) - I_{j0}}{I_{j0}} \times 100[\%], \text{ or } i_j(t) = \frac{I_j(t)}{I_{j0}} \times 100[\%], \quad j = \overline{1, 14} \quad (1)$$

where,

$I_j(t)$ - represents the value of I_j at the evaluation moment (t);

I_{j0} - represents the value of I_j at the reference moment (t_0).

The exports (I_5) may be determined as shares in GDP, at national level, sector (k) level or branch (r) level. So:

PIB_k^E - sector exports „ k ”[UM];

PIB_{kr}^E - branch exports „ r ” in sector „ k ”[UM];

UM- monetary units (€, \$, lei).

The relative values of the two indicators may be calculated relatively to the total values as:

$$pib_k^E = \frac{PIB_k^E}{PIB_k}; \quad pib_{kr}^E = \frac{PIB_{kr}^E}{PIB_{kr}} \quad (2)$$

PIB_k, PIB_{kr} – GDP value at sector (k) level and branch (r) of sector (k).

If there is a possibility of defining the human resources related to sector exports ($POPO_k^E$) and branch export ($POPO_{kr}^E$), then we may calculate the specific value and also the indicators “work productivity” and the “employment rate” referring to exports, using specific calculation relations (Felea, 2013). With reference to indicators (PIB_k^E, PIB_{kr}^E) and their relative value we may calculate the evolution rate, using relation (1). The indicators listed above allow the identification of the actual state (momentary state) of the sector and branch exports, in the European context.

$POPO_k^E$ - employed population in sector „ k ”;

$POPO_{kr}^E$ - employed population in branch “ r ” of sector „ k ”;

In order that the results obtained from evaluating indicators “ I_5 ” to be relevant for constructing the aggregated indicators (IA), the following problems need to be solved (European Innovation Scoreboard, 2004):

- Establishing the weighting schemes;
- Standardizing the measuring units (UM);
- Establishing the rules for using data for extreme values.

The most frequent applied models for evaluating IA (Barro, R.J. ,1996) start from the following basis relations:

$$IA_i^t = \frac{\sum_{j=1}^m p_j y_{ij}^t}{\sum_{j=1}^m p_j} \quad (3)$$

where,

i- The analysed entity (country, region);

j- The simple indicator used for the aggregated (composed) indicator relation (productivity, employment, etc);

t- The moment of the analysis (t);

p_j- The allocated share for indicator (j);

y_{ij}^t- The transformed value of indicator (j), for entity (i) in year (t);

m- number of simple indicators that compose IA

For calculating the value of y_{ij}^t, and starting from the real value (x_{ij}^t) of indicator (j), there are several models obtained (**Bănică, 2009**):

$$y_{ij}^t = \frac{x_{ij}^t}{m_j^t} \quad (4)$$

m_j^t- Average of x_{ij}^t values for the (m) entities;

Using relation (4) we obtain a certain model sensitive to the positive values.

In order to balance the model's sensitivity in relation to the extremes (positive, negative), the following relation is used:

$$y_{ij}^t = \frac{x_{ij}^t - m_j^t}{\sigma_j^t} \quad (5)$$

σ_j^t- the scattering of (x_{ij}^t)

Another formula frequently applied is:

$$y_{ij}^t = \frac{x_{ij}^t - \min(x_{ij}^t)}{\max(x_{ij}^t) - \min(x_{ij}^t)} \quad (6)$$

where,

min(x_{ij}^t)- is the minimal value from string values (x_{ij}^t) with i=1, n and (j, t)- constants;

max(x_{ij}^t)- is the highest value from the string values (x_{ij}^t) with i=1, n and (j, t)-constants;

Applying relation (6) leads to reducing the sensitivity to the extremes.

After evaluating and / or collecting the data for Romanian industry imports and exports, and for its sections and branches, we will proceed to the graphical presentation of the momentary values and of the indicators time evolution values. The Romanian industrial sector competitiveness description and presentation from the international trade point of view will be obtained using the comparison method, as follows:

- Import – Export comparison, calculating the international trade balance for industrial products;
- The comparison between different industrial sections;
- The comparison between the manufacturing industry branches;

The comparison will make reference to the same type of indicator (simple, evolution rate) for a certain year as an average for a period or as a time evolution. For emphasizing the trend, forecasting the Romanian manufacturing industry branches competitiveness we will describe and rank them according to the values of the international trade balance.

3. Synthesis of the obtained results

The international trade balance is an important indicator for describing the economic competitiveness, especially the industrial competitiveness. Figure 1 presents the Romanian industrial products imports and exports value evolution

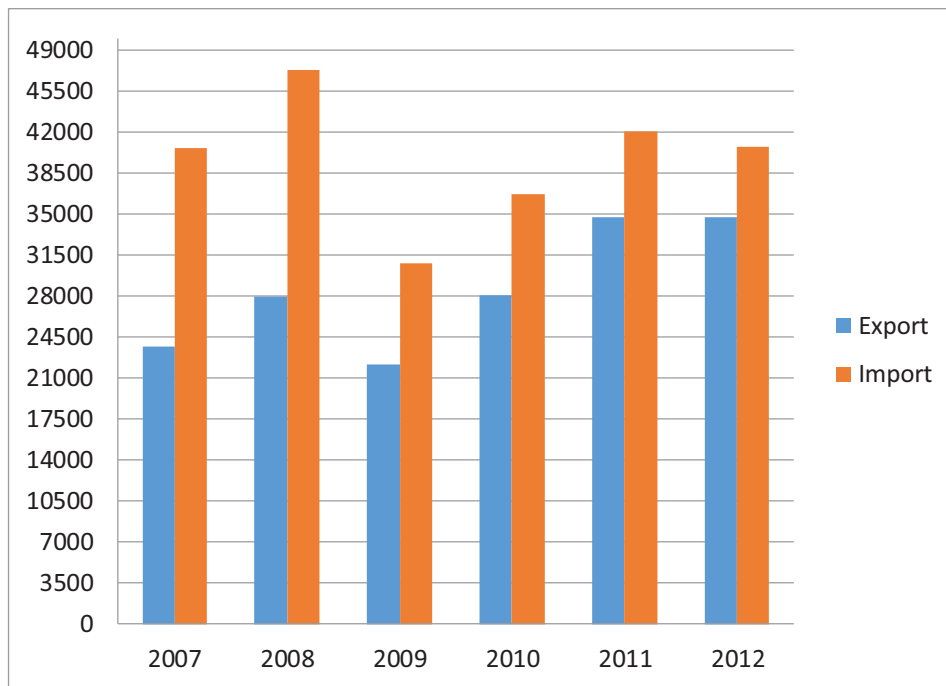


Figure 1: Romanian industrial products exports and imports evolution [mil EURO]
Source: Authors calculation based on INS statistical data

Analysing this evolution we can draw several conclusions. Firstly, we may notice that the exports level is lower than the imports level, on the whole period taken in consideration, which is not a very comforting situation for the industrial sector and for the Romanian economy. We may also see clearly the important effect of the economic and financial crisis in Romania, starting from the year 2008. In 2008, Romania registered the highest level of industrial products imports, and this value hasn't been reached since. With reference to the exports value, they have constantly been growing since 2009.

Table 1 presents the international trade balance (BCI) calculated as a percentage ratio between the value of exports and the value of imports:

Tabel 1: Romanian industrial products trade balance evolution:

Year	2007	2008	2009	2010	2011	2012
BCI[%]	58,4	59,1	72,2	76,3	82,6	85,3

Source: Authors calculation based on the statistical data published by INS

Based on BCI values (Table 1) we calculated and graphically represented the evolution rate of this indicator.

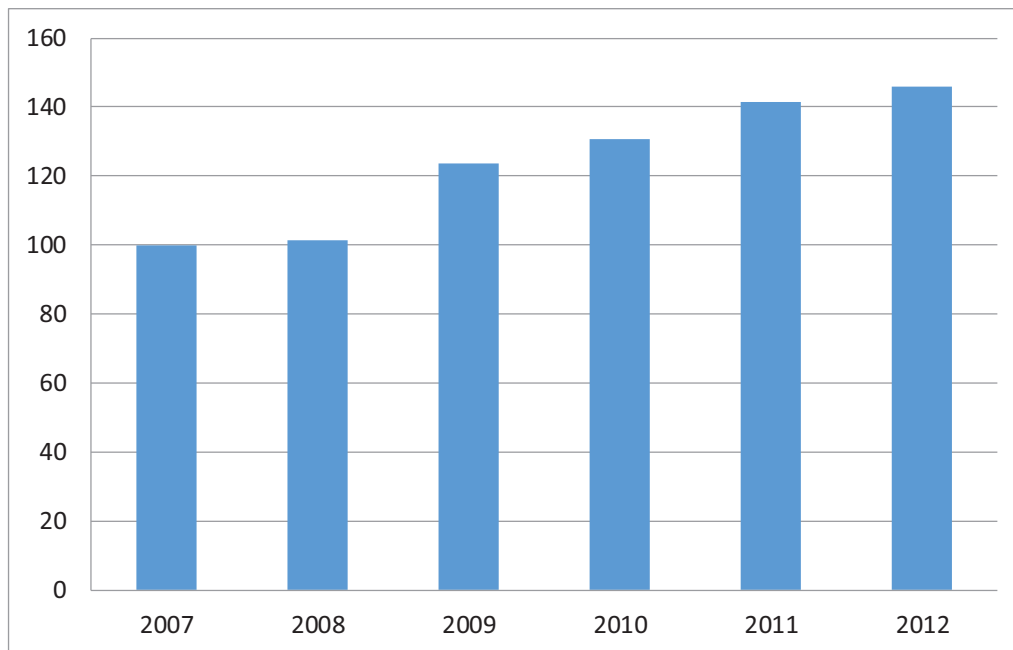


Figure 2: Romanian industrial products trade balance evolution rate

Source: Authors calculation based on the data published by INS

The above figure presents the industrial products trade balance evolution between 2007 and 2012 in Romania. We can notice that in the analysed period the exports and imports ratio for Romanian industrial products raised. This means that the exports value appreciated compared to the imports value. In other words, the Romanian industrial competitiveness increased.

We may also study and emphasize the industrial subsectors share in the Romanian industrial products trade balance. Using the information and data published by INS we analysed the industrial subsectors from the trade balance point of view and considered relevant only the ones totalizing at least 500 mil euro in ten months. The relevant IE subsector is "fuel" (oil and gas) and another 18 IP subsectors – the highest share of the Romanian trade balance.

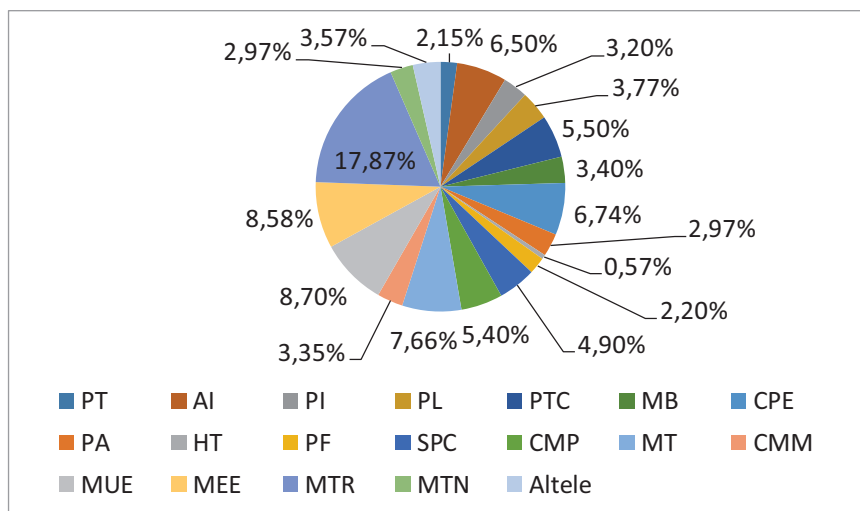
Table 2: Industrial sectors share in the Romanian trade balance [%]

Industrial sector Capital circulation sense of movement	Mining industry	Manufacturing industry	Thermic and energetic industry
Export	0,4	99,3	0,3
Import	10	89,7	0,3

Source: Authors calculation based on the data published by INS

The numbers show us an important trade imbalance of the industrial subsector "fuel", the trade balance share is 1%, the value of the imports is higher than the value of the exports. Referring to the 18 subsectors of IP, we ranked them according to the imports and exports share. Figure 3 presents this information.

a)Export



b) Import

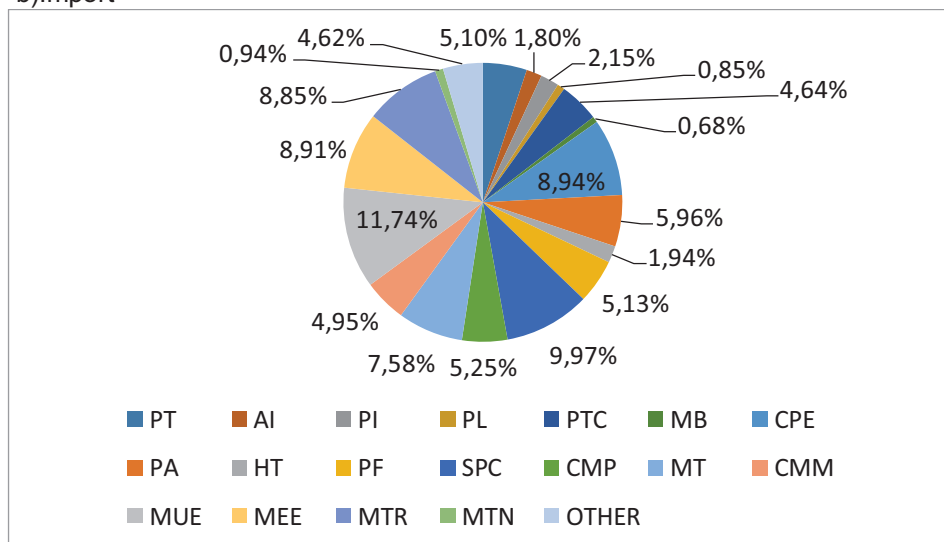


Figure 3: Ranking IP subsectors according to their share in the international trade balance
Source: Authors calculation based on the statistical information published by INS

Based on the values obtained for the international trade with industrial products there have been calculated the values for indicator BCI for all 18 subsectors of IP. This article proposes the classification of the subsectors (R-IP) in the following categories:

Excellence R-IP – those branches /subsectors with BCI at least three times higher than the general industry BCI value;

Very good R-IP – with normal BCI values between $[2 \div 3]$ or the general BCI value;

Good R-IP – with BCI value $[100\%; \text{industry } 2\text{BCI}]$;

Satisfying R-IP- with BCI $[\text{industry BCI}; 100\%]$;

Low R-IP – with BCI $[1/2 \text{ industry BCI and industry BCI}]$;

Very low R-IP – with BCI $\leq 1/2 \text{ industry BCI}$.

Table 3 classifies the 18 R –IP based on the results obtained in 2012.

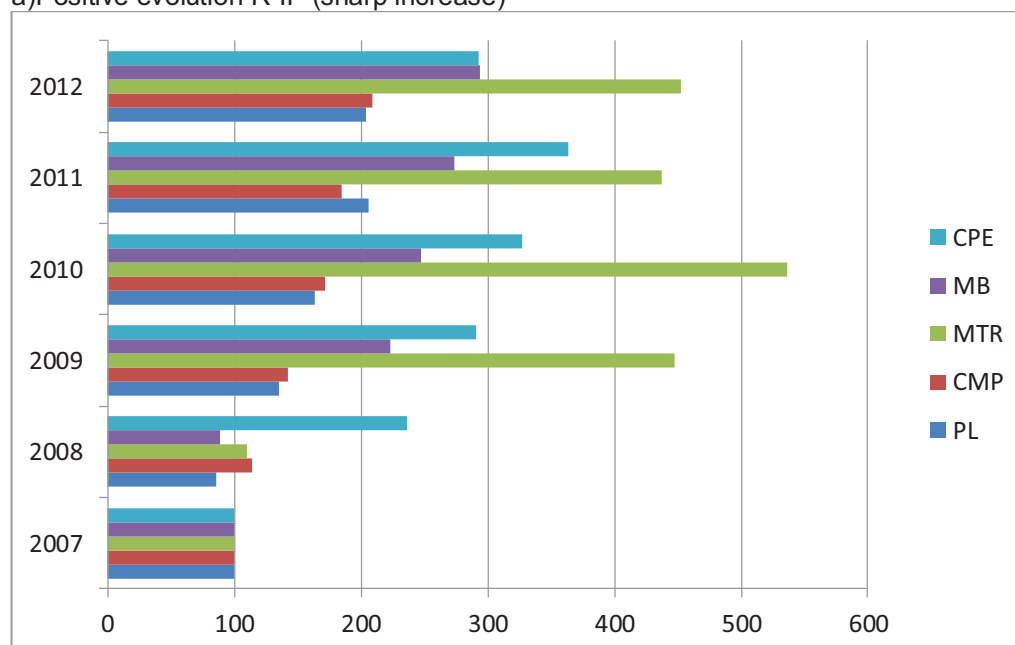
Table 3: Classifying and ranking the most important branches / subsectors of Romanian IP, based on the results obtained in 2012

Category	R-IP	BCI value in 2012
Excellence R-IP	1.MB	426
	2.PL	378
	3.AI	308
	4.MTN	269
Very good R-IP	5.MTR	172
Good R-IP	6.PI	129
	7.PTC	101
Satisfying R-IP	8.CMP	87,7
	9.MT	86,2
Low R-IP	10.MEE	82,2
	11.CPE	64,4
	12.MUE	63,3
	13.CMM	57,7
Very low R-IP	14.PA	42,5
	15.SPC	42
	16.PF	36,6
	17.PT	35,8
	18.HT	25

Source: Authors calculation based on data and information published by INS

Another important aspect in the analysis process of R-IP is their recent dynamics. According to the normal BCI value some R-IP have had a positive evolution, and unfortunately other R-IP have had a negative evolution (Figure 4).

a)Positive evolution R-IP (sharp increase)



b) Negative evolution R-IP (sharp decrease)

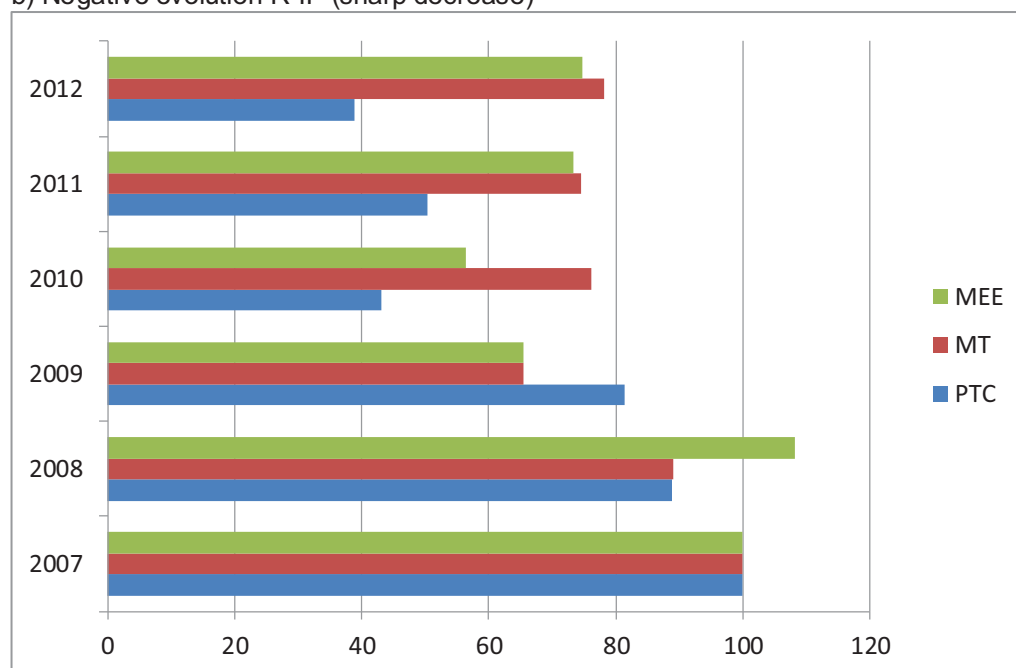


Figure 4: BCI evolution rate for R-IP with recent dynamics [%]

Source: Authors calculation based on the data and information published by INS

4. Conclusion:

The recent trade balance for Romanian industrial products has an increasing trend, meaning that the value of exports is higher than the value of the imports for industrial products. The exports are made almost exclusively (99.3%) out of IP products. The “fuel” subsector generates a strong trading imbalance for the energetic industry.

Regarding the exports value, the main IP subsectors are ranked as follows: road transport (17,87%; equipments and machinery (exclusively electrical and optical equipments) (8,7%) and machinery, equipments and electric apparell (8,58%).

The most important IP subsectors from the imports value point of view are the following: equipments and machinery (exclusively electrical and optical equipments) (11,74%); chemical substances and products (9,97%), and computers, electronics and optical products (8,94%).

IP subsectors can be divided according to BCI as follows:

- Excellent : MB, PL, AÎ, MTN;
- Very good: „MTR”;
- Good: PI, PTC.

The other IP subsectors may be considered uncompetitive.

According to the recent values and dynamics of BCI, the most important recommendation for our country is to try and develop the following IP subsectors: MB, PL, AI, MTN, MTR, PI, PTC, CMP and CPE;

References

- Bănică (Dinică), G. A. (2009) - Resursele umane și competitivitatea regională, teză de doctorat, Academia de Studii Economice, Școala doctorală, Facultatea de cibernetică, statistică și informatică, Economica, București
- Felea, Adrian Ioan; (2013), Raportul III, „Cercetări comparative privind competitivitatea economică a României”, Oradea
- Berinde, Mihai, (2006), Rolul concurenței în creșterea competitivității, The Journal of the Faculty of Economics, vol I, pag 35-50
- http://www.gea.org.ro/documente/ro/studii/studiu_reindustrializarea_ro_bostina_ok.pdf, 2010
- European Innovation Scoreboard, 2004, disponibil la link <http://arno.unimaas.nl/show.cgi?fid=15494>