

Romanian Oil Industry Decline

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Abstract

The oil industry, seen from the point of view of both extraction and processing is one of the most important and oldest Romanian industries. Experience of over a century and a half in this field places Romania on a leading position both in terms of achievements and of well-trained personnel, recognized and sought after all over the world. Unfortunately, the years after 1989 affected the oil industry within the comprehensive economic restructuring program. Changes aimed at reducing activity and at structural modifications. Thus many units of production and processing were closed and massive privatizations took place. And as it was not enough, the financial and economic crisis that started in late 2008 emphasizes the decline in the industry that was once the pride of Romanian industry.

The paper presents the main aspects of the evolution of the Romanian oil industry since 1990, focusing on the period from 2000 to 2013 and on the effects of global economic crisis.

Keywords: *decline; economic crisis; oil industry; restructuring; environmental issues*

JEL Classification: *L71*

Introduction

The oil industry is one of the key fields of the global economy, virtually representing its engine of development. Therefore global concerns on developments in this area are significant in technical, economic and financial terms.

Topic is vast and has always been present and of great interest, therefore during our research activity we approached it on several occasions, both in terms of statistical and economic indicators as well as in statistical analysis, in various publications especially in the specialized magazine *Oil & Gas Journal* (No. 2/2000, no.6/2000, no.3/4/2006).

Seen both from the point of view of extraction and processing, the oil industry is part of the ancient and renowned activities in Romania. Although oil is known for over two thousand years, its widespread exploitation began only in the nineteenth century. Romania was the pioneer in this field, with the setting up of the first refinery in the world in 1857 in Ploiesti, by

Mehedinteanu¹ brothers. Also, it was the first officially recorded country in the international oil production statistics, 275 tonnes that year. It was only in 1859 the United States of America followed it, Italy in 1860, Canada in 1862 and Russia in 1863. Also Bucharest was the first oil lit city in the world.

In 1904, the first school of drillers was founded in Campina, and in 1937 Romania occupied the 7th place in the world after the USSR, USA, Iraq, Iran, Venezuela and the Dutch East Indies in terms of world reserves.

The Romanian list of achievements in the oil domain could continue with the renowned refineries Concordia (Vega Ploiesti), Steaua Română Câmpina, Astra Ploiesti, Brazi Factories, Teleajen (Lukoil) and so on, with many patents and inventions that apply worldwide and prestigious achievements of Romanian petroleum engineers all over the world.

Unfortunately post-revolutionary period marked the decline of this renowned industry. Profound restructuring of the economy on one hand determined by the transition from a planned economy to a market one and on the other hand framing the requirements demanded by European Union integration, have negatively affected all economic activity. In addition, the increasing indebtedness of the country by various international bodies generated, in addition to positive effects, many negative effects.

Enterprises were restructured, privatized and abolished, so the structure of the Romanian economy has changed radically, becoming from a producing and exporting country a consuming and importing country.

In this paper, we analyse the decline of the oil industry in Romania using methods and techniques specific to the theoretical statistics² and economic statistics³, relative measures, average measures, time series indicators, graphics, statistical and economic indicators.

The analysis took into account the period after 1990, focusing specifically on 2000-2013, for several reasons.

The first reason is related to the comparability of data. Changes of NACE classification (1992, 1997, 2003 and 2008) significantly affected the structure of activities and thus hampered, for some indicators, the comparative analysis for long periods.

Another consideration is related to the desire to highlight the effects arising from the global financial and economic crisis in late 2008.

Analysis of the indicators used to highlight the evolution of the oil industry considered the nomenclature NACE Rev. 2 (which applied from January 1st, 2008), for the following activities at the division level (according to the degree of detailing of the indicators in official statistical publications):

- For the extraction: Extraction of crude petroleum and natural gas;
- For the processing: Manufacture of coke and refined petroleum products.

Compared to the old classification NACE Rev. 1, there are many differences in the activities that are comprised or not in the divisions mentioned, and made impossible to analyse on longer periods. Therefore, in this paper, this was done only for the indicators found in the comparable form.

¹ Ministry of Economy and Finances, 2007, Conferinta internatională "150 de ani de petrol in Romania – Traditia Evolutiei" sub patronajul Ministerului Economiei si Finantelor, available on: <http://www.150deanidepetrol.ro/scurt-istoric.html> [accessed on 27 October 2015]

² Anghelache, C., *Tratat de statistică teoretică si economică*, Economic Publishing House, Bucharest, 2008, p. 85

³ Lazăr M., Lazăr C., *Analiză statistico-economică*, Anghelache, C., *Tratat de statistică teoretică si economică*, Economic Publishing House, Bucharest, 2012, p.19, p. 98.

Significant Reduction of Labour Force in the Oil Field

The extensive restructuring of the Romanian economy after 1989 resulted in a drastic reduction of the number of employees in all fields. Thus, in 2013 the average number of employees in the total economy amounted to about 50% of the 1990 level. But much more dramatic reductions occurred in industry, where the reduction was nearly 70%.

In the general context of the labour force reduction, the two sectors of the petroleum industry (extraction and processing) were also affected. Thus, in the extraction of crude oil and natural gas for the specified period, the reduction was about 70% and in the manufacturing of coke and refined petroleum products it was of over 85%.

The average annual decrease of the number of employees from 1990 to 2000 in crude oil and natural gas extraction was of -1.5% and since 2000 until 2013, it was almost 4 times bigger (-6.1%). Nearly the same situation, of the average annual decrease is noted for the manufacture of coke and refined petroleum products. In this case, if the first time reduction was an average of 3.8% per year in the second period the average decrease is of 12.0% per year.

The downward trend in employment in the oil industry continues and it is increasing even more after 2008, by the end of which the global financial and economic crisis was triggered. This resulted in a compression of global economic activity, and in the case of Romania, the negative effects were more evident.

For industry, the analysis on the period 1990 - 2013 has certainly a guidance character, because of different levels of aggregation according to CAEN classification, but the differences were quite small (a few percent) could not obviously influence the presented dynamics. For more accuracy, as previously mentioned, the data will be analysed over the period after 2000 that exacerbated more the downward trend in employment in the oil industry.

Thus, the average number of employees in crude oil and natural gas extraction in 2013 reached only 21.8 thousand people compared to 46.3 thousand in 2000 (-53.0%), and for manufacturing of coke and refined petroleum products just 4.5 thousand persons, compared to 21 thousand persons (-78.4%), as it's seen in Table 1.

Table 1. The dynamics of average number of employees in the oil industry in the period 2000 - 2013

Year	Extraction of crude petroleum and natural gas		Manufacture of coke and refined petroleum products	
	Average number of employees (thousand pers.)	Dynamic (%) (2000=100)	Average number of employees (thousand pers.)	Dynamic (%) (2000=100)
2000	46.3	100.0	21.0	100.0
2001	46.5	100.5	20.9	99.2
2002	46.5	100.5	17.0	80.8
2003	45.1	97.4	14.7	70.0
2004	44.2	95.4	14.2	67.4
2005	44.9	97.0	13.4	63.5
2006	38.0	82.1	12.0	57.0
2007	33.8	72.9	11.2	53.3
2008	29.5	63.7	10.1	48.2
2009	26.9	58.1	7.6	36.3
2010	25.4	54.8	6.3	30.2
2011	23.5	50.8	6.1	28.9
2012	23.0	49.6	5.2	24.8
2013	21.8	47.0	4.5	21.6

Source: Calculations and information based on data from the Romanian Statistical Yearbook, edition 2011 and 2013, TEMPO database on-line, National Institute of Statistics Bucharest

The faster reduction in the number of employees in the two analysed sectors is clearly distinguished in the graphical presentation (Figure 1).

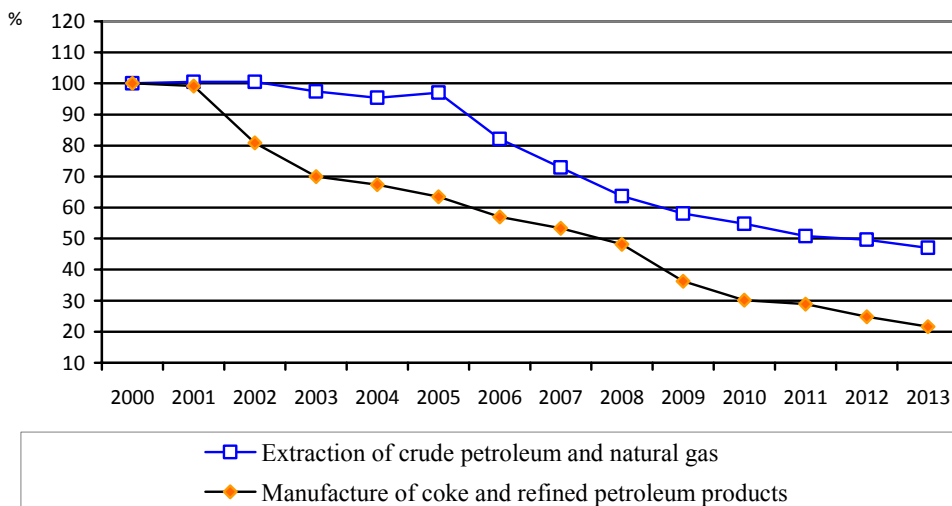


Fig. 1. Dynamics of average number of employees in the oil industry in the period 2000 - 2013 (year 2000=100)

Source: Calculations and information based on data from the Romanian Statistical Yearbook edition 2010 and 2013, TEMPO database on-line, National Institute of Statistics Bucharest

The tendency to decrease throughout the period is of course more pronounced for the manufacturing sector, compared with the extraction sector.

Comparing the two sectors, the extraction and processing, we also find that the years that have triggered evident changes of pace were, 2002 for processing and 2006 for extraction.

The Oil Industry Decline through the Evolution of Statistical and Economic Indicators

In 2013, over than 50% of primary energy resources in Romania were represented by natural gas (29.4%) and oil (25.8%). Of the total resources of natural gas, about 75% come from domestic production and 25.0% of imports and in the case of crude oil, about 40% of production and 60% of imports.

The decrease of the activity in the oil field after 1990 meant not only severe reductions of personal but also the reduction of activity by half (Figure 2).

Thus, from a crude oil production of 6,696 tonnes of oil equivalent (toe) in 1992, in 2013 it decrease to only 4,028 toe (-39.8%) and natural gas production fell from 17,336 toe to 8,687 toe (49.9%).

However, the fact that Romania still has its own energy resources makes its energy dependence relatively small (less than 25%) compared to other European countries, which is below the average energy dependence recorded at EU27 (50%).

Moreover, Romania ranks 3th in the European Union (EU 28) in terms of a significant share of natural gas production in total energy production, after the Netherlands and Croatia and for the

share of crude oil production in total energy production, ranks 4th, after Denmark, United Kingdom and Croatia⁴.

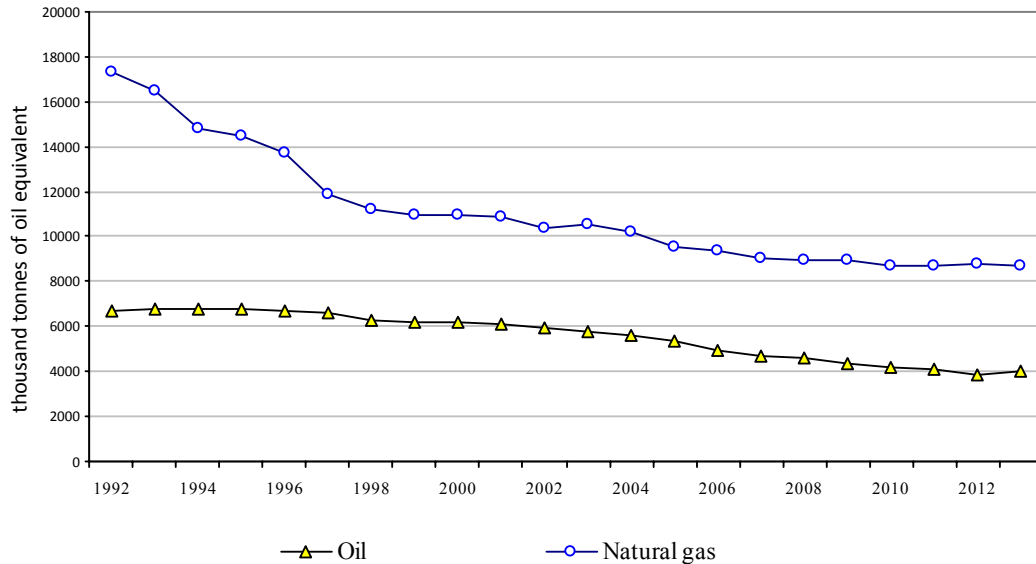


Fig. 2. Evolution of natural gas and oil production during the period 1992 - 2013

Source: Calculations and information based on data from the Romanian Statistical Yearbook edition 2010 and 2013, National Institute of Statistics Bucharest

As we mentioned above, a part of primary energy resources are provided from imports, both for gas and especially for crude oil. Unlike production that showed a continuous declining trend, gas and crude oil imports had a fluctuating trend and after 2000 until 2006 the trend was sustained, especially after 2008, the triggering of the financial crisis led to a decrease (Figure 3).

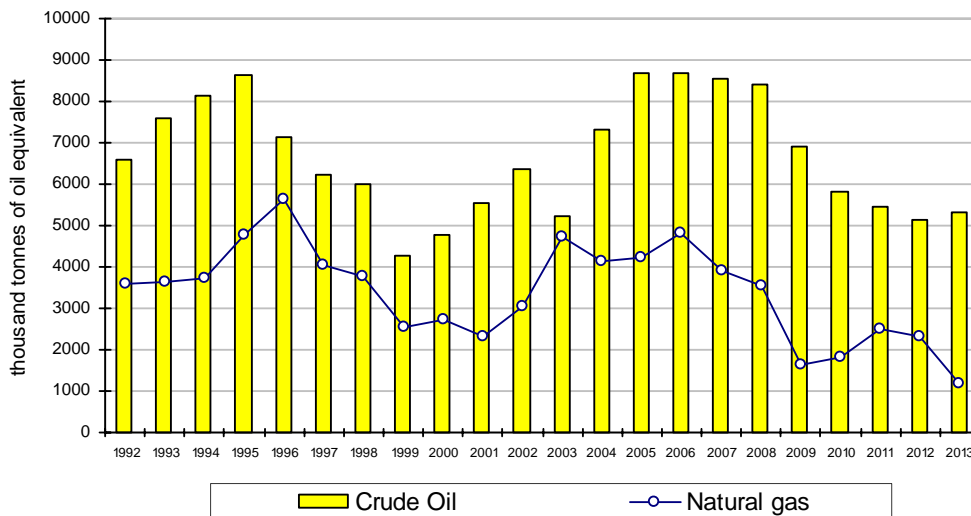


Fig. 3. Evolution of natural gas and crude oil imports in the period 1992-2013

Source: Calculations and information based on data from the Romanian Statistical Yearbook edition 2010 and 2013, National Institute of Statistics Bucharest

⁴EUROSTAT, Statistics explained—Energy production and imports, available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_production_and_imports, [accessed on 6 February 2016]

In terms of value, compared with imports, after 2008, in the oil industry (both extraction and processing) the export value is about two times smaller, a negative balance being consistently recorded.

Also in terms of value, the industrial oil production in 2013 added up 46 billion lei, of which 6.6 billion in crude oil and natural gas and 39.4 billion in the manufacture of coke and refined petroleum products.

The share of industrial output in the oil industry in 2013 represented less over 10% in total industry output.

Analysing only the period 2008-2013 due to problems of comparability, we find that, as in the physical production case, the industrial oil production, registered a pronounced negative trend (Figure 4).

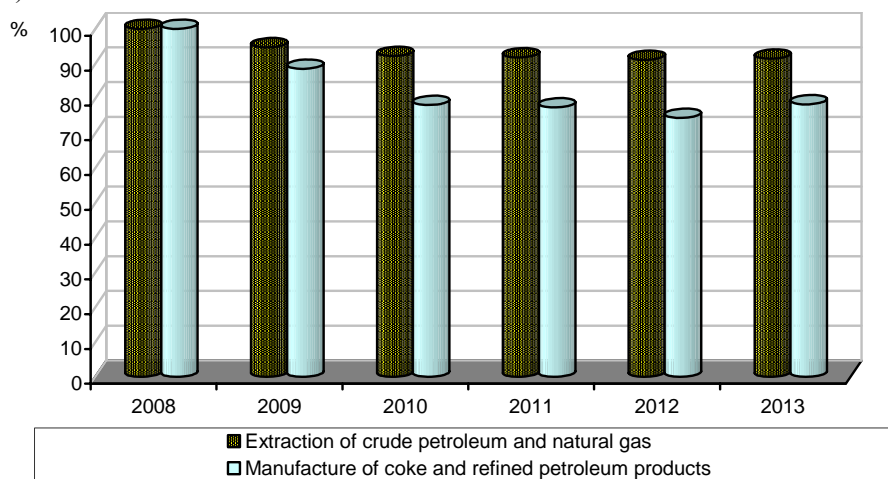


Fig. 4. Dynamics of the industrial oil production during 2008-2013 (2008 = 100)

Source: Calculations and information based on data from the Romanian Statistical Yearbook edition 2013, National Institute of Statistics Bucharest

The negative trends was registered especially in the processing, where the reduction is more than 20% and in the extraction sector, the reduction is almost 10%.

Correlating the dynamics of the industrial oil production with the average number of employees, although both had negative trends after 2008, a positive trend in labour productivity was resulted. This was because the pace of decline in industrial production was slower than the average number of employees (Table 2).

Table 2. The dynamics of industrial production, average number of employees and labour productivity in the oil industry during 2008 - 2013 (%)

Indicators	Dynamic (2008=100)				
	2009	2010	2011	2012	2013
Extraction of crude petroleum and natural gas					
- industrial production	94.7	92.2	91.8	91.1	91.4
- average number of employees	91.3	86.0	79.7	77.9	73.7
- labour productivity per employee	103.7	107.2	115.2	116.9	124.0
Manufacture of coke and refined petroleum products					
- industrial production	88.5	78.1	77.4	74.4	78.3
- average number of employees	75.4	62.7	59.9	51.4	44.8
- labour productivity per employee	117.4	124.6	129.2	143.9	174.8

Source: Calculations and information based on data from the Romanian Statistical Yearbook edition 2013, TEMPO database on-line, National Institute of Statistics Bucharest

From the data presented in Table 2 we notice an increase in productivity per employee of 24% in 2013 compared with 2008, in crude oil and natural gas extraction and over than 74% of manufacturing of coke products and products obtained from the processing oil.

Although the period 2008 - 2013 has been one of decline for most indicators of the oil industry, a significant increase in labour productivity has allowed a growth of the average net nominal earnings by nearly 38.6% in crude oil and natural gas extraction and 46.7% in manufacturing of coke and refined petroleum products (Table 3). In real terms however, the growth of the average net wage is only 8.9% in the extraction and 9% in processing.

Table 3. Dynamics of average net monthly earnings in the oil industry during 2008 - 2013 (%)

Indicators	Dynamic (2008=100)				
	2009	2010	2011	2012	2013
Extraction of crude petroleum and natural gas					
- nominal dynamic	103.1	100.6	112.2	128.1	138.6
- real dynamic*	97.6	89.8	94.6	104.6	108.9
Manufacture of coke and refined petroleum products					
- nominal dynamic	110.9	129.1	129.9	133.8	146.7
- real dynamic*	105.0	115.2	109.6	109.3	115.2

Source: Calculations and information based on data from the Romanian Statistical Yearbook edition 2013 TEMPO database on-line, National Institute of Statistics Bucharest

* Real dynamic was determined based on the average annual consumer index prices calculated by INS Bucharest.

Obviously, a faster positive dynamics of labour productivity in the manufacturing sector has enabled a more substantial salary increase compared to the extraction.

In 2013 the net nominal average wage reached 3,945 lei in crude oil and natural gas extraction and 3,378 lei in manufacturing of coke and refined petroleum products, its level being 2 times higher than the wage on total economy or total industry. Moreover, the oil industry is among the industrial activities with the highest earnings.

Conclusions

The oil industry in Romania, as well as all over the world, is one of the most important sectors in the entire economy. The fact that almost 50% of the country's energy resources are gas and oil, explains why this activity has always aroused interest economically, financially and in terms of scientific research. In terms of economic research, the analysis of the evolution of the oil industry highlights the changes made both in terms of volume and structure of the general and specific indicators.

This paper has attempted to highlight the restructuring that took place in the Romanian economy after 1989 and its negative influence on the development of oil industry in our country, the sharp decline occurred mainly after 2000.

First we mention a significant reduction in labour force, whose pace of decline in both analysed sectors it's 3 or 4 times bigger since 2000, compared to the previous period. Compressing the average number of employees was accompanied by the reduction by almost half of the physical production (during 1992-2013). After 2000, the most affected period was after the onset of the global financial crisis in late 2008, when there were significant reductions in all indicators (average number of employees, physical production, production value, imports).

Amid the sharp decline in oil industry in Romania, however, we also note positive aspects. The first aspect refers to the fact that in comparison with many European countries, Romania has a degree of energy dependence, rather small (about 25%). Also, this low level places it below the average of 50% of the indicator in the EU27.

Another positive aspect is the significant increase in labour productivity in 2008-2013. As we stated in the paper, this is the result of a decreasing of the average number of employees faster than decreased production. Obviously, however, productivity growth is certainly the result of the equipment and modernization that took place in this area with the restructuring and privatization.

The high level of labour productivity has allowed a level of the average net monthly earnings in the oil industry, much above of those of total economy and even of total industry.

References

1. Anghelache, C., *Tratat de statistică teoretică si economică*, Economic Publishing House, Bucharest, 2008.
2. EUROSTAT, Statistics explained – Energy production and imports, available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_production_and_imports, [accessed on 6 February 2016]
3. Lazăr M., Lazăr C., *Analiză statistico-economică*, Anghelache, C., *Tratat de statistică teoretică si economică*, Economic Publishing House, Bucharest, 2012.
4. Ministry of Economy and Finances (2007). International Conference “150 de ani de petrol in Romania – Traditia Evolutiei”, <http://www.150deanidepetrol.ro/scurt-istoric.html>, [accessed on 27 October 2015].
5. National Institute of Statistics, Bucharest, Romanian Statistical Yearbook, 2010 Edition, Bucharest, 2011.
6. National Institute of Statistics, Bucharest, Romanian Statistical Yearbook, 2013 Edition, Bucharest, 2014.
7. National Institute of Statistics, Bucharest, TEMPO database on-line, <http://statistici.insse.ro/shop/>