

ANALYSIS OF EXTERNAL TRADE ACTIVITY DYNAMICS IN ROMANIA

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ABSTRACT:

The globalization of markets, internationalization and globalization of national economies, the explosion of information, the increasing competition exerts an important influence on business and commercial transactions constitute exclusive forms of internationalization. For the analysis of the FOB exports, we resorted to the use of statistics indicators. The main method for data collection has been the statistical observation. Document analysis was the method used to create the database necessary to achieve research and support research undertaken.

KEY WORDS: *FOB exports, statistical indicators, dynamics indicators, econometric model.*

1. The structure of FOB exports in Romania

To analyze the dynamics of the level and structure of foreign trade at the national level we have considered publicly available data provided by the National Institute of Statistics database Tempo online www.insse.ro.

Exports of goods includes:[1]

- a. national goods (or nationalized) leaving the country permanently;
- b. national goods (or nationalized) leaving the country to be processed and then reimported;
- c. foreign goods re-exported after undergoing processing for which they were imported;
- d. non-monetary gold (gold is considered unrefined including ores and concentrates, the gold whose value is at least 80% of the total value, including filings and dust, as primary, both coins and bars and alloys;
- e. the export of electricity and natural gas;
- f. goods sent by parcel post;
- g. art objects, collections, antiques;
- h. ships and aircraft;
- i. silver ores, concentrates, ingots, silver pieces and worked;
- j. providing fuel and food by foreign ships and aircraft, on the national territory;
- k. cinema and television films exported;
- l. exportation of goods in financial leasing;

m. goods used to support the information and software, including floppy disks and CD-ROMs with software for general use (not ordered);

n. exchanges by way of civilian and military aid program, reparations and military equipment;

o. the goods supplied under loan or leased that are not returned within the time limits established or acquired permanently.

Exports of goods are valued at FOB value corresponding to the market price of goods external borders in exporting country. Exports of goods are valued free ceded based on the value of their assets like FOB.[2]

2. Analysis of the dynamics of the total volume of foreign trade in the period 2005-2014 in Romania

Foreign trade is of particular importance for the economy of any country because it is an effective measure for assessing the degree of competitiveness and development. The component parts of foreign trade, exports and imports, have an important role in carrying out any activities on the economy. In the context of globalization excessive external trade is an essential factor for sustainable economic growth. Every country, regardless of its economic importance, is involved in a lesser or greater in the international economic circuit.

Analysis of the global foreign trade activity of Romania is based on available official data taken from the website of the National Statistics Institute on the external trade in Romania. The value of two foreign trade is denominated in euros is determined based on FOB prices.

Romania's foreign trade is analyzed on the one hand globally in the period 2005-2014, in terms of economic development indicators using the media as a study of the dynamics, and secondly in terms of the forms of distribution property of foreign trade in the same range.

As defined by National Institute of Statistics „Exports of goods include all goods, whether for payment or free of charge, leaving the economic territory of the country of destination of the world.”

In the period under review, ie the timeframe 2005-2014, the volume of total value of foreign trade is presented in Table no.1.

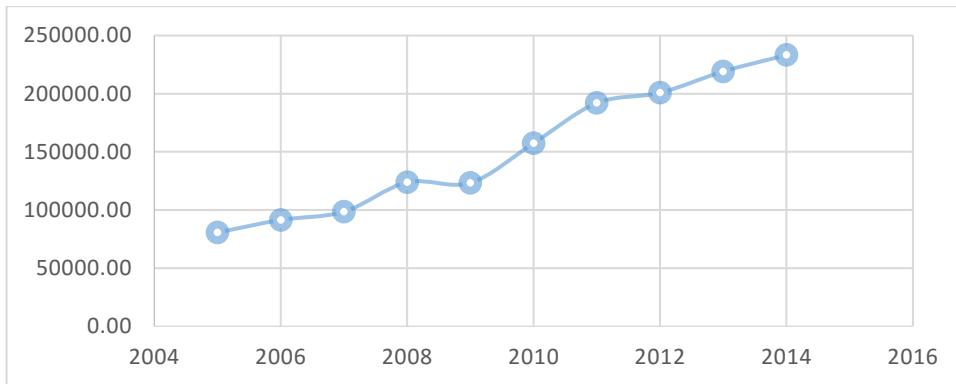
The graphical representation of the evolution of the overall level of foreign trade transaction value is shown in the chart no.1.

Table no.1.
The value of exports (FOB) - Total
-mil. lei-

Foreign trade transaction	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	80663	91472	98579	123812	123344	157436	191986	200790	219120	233215

Source: I.N.S.S.E, <http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=EXP101A>

Chart no. 1.
The exports FOB in Romania between 2005-2014 (mil. lei)



From the chart above we can observed the developments of total volume of FOB exports, ie a generally upward trend, except for the period of time between the years 2008-2009, when the total volume of foreign trade experienced in 2009 compared to 2008 a decrease, and in the timeframe 2009-2014, the volume of FOB value of foreign trade to resume its upward trend, increasing from year to year, although with a relatively low rate in 2011-2012. The decrease in foreign trade was recorded in 2009 due to the global economic crisis that began to manifest itself including in our country.

To analyze the evolution of the volume of foreign trade value of transactions for the period under consideration, we used time series statistical indicators, namely absolute, relative and medium indicators.[3]

The absolute indicators calculated with fixed-base and the base chained characterizing the dynamics of total value of transactions of foreign trade in the period 2005-2014 are presented in Table no. 2.

Table no. 2
Absolute changes in FOB exports during 2005-2014
-mil. lei

Year	FOB exports volume	Absolute changes	
		calculated with fixed base $\Delta_{t/t-1}$	calculated with the base chained $\Delta_{t/1}$
2005	80663	-	-
2006	91472	10809	10809
2007	98579	7107	17916
2008	123812	25233	43149
2009	123344	-468	42681
2010	157436	34092	76773
2011	191986	34550	111323
2012	200790	8804	120127
2013	219120	18330	138457
2014	233215	14095	152552

Source: own calculation

According to data from Table no.2, it shows the following:

- In 2009 FOB, exports decreased by 468 mil. lei compared to 2008, while in 2010 compared to 2009 we can see an increase, with 34 092 mil. lei;

- Until the year 2014, the data shows that FOB exports increased from year to year, the lowest increase recorded in 2007 compared to 2006 (7.107 mil. lei), while the largest increase was recorded in the year 2011 compared to 2010 (34.550 mil. lei);

- Relative to the reference year 2005, the data shows that in the analyzed period there were no periods of time where the volume of FOB exports to fall from the reference year;

- In 2010-2011 there was an increase in the volume of FOB exports in the previous period, the highest increase - is in 2011 compared to 2010 (an increase of 34.550 mil. lei);

- In 2012 there was a decrease in the volume of FOB value of exports compared to 2011 with 8.804 mil. lei.

- Considering the base year, 2005 respectively, it can be seen that the highest increase was recorded in 2014 compared to 2005, an increase of 152.552 mil. lei. The lowest increase was recorded in 2006 compared with the base year.

In terms of relative indicators on dynamics for the volume of FOB exports, we computed to the calculation of the dynamics indices, rate of increase and absolute value of a percentage of increase. The values of these indicators are shown in the table below:

Table no.3
The dynamics indices of FOB export during 2005-2014
-mil. lei-

Year	FOB exports volume	Dynamics indices		Rate of increase (decrease)	
		with the base chained $I_{t/t-1}$	with fixed base $I_{t/1}$	with the base chained $R_{t/t-1}(\%)$	with fixed base $R_{t/1}(\%)$
2005	80663	-	-	-	-
2006	91472	1.13	1.13	13.00	13.00
2007	98579	1.07	1.22	7.00	22.00
2008	123812	1.25	1.53	25.00	53.00
2009	123344	0.99	1.52	-1.00	52.00
2010	157436	1.27	1.95	27.00	95.00
2011	191986	1.21	2.38	21.00	138.00
2012	200790	1.04	2.48	4.00	148.00
2013	219120	1.09	2.71	9.00	171.00
2014	233215	1.06	2.89	6.00	189.00

Source: own calculation

According to the relative indicators value of the dynamics calculated in Table no.3, the data shows that FOB exports:

- Decreased in 2009 compared to 2008 by 0.99 times, ie decreased by 1%;

- Increased massively in the period 2011-2014 relative to 2005, the highest growth being recorded in 2014 by 2.89 times, which represents an increase of 189%, while the lowest increase was recorded in the year 2011 by 2.38 times, that is, 138%;

- Depending on the reference year 2005, we can see that the lowest increase in the volume of FOB exports was recorded in 2006, an increase of 1.13 times, which means a 13% increase.

- The volume of FOB exports increased during 2010-2014 from year to year, the highest growth being recorded in 2010 compared to 2009, an increase of 1.27 times, ie an increase of 27%, and the smallest increase was recorded in 2012 compared to 2011, an increase of 1.04 times, ie an increase of 4%.

The absolute value of a percentage of increase (decrease) with fixed base:

$$A_{n/1} = \frac{\Delta_{n/1}}{R_{n/1}} = \frac{80663}{100} = 806,63 \text{ mil. lei}$$

This indicator highlights that a rate of growth of FOB exports measure in absolute units 806.63 mil. lei.

The absolute value of a percentage of increase (decrease) with the base chained:

$$A_{n/n-1} = \frac{\Delta_{n/n-1}}{R_{n/n-1}} = \frac{219120}{100} = 2191,20 \text{ mil. lei}$$

This indicator reveals that a growing percentage of FOB exports worth in absolute units 2191.20 mil. lei.

3. Determining the evolutionary trend in the volume of FOB value of exports

The dynamics analysis requires the adjustment of time series analyzed to determine trends and to separate essential factors influence from the action of random factors that determine the actual value of the series deviation from the theoretical values. Consequently, the case is required to quantify the trend and, to this end, we proceed to apply elementary and analytical methods for determining the trend, followed by applying specific criteria to choose the most suitable trend.

The chart no. 1 shows an approximately an linear trend, so, for its quantification we used a linear trend function.

The expression of the trend function is as follows:

$$Y_{ti} = a + bxt_i$$

By applying the specific methodology for determining parameters a and b, shown in the table below, was obtained the following expression of trend function:

$$Y_{ti} = 87946.1 + 2031,09xt_i$$

Table no.4

Linear calculations underlying trend and forecast for 2017, 2018

Anul	Volumul exporturilor FOB (milioane lei)	ti	$Y_{ti} = 87946,1 + 2031,09xt_i$
2005	80663	-9	69666.29
2006	91472	-7	73728.47
2007	98579	-5	77790.65
2008	123812	-3	81852.83
2009	123344	-1	85915.01
2010	157436	+1	89977.19
2011	191986	+3	94039.37
2012	200790	+5	98101.55
2013	219120	+7	102163.73
2014	233215	+9	106225.91
2017		+11	110288.09
2018		+13	114350.27

4. Analysis of the correlation between the evolution of GDP and volume of FOB exports

In the specialized literature it has been demonstrated that there is a positive correlation between changes in GDP and volume of FOB exports.[4]

To highlight the correlation between GDP development and volume of FOB exports in our country, we considered the volume of FOB exports and GDP in developing variables defining econometric model that describes the relationship between two variables. The data is taken from the website of the National Statistical NIS in terms of volume and value of FOB exports and the official statistical website of the European Union, Eurostat, respectively, in terms of GDP value. The data characterizing from a quantitative point of view the two variables are shown in the Table no. 5. It should be noted that the analysis performed covers the time period in the range 2005-2014, the period under review and in the previous sections.

Table no. 5.
-mil. euro-

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
FOB exports	22,255.00	25,850.00	29,549.00	33,725.00	29,084.00	37,360.00	45,292.00	45,069.00	49,562.00	52459.00
GDP	79,801.90	86,086.10	91,524.30	98,250.30	91,789.30	90,734.70	92,847.70	93,364.30	96,655.30	99,458.40

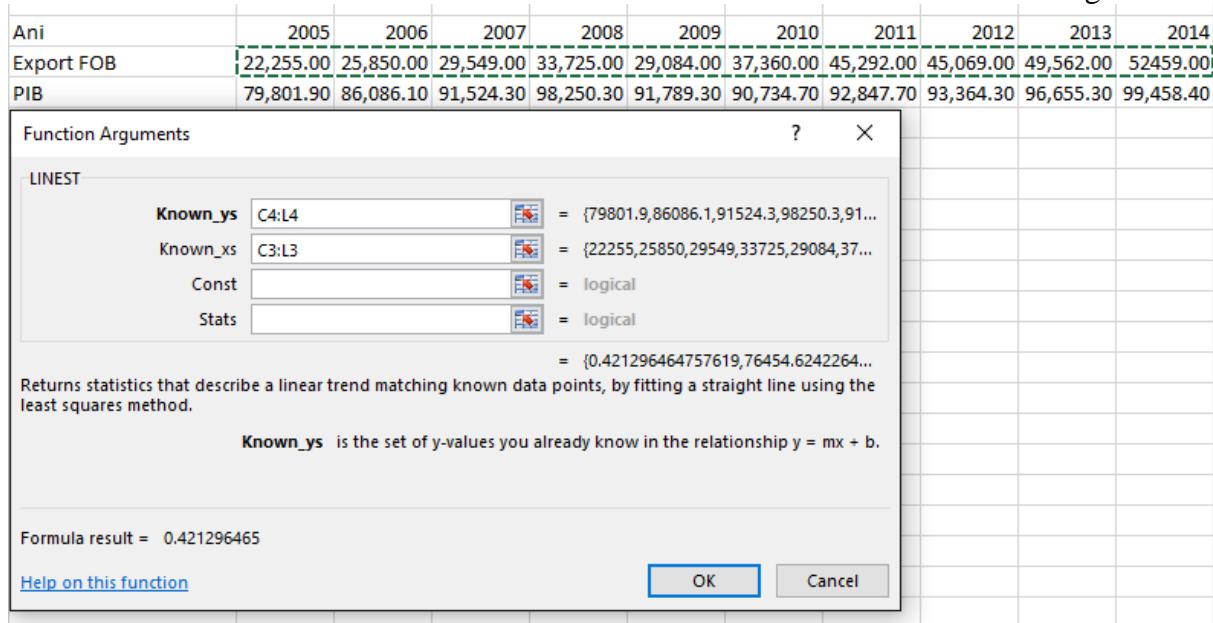
Source: Institutul Național de Statistică (www.insse.ro) and Eurostat (www.eurostat.eu)

The econometric model that describes the relationship between the two variables is:

$$GDP = a_0 + a_1 \cdot FOB \text{ Exports}$$

The next operation consists in estimating the model parameters using estimators. To this end it will use the least squares method. The regression table obtained with Microsoft Excel is shown in Fig. no. 1.

Fig. no. 1



As can be seen from the above figure, the positive value of the estimator of regression parameter shows that there is a direct link between the two variables, the growth of FOB exports

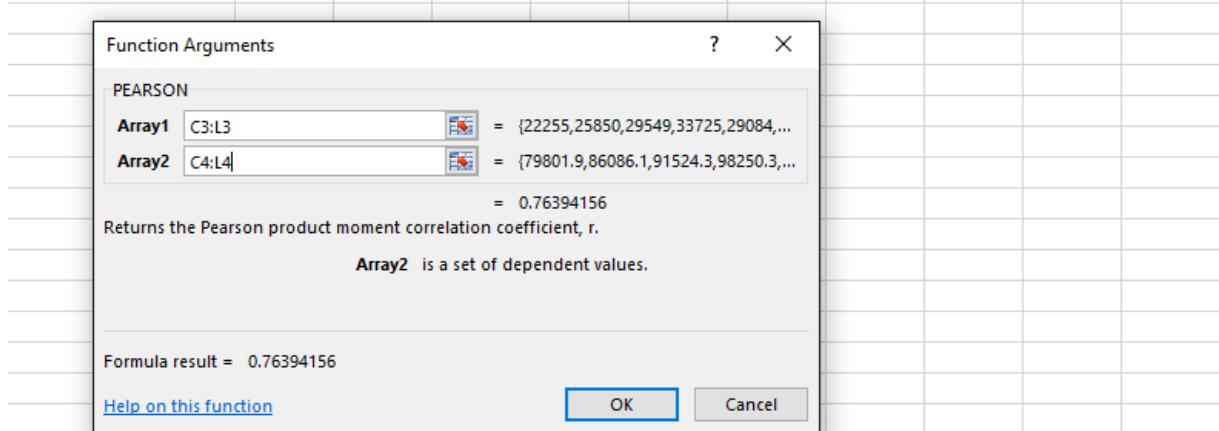
affecting the forward evolution of GDP. In other words an increase by one absolute measure of FOB exports, ie one million euros, we will see an increase of 0.4212 million euro of GDP. To observe the intensity of the relationship between the two variables we proceed to determine the Pearson correlation coefficient based on the relationship:

$$r_{y/x} = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{n\sigma_x \sigma_y}$$

The Pearson correlation coefficient obtained with Microsoft Excel is shown in Fig. no. 2.

Fig. no. 2

Ani	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Export FOB	22,255.00	25,850.00	29,549.00	33,725.00	29,084.00	37,360.00	45,292.00	45,069.00	49,562.00	52,459.00
PIB	79,801.90	86,086.10	91,524.30	98,250.30	91,789.30	90,734.70	92,847.70	93,364.30	96,655.30	99,458.40



From the picture below we can see that Pearson coefficient is 0.76, which confirms a direct link between the two variables. This factor is in the range [-1, 1], is greater than zero and tends to +1, for which we can say that there is a strong correlation between the two considered variables.

5. Conclusions

FOB export business covers a wide spectrum of activities, characterized by varying degrees of complexity, with different financial and economic functions and a wide variety of proportions between their content

After analyzing the foreign trade activity of Romania we found that in the period under review, ie 2005-2014, Romania's foreign trade has generally had an upward trend except for 2009 when the economic crisis occurred in late 2008 widened.

Analysis of the correlation between GDP and volume of FOB value of exports carried by using Excel in the period 2005-2014 confirmed scientific hypotheses set out in the literature on the positive correlation between the evolution of GDP and FOB export value.

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