Spatial Approach On The Romanian Foreign Trade

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Abstract

We hereby intend to analyze some aspects of the current evolution of the Romanian foreign trade. We intend a framing of the place held by our country’s foreign trade, within the world economy. These aspects are detailed with an analysis of the export structure, on the main commercial partners. We draw a shaping of these commercial flows, with a model of gravitational type, in which we have taken into account the dependency of a series of factors, such as: the size of the partner countries, the physical distance of these countries to Romania, and the commercial costs. In this approach we have taken into account the fact that Romania became a member of the European Union beginning with 1\textsuperscript{st} January 2007, and at the same time, we are pursuing if this event influenced the export flows of our country, besides the specific factors of a model of gravitational type. Following this intention, we used statistical modeling, and in this case we employed different statistical software, such as Minitab and Stata.

Keywords: commercial cost, physical distance, partner countries;

1. Introduction

The contemporary history of our old European continent knew a huge process of social changes in 1989 year, beginning with the falling down of the Berlin, continuing with the “Velvet revolution, and ending with the Romanian bloody revolution. In fact, this ending of the European revolutions was a great begin for all the ex-communist countries, as an important transformation processes began in all of them.

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doi:10.1016/j.sbspro.2015.04.592
So, for Romania this was the moment of change for the whole society, passing from the socialist economic system to one based on market principles, and thus, passing through a long and difficult transition. So, in these twenty four passed years from the Revolution, Romania scored a series of major changes-over in the process of democratization of society, as well as of the economic life. This transition from the command economic system, a very centralized one, to that of the market economy represented priority objective of this passed stage. Another important fact at that time was the dissipation in 1991 of the Council for Mutual Economic Assistance (COMECON) represents a phenomenon with a significant impact towards the Romanian economy. This one besides the transitions costs to the market economy was also forced to bear the costs caused by losing the loss of the sales markets, represented by the COMECON countries.

2. Methodology and results

This process of reorganizing foreign trade was possible as effect of the quantitative and qualitative bettering of the logistic systems, which made possible these changes under efficiency conditions, despite the physical distances that were greater. Nevertheless, we have to mention that both GDP, and also the exports were generally speaking at a level situated under the level of the population, as indicators calculated as weights of Romania comparing with the world level. These indicators are presented in the Graph 1 in the left side designs a reduced extent of economic development and of participating to the international trade of Romania, comparatively to the world level. Another negative characteristic of the Romanian foreign trade evolution is the chronic deficiency, reflected by the surplus of the imports towards the exports, as per the right side of the Graph 1. This commercial deficit was a favoring factor of the Romanian considerable external debt, which reached almost 80 billion of euros, by the end of 2013 year, i.e. 60% of the country GDP according to (Străuţ, 2013).

Graph 1 - External Trade of Romania

Source: http://adevarul.ro/economie/bani/datoria-esterna
The Romanian imports present a high level of focusing on partner countries, as anyone could notice in the graph from the figure no. 2. So, as it could be seen from the analyses of the 45 partner countries taken into account, only 3 of them succeed to focus 40% of the imports value; other 20 countries detain 90% from the import value. The same tendency of focusing the value of the Romanian imports, scored on the basis scored in 2010 year could be noticed both at the level of Europe and Asia continent, focusing about 98% from the imports value, and 89% from the number of partner countries.

The main provider for the imports in this stage was European Union that means as value of 76%, and with a rate of 58% from the point of view of the partner countries, as could be seen in the following table 1:

| Continent | Freq no. countries | % nr Countries | % Imports | UE | Freq no. countries | % no. Countries | % Imports |
|-----------|--------------------|----------------|-----------|----|--------------------|----------------|-----------|
| Africa    | 1                  | 2.22           | 0.07      | UE | 26                 | 57.78         | 75.62     |
| America   | 3                  | 6.67           | 2.09      | non | 19                 | 42.22         | 24.38     |
| Asia      | 7                  | 15.56          | 14.39     | UE | Total              | 100%          | 100%      |
| Australia | 1                  | 2.22           | 0.04      |    |                    |                |           |
| Europe    | 33                 | 73.33          | 83.41     |    |                    |                |           |
| Total     | 45                 | 100%           | 100%      |    |                    |                |           |

Source: http://www.insse.ro/cms/ro/content/anuarul-statistic-2011

Taking into account these peculiarities of the Romanian imports we detail the analyses, by including some influence factors, as the value of exports scored by the origin countries, as well as of the commercial costs and the physical distance between Romania and the countries where those imports come from. Regarding the commercial costs, these designate an ad-valorem bilateral measure for the imports and exports between two countries that could appraise which are the lowest commercial costs for the partners for a certain country (ESCAP-WB Trade Cost Database, August 2013, No. 121) whose level for Romania in the commercial relations with the partner countries were taken over from the UNESCAP source (UNESCAP). The physical distances were figured out on the basis of the application from www.distancefromto.net, which is expressed in km. On the basis of the scored data of the Romanian imports in 2010, processed with STATA 12 software there was obtained the following results in the table 2 and table 3:
Tabel 2. Model vs Residual

| Source | SS     | df    | MS     | Number of obs = 45 |
|--------|--------|-------|--------|--------------------|
| Model  | 58845462.2 | 3     | 19615154.1 | F( 3, 41) = 17.63 |
| Residual | 45604205 | 41    | 1112297.68 | R-squared = 0.5634 |
| Total   | 2373856.07 | 44    | Root MSE = 1054.7 |

Tabel 3. Import – Export.

| Imports | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|---------|-------|-----------|-------|------|---------------------|
| Exports  | .0035501 | .0007405 | 4.79  | 0.000 | .0020546 to .0050456 |
| Cost     | -1041.155465.2475 | -2.28 | 0.028 | -1962.566 to -119.7448 |
| Distance | -0932889 | .088899 | -1.05 | 0.300 | -.272824 to .0862462 |
| _Cons    | 2952.764 | 954.7461 | 3.09  | 0.004 | 1024.615 to 4880.912 |

The generated report provides information for the variation of the model, and for the estimating parameters. So, on the ratio basis of the model mean square to the residual mean square gives a F test for the hypothesis that all regression coefficients in the fitted model are zero (H_0). So, as it can be noticed the value of the F test is of 17.63, scored for (3.41) liberty grades, meanwhile the critical value is about 2.83. As it could see, F_{cal}>F_{crit} that means it is rejected the null hypothesis (H_0), or in other words the coefficients in the fitted model are different from zero. The statistical value R-squared is 0.5634, that signifies the fact that 56.34% of the modifying the imports of Romania is due to the modifying of the partner country exports, and also of the commercial costs, and of the physical distance between Romania and the partner country. The regression coefficient expresses the influence upon the imports under the conditions modifying the independent variables with an unit. Thus, concretely, if the partner countries exports would rise with 1 million euro, than the Romanian imports rise with 3.500 euro. If the distance between Romania and the partner country would rise with 1 km, than the imports reduce with 93.289 euro. The increasing of the commercial costs with 1 unit is reflected in a reducing of the imports with 1041.155 million of euro. The variance inflation factor (VIF) for each of explanatory variables, which gives information about a possible collinearity between the variables of the model is as follows:

| Table 4. Variable |
|-------------------|--------|--------|
| Variable | VIF  | 1/VIF |
| distance | 2.86  | 0.349859 |
| cost    | 2.36  | 0.424276 |
| Exports | 1.58  | 0.632376 |
| Mean VIF | 2.27 |

Thus, it could be considered that as the values are smaller than 10, and the VIF media is almost to value 1, the existence of collinearity is excluded (Rabe-Hesketh, S., Everitt, B., 2004), this meaning validity of the model.
Referring to the significance of the coefficients, having as basis criteria of 5%, one could notice that the distance factor is not significant, that is to say that distance would not have an influence upon Romanian imports.

In such conditions, it can be used an automatic way of choosing the variables, with explanatory variables whose F-values for removal have associated p greater than 0.2 being removal, as follows:

1. \( \text{sw regress imports exports cost distance, pr (0.2), begin with full model p = 0.3001 >= 0.2000 removing distance.} \)

| imports  | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|----------|-------|-----------|-------|------|---------------------|
| exports  | .0030797 | .0005901 | 5.22  | 0.000 | .0018888 - .0042706 |
| cost     | -1.404.186 | 297.8174  | -4.71 | 0.000 | -2.005.206 - -803.1664 |
| cons     | 3.620.173 | 712.9254  | 5.08  | 0.000 | 2181.431 - 5058.914 |

If we use a similar procedure on two structures formed from the point of view of membership of the European Union will obtain the following results:

2. \( \text{sw regress imports exports cost distance if ue==1, pr(0.2), begin with full model p = 0.4956 >= 0.2000 removing cost.} \)

| imports  | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|----------|-------|-----------|-------|------|---------------------|
| exports  | .0078429 | .0007414 | 10.58 | 0.000 | .0063093 - .0093766 |
| distance | -1.8747729 | .2469414 | -3.54 | 0.002 | -1.38561 -3639357 |
| cons     | 1.251.889 | 381.3853  | 3.28  | 0.003 | 462.9331 - 2040.844 |

3. \( \text{sw regress imports-exports cost distance if ue==0, pr(0.2) begin with full model p = 0.7019 >= 0.2000 removing distance.} \)

| imports  | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|----------|-------|-----------|-------|------|---------------------|
| exports  | .0012044 | .0004539 | 2.65  | 0.017 | .0002421 - .0021667 |
| distance | -1.491.6385 | 272.9792 | -1.80 | 0.091 | -1.070.328 87.05149 |
| cons     | 1571.062 | 722.5799  | 2.17  | 0.045 | 39.26121 - 3102.863 |

One could see that the Romanian imports are influenced by the exports of the partner countries, but particularly different by the distance and cost (http://www.distancefromto.net/countries). Thus, the imports of countries which are members of European Union are influenced by distance; meanwhile those coming from those which are not members of European Union are depending on the commercial costs. The explanation lies in the fact that the imports coming from European Union benefit of commercial preferences, which are reflecting in more reduced commercial costs, comparatively to the imports coming from other countries. These behaviors of the imports can also be verified using graphics 3 and 4:
3. Conclusions

Our study tries to show the high extent of focusing the Romanian imports from the point of view of the provenience of the countries. The same phenomenon is scored towards the European Union countries, which are holding 75% of the value of Romanian imports. As for the influence factors, the dimensions of the exports for the partner countries influenced positively, meanwhile the factors commercial costs and physical distance influenced in a negative manner. The imports were differently influenced by these factors, taking into account membership of the European Union countries.

4. Bibliography

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