Analysis of the Comparative Economic Advantage Case Study – Romanian Economy

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Abstract: *For this analysis, the first step is the understanding of the concept of foreign trade and of means through which we can determine if a country is competitive compared to another country or group of countries.*

This study analizes the commercial relations that Romania has with the European Union, thus making an "X-ray" to the Romanian foreing trade.

In the second part of this work, the model of the foreign trade multiplier is presented.

From the abovementioned work we can understand that the values of the multiplier vary quite significantly from one year to another which leads us to doubt its relevance.

Keywords: comparative advantage, foreign trade, E.U., foreign trade multiplier

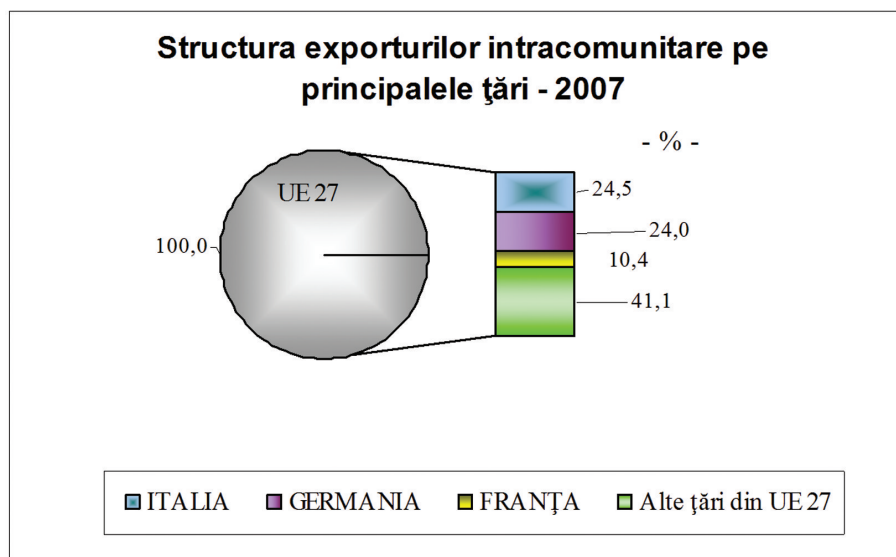## 1. The main European commercial partners of Romania

On the first three places, in a descending order of the volume of the trade with Romania, we can find: Italy, Germany and France. For a wider look at the geografical concentration degree and the place that EU-memmber countries occupy within the whole of the commercial partners of Romania, a concentration graphic is used (Graphs 1 and 2), in which percentages of the total trade with the EU, of the total trade and the number of EU-member countries are show.

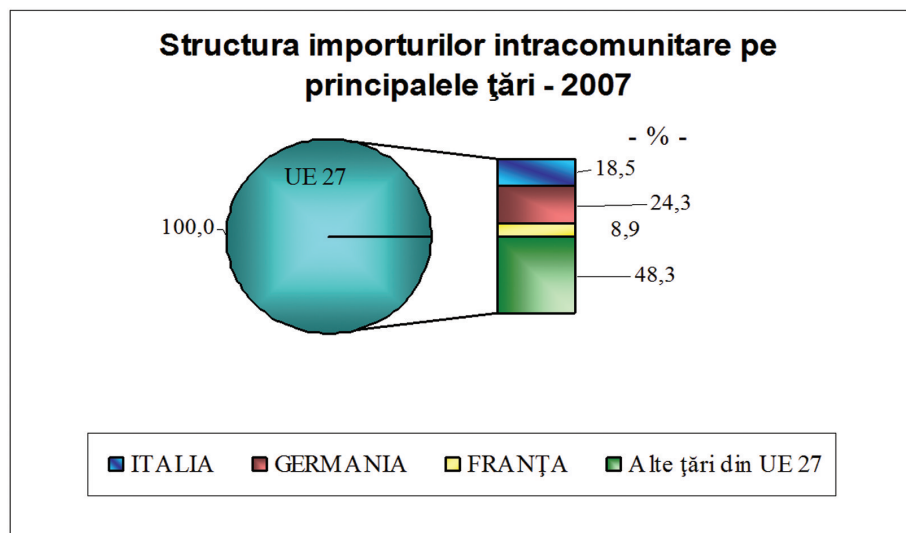The main commercial partners of Romania in terms of exporting to the EU are Italy, Germany and France.

Export to these countries represent ap - prox. 60% of the total export of Romania in 2007

Graphs 1. *Graph of the exports to the E.U. countries*

Structura exporturilor intracomunitare pe principalele ţări - 2007

- % -

UE 27

100,0

24,5
24,0
10,4
41,1

☐ ITALIA   ☐ GERMANIA   ☐ FRANŢA   ☐ Alte ţări din UE 27

Source: INS, Anuarul Statistic

Graph 2. *Structure of the imports from EU countries*

Structura importurilor intracomunitare pe principalele ţări - 2007

- % -

UE 27

100,0

18,5
24,3
8,9
48,3

☐ ITALIA   ☐ GERMANIA   ☐ FRANŢA   ☐ Alte ţări din UE 27

The main commercial partners of Romania in terms of importing, in 2007, are Italy, Germany and France, the same as for the export. Import from these countries ma - kes up more than 50% of the total import made by Romania.

We can see that the first 10% of the commercial partners of Romania make up approx. 60% of the trade that Romania makes with the E.U. countries.

2. Foreign trade multiplier

Using this indicator, we will observe the relation between the Gross Income (economic growth) and the foreign trade, with

the help of static regressions. We have chosen to make such an approach, keeping in mind that we are trying to express the efficiency of the foreign trade based on statistic indicators. Of course, by calculating this indicatior using simple regressions, we only intiate a study that is based on finding out corelations, without using statistic instruments form the temporal series econometry. This so because we are testing a model that has been introduced in the literature in a well-determined form and by applying it, if no satisfactory results are obtained, the problem can be solved through correction and calibration.

For calculating the foreign trade multiplier, the import marginal incline m and the consumption marginal incline c' need to be calculated first. For finding out these parametres, there are two means of calcuation:

1) The „per-say" formula of the parametres, as a ratio between absolute differnences, measured in two succsesive periods of time. We have:

$$m = \frac{M_1 - M_0}{Y_1 - Y_0}$$

where: M_1, M_0, Y_1, Y_0 represents the import, respectively the income at time t_1 respectively t_0

and the consumption marginal incline:

$$c' = \frac{C_1 - C_0}{Y_1 - Y_0}$$

where: C_1, C_0, Y_1, Y_0 means the consumption, respectively the income at time t_1 respectively t_0;

2) By expressing the formulas at pt. 1) to the limit meaningly by defining the parametres as: $m = \dfrac{dM}{dY}$ and $c' = \dfrac{dC}{dY}$ (practically ,from Δ to d). By integration we have the following formulas:

$$M = mY + M \qquad (1)$$
$$C = c'Y + C_0 \qquad (2)$$

An estimation of the m and c' parametres through simple liniar regression will be done, for the years 1997 to 2007. The foreign trade multiplier is expressed using this forumula: $M_x = \dfrac{1}{1 - c + m}$. It has been demonstrated supposing the presumptions of the 2nd mean of calculation are right.

We will consider that, if the parametres m and c' are stable troughout the period of the study, the regressions expressed trough the first (1) formula must be significant and shall pass all statistic tests for the verification of the probability of simple liniar relation.

The setting of the m and c' parametres reffers to their variability in a close value string. This helps us consider the indicators as significant for the entire period of the study, allowing for their further use in forecasts and embedment in complex models, that require a single value for each indicator, throughout the entire period of the study. After the testing of m and c' parametres during the considered period, we will calculate the global foreign trade indicator for the entire period and we will be able to tell if it reflects the dynamics of the foreign trade during the considered period.

By applying the first mean of calculation, we obtain the foreign trade multiplier, expressed in year t with respect to year $t\text{-}1$. In Table no. 1 we can see the results obtained based on data expressed in „lei" from 1997 to 2007. The calculation of this indicator is done in a chain relation so it is difficult to see a wider perspective.

The foreign trade multiplier is expressed through the formula: $M_x = \dfrac{1}{1 - c + m}$

where c – is the consumption marginal incline;
m – is the import marginal incline.

Table no. 1. *Foreign trade multiplier*

Foreign trade multiplier (1997-2007)							
Year	Import incline	Consumption incline	**Multiplier**	Import	Export	Final con-sumption	Available income	Gross income (PIB)
1997				7,54	6,07	21,86	25,4759	25,29
1998	0,185440021	0,97335	**4,714986549**	9,75	7,37	33,46	37,3935	37,11
1999	0,288503277	0,792458	**2,015943483**	15,2	13,1	48,43	56,2841	54,57
2000	0,44619609	0,827297	**1,615772967**	26,51	22,6	69,4	81,6317	80,37
2001	0,404339933	0,800428	**1,655870659**	41,7	32,9	99,47	119,1991	116,76
2002	0,327730985	0,708215	**1,614163187**	54,56	45,9	127,26	158,4386	151,47
2003	0,427557711	0,942468	**2,061475789**	73,6	58,52	169,23	202,9706	197,56
2004	0,460836383	0,831038	**1,587809409**	98,26	76,79	213,7	256,482	246,37
2005	0,389193785	0,608719	**1,281271665**	118,4	92,6	245,2	308,23	285,3
2006	0,621615472	0,821843	**1,250355619**	145,72	125,73	281,32	352,18	324,5
2007	0,735806773	0,956175	**1,282657298**	175,27	142,7	319,72	392,34	381,9
		Average	**1,908030662**					

Source: INS, Anuarul Statistic al României, Sistemul Conturilor Naționale

* The data in the table is in billion lei.

Graph 3. *Evolution of the foreign trade multiplier*
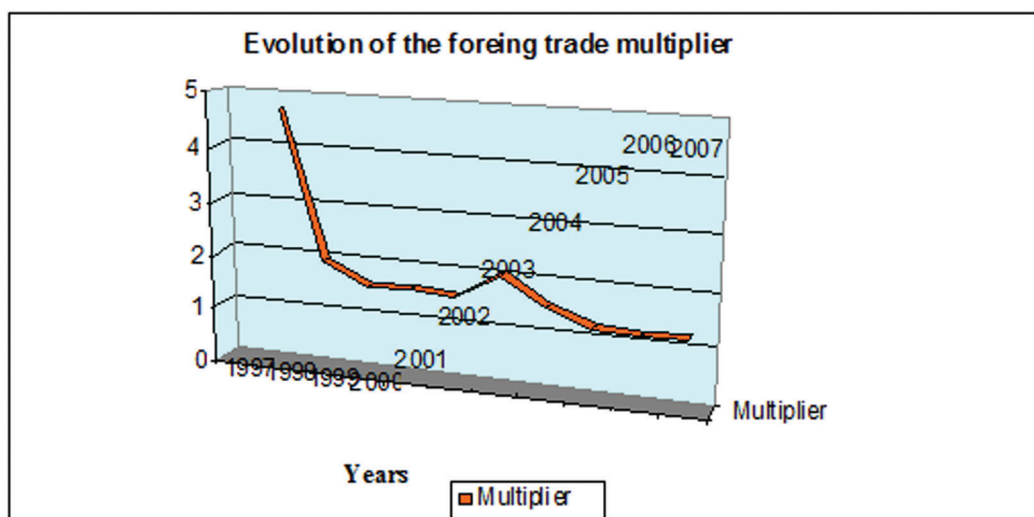
Primary source: INS

From the abovementioned graph we can understand that the values of the multiplier vary quite significantly from one year to another which leads us to doubt its relevance.

Interpretating: With the growth by 1 unit of the export in 2007, the Gross Income has grown by 1,28 times. The multiplication effect is obvious, taking into consideration that the value of the multiplier is greater than 1.

The import marginal incline has a very important role in calculating this indicator.

If we consider the arithmetic means of parametres *m and c'* on the given period, the following value for the trade multiplier cand be obtained: Foreign trade multiplier (1997-2007)

Table no 2. *Foreign trade multiplier*

Multiplication-parametres	m	C′	Multiplier
Average value	0,43	0,82	1,65

On average, on the given period, the national income (NI) has grown by 1,65 times. The differences between this mean of calculation and the previous one are not important. For this reason, we can consider that the liniar dependencies are checked.

The reserve is due to the high and controverse fluctuations and also to the detemining type of calculation. For these reasons, we can move on to the 2nd mean of calcula - tion, meaningly the determination of the parametres though the liniar regression model, based on the following relations (obtained based on relations (1) and (2) from the pre - vious chapter, to which we add the residual variables):

$$M = mY + M_0 + \varepsilon_M \quad (1)$$

$$C = c'Y + C_0 + \varepsilon_{C'} \quad (2)$$

(where: ε , respectively μ are the residual variables;

C_0 - independent income consumption;
M_0 - independent income import;
Y - the income at a given period of time;
c', m – the consumption and import marginal inclines;

The govermental investments and expenses from the consumption ecuations are considered as given, that's why we have omitted them, as they can be embedded in the free term, respectively in C_0 and do not affect the parametres of the regressions. We would like to point out that the regressions can also be done based on the logarithmic expressions, meaningly:

$$M = mY + M_0 + \varepsilon_M \quad (1)$$

$$C = c'Y + C_0 + \varepsilon_{C'} \quad (2)$$

The logarithmic method has been proposed by G. Ghani in 2004. He used logarithmic regressions for more than 60 countries over the 1985 – 2001 period.

In this case, we will try to determine the *m and c'* parametres, through simple liniar regression over the 1997-2007 period, for Romania.

During the phase of specifying the previous relations, we assume that the income is increasing, having a significant influence on the dependent variables, import and consumptions and we have also neglected a lot of other varibles.

In the liniar regression model, this is equivalent to assuming that some regression coefficients are different from zero (the coeficients of the independent variables included in the model) and others are zero (coeficients of the omitted variables).

The question that arises is if this assumption is a good one, because both hypothesis can be rendered invalid based on the real data. The income that we have assumed to

have a significant influence on the consumption and import can prove to be insignificantly influent, while another omitted variable can be a highly significant factor.

That's why statistic offers the chance of testing the significance of the regression coeficients of the considered variable and of testing the residuals in order to observe if their behavior indicat an adequate specification of the model. The significance of the regression models shall be tested using the Student test. The Student test is used for the determination of the significance of the regression ecuation parametres. We consider the following hypothesis:

H_0: an estimation of the regression incline coeficient (in our case *m*, respectively *c'*) does not differ significantly from the null value.

The Student test consists of calculating the *t* statistic, which has to be greater than the value in the table, for a number of 10 degrees of freedom, in this case, the value in the table for statistic *t* being 2,228. For statistic *F*, the value in the table is 4,96.

In fact, the two tests are interdependent, their results showing the significance of the simple regression coeficients and the fact that there is a liniar corelation between the variables.

In order to determine how an exterior variable (in our case *Y*) has a significant influence the value of the internal variables (in our case *M and C*), the following null hypothesis is used:

H_0 : the estimated value of the regression coefcicient does not significantly differ from zero, in other words, the external variable does not significantly influence the internal variable.

The data obtained without logarithmation are closer, regarding the marginal inclines, to what we have obtained through determining calculation.

The statistic *t* variable, for all the coeficients, is great enough for passing the Student test. So, the H_1 hypothesis is rejected.

The *F* test of the variation proves, in addition, that the external variable significantly influences the internal variable, the results of the calculated *F* being significantly greater than the value in the table.

The estimation of the parametres of the regression ecuation has been made using the SPSS program.

3. Conclusions

The study of the comparative advantage is of great importance because it represents an engine of the economic growth. An essential component is the analysis of the foreign trade through specific indicators.

Furniture and footwear are the main sectors that generate income in the relation with the countries of E.U.. If the product group in which a comparative advantage on the global relation is identfied has a big ratio in the export and import to and from the E.U., in the total export and import, this fact is a first clue that the comparative advantage is maintained. The data also shows that in all groups (with small exceptions), Romania exports, respectively imports in quite a large ratio from and to the E.U.

The indicators of the comparative advantage have an overall increasing tendency, which is a good sign for the Romanian economy.

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