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THE IMPACT OF THE EXCHANGE RATE ON THE COMMERCIALS FLOWS

Case study

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Exports
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JEL Classification
C29, E40, F31

Abstract

The liberalization of capital movements between states and of the trade of goods and services, are one of the most important phenomena in the current world economy. The purpose of the present study, in the case of Romania, is to answer the question whether the interventions by means of the exchange rate of the national currency contributes to the fluidization and improvement of the commercial trades. The study demonstrates that the leu devaluation does not lead to a substantial increase of the exports. As a mechanism of influence of the commercials flows, the exchange rate has a short-term influence and the economy requires structural reforms, meant to stimulate the growth of the economic competitiveness.

Literature review

In literature, the issue of the balance of payments has been analysed under different economic currents which spawned three different approaches: the approach by absorption, the capitals movement approach and the monetary approach of the balance of payments (Genereux, 2000, pp 43-50). In this study we will only address the approach by absorption of the balance of payments and the mechanism of the J curve, which explain how the depreciation of the exchange rate affects the dynamic of the international trades.

The approach of the balance of payments through the absorption method involves the analysis of the elasticity of the import/ export demand which is well-known in the empirical research, especially in the analysis of the commercial performances of the developing countries. These are focused mainly on the trade balance, while the capital movements are considered exogenous and play a minimal part in the analysis of the balance of payments (Arize et al, 2000).

The exchange rate is an important variable in the approach from the elasticity theory's perspective: in order to eliminate the commercial deficit we resort to the devaluation of the national currency. The necessary and sufficient condition for the devaluation to improve the trade balance is that the sum of both elasticity of import and export to be bigger than 1 (Ex + Em> 1). This concept is known in literature as the Marshall-Lerner condition (the M/L condition). The name comes from the two researchers Alfred Marshall and Abba Lerner who proved this hypothesis (Krugman and Obstfeld, 2003).

In case the elasticity of the export and import demand doesn't comply with the M/L condition, then de devaluation would lead to an increase of the current account deficit or it would reduce the surplus (Pitchford, 1995). In order for the devaluation to diminish the external deficit it is necessary that the exports' incomes be higher than the imports' expenses, meaning the $PxXPmM$ ratio has to increase (see Ignat, Pralea, 2013, pp. 168-169). The effect of the devaluation leads to a reduction of the Px/ Py ratios which entails a bigger increase of the ratio between the volumes of exports and imports: X/ M.

The exchange rate affects the stability of the balance of payments as a result of their connection. Cooper (1978) has studied the devaluation effect on the balance of payments for the developing countries. He discovered that the current account of the balance of payments has improved for three thirds of the studied cases due to monetary devaluation. Therefore, the national currency devaluation can lead to the increase of exports and the decrease of imports, which, in the long term, improves the stability of a country's balance of payments. On the other hand, Birds (1984) considers that the stabilization of the balance of payments as a result of this phenomenon does not necessarily mean it is always due to monetary devaluation. Donovan's (1981) researches suggest that devaluation can improve the current account of the balance of payments without having a significant impact on imports.

Syed and Anwar (2011) offer an interesting analysis on the effects of modifying the exchange rates, proving that the effects obtained by the forced currency devaluation to stabilize the balance of payments are mostly side effects. They explain that, most of the time, the devaluation is a result of output collapses, increased prices and improvement of the commercial balance. In the absence of weak side effects of the exchange rate, in short term, even if the national currency devaluation favours exports, at the same time negative side effects of the trade balance occur, and this is known in literature as the J curve.

The J curve analysis, see Appendix A, fig. 1, presents two effects that occur in the dynamics of the exchange rate on the trade balance: "the price effect" and "the volume effect". The price effect implies that in short term the exchange rate devaluation would cause a price increase of the imports and a price decrease of the exports. And because, in short term, the volume of imported and exported goods could not be changed, at first, the trade balance could decline to the N point. Nevertheless, on long term, the volume alterations of imports and exports correspond to the exchange rate modifications and so the volume effect will dominate and will eliminate the negative consequences generated by the price effect.

The necessary condition for the J curve to produce the anticipated effects in medium and long term is for the production of goods and services to correspond to the external demand regarding a competitive quality and price. In the current study, applied to the case of Romania, we will see for which category of products the effects of the J curve are being validated or invalidated.

Methodology

In this study, in order to observe the influence of the exchange rate on exports and imports, we have used the method of the autoregressive vector (VAR).

The hypotheses wishing to be validated are as follows:

1. In the medium term, the national currency devaluation does not significantly affect the exports' increase (in order for the exchange rate influence to be significant both for exports as well as for imports, the variation should not be higher than 20%).
2. In the medium term, the national currency devaluation does not significantly affect the imports' increase.

The study is based on the following monthly data series, recorded for a period between January 2007 – December 2013:

- The nominal values of the leu/ euro exchange rate;
- The value of exports, by different product categories, in thousand Euros;
- The value of imports, by different product categories, in thousand Euros.

The analysed categories of products, according to the CSCI classification, are as follows: foods and livestock, beverages and tobacco, manufactured articles, cars and transport equipment.

The data have been taken from the Romanian National Institute of Statistics website and from the Romanian National Bank website. The data series are logarithmic in order to stabilise the variation and to facilitate the coefficient interpretation of the estimated equations.

The analysis starts from using a VAR (autoregressive vector) model. The choice of the methodology is justified by the nature of the study. The macroeconomic phenomena are manifesting as complex dynamic systems with feed-back and mutual causality. Thus, the analyses of the system type seize the connections between macroeconomic variables. The VAR models are focused on the analysis of shocks on the studied variables. In the present study we have analysed the evolution trend of imports and exports when faced to a forced devaluation of the national currency.

To estimate a model between the studied variables we follow these steps:

1. Verifying the stationarity of time series;
2. Verifying the co integration relationship between the analysed variables.

The first step in estimating the model is made by examining the stationarity of time series using the augmented Dickey – Fuller test (ADF).

The hypotheses to test are as follows:

H_0: the series has a unit root and is non-stationary;

H_1: the series is stationary.

We notice the series of the exchange rate, of the value of exports and imports for each category of products, are non-stationary (the value of Prob. > 0.05), but by applying the unit root test for the differential series we see that the series are stationary (the value of Pro. <0.05 which indicates the H_0 hypothesis is rejected), concluding that the series are integrated by the order one.

The second step is verifying the co integration relationship between variables. This can be regarded as a long-term relationship, of balance between variables. In short-term there are deviations from this balance due to unpredictable shocks, but in long-term the co integration relationship between variables tends to be balanced. We consider two time series integrated of order one as co integrated if a linear combination of the two is stationary (integrated of order 0) even if each of them individually are not stationary.

In order to observe if between the analysed variables the co integration relationships exist, we use the Johansen test. As can be seen, there are co integration relations between the exchange rate on one side and exports and imports on the other, for each of the product categories (both the Trace test as well as the Eigen value test indicate the existence of a single co integration relationship at a materiality threshold of 5%). Considering the co integration relation between the variables and their stationarity, we will use a vector error correction model (VEC) in our analysis.

In the next stage we will estimate the equations between the exports value and the exchange rate and between the imports value and the exchange rate using the vector error correction model. We use this model because the series are stationary and integrated.

With the use of the shock response function we analyse the response of the exports and imports value to a shock in the evolution of the exchange rate (the leu devaluation), on a 12 months span.

Results and discussions

The impact of the exchange rate variance on exports and imports for the category of food products and livestock

In the Fig. no. 2, appendix A we notice that the value of the food products and livestock exports has an upward trajectory 3 months after a shock occurrence on the exchange rate (the leu devaluation against the euro). The same trajectory is noticeable in the case of the imports' value but with less magnitude. In other words, when the national currency is devaluated, the exports of food products and livestock increase significantly in the first three months, following an upward trend. The same course applies to the imports but at a lower level compared to the exports.

According to the results in Fig. 2, appendix A, we notice that for a span of 12 months, 18.08% of the variation of food products and livestock exports is determined by the exchange rate variance, the difference of 81.91% being given by other variables. Regarding the imports, only 12.43% of their variation is determined by the exchange rate variance, while the 87.56% difference is given by other variables. Decomposing the variance we notice that the exports and imports variation is largely explained by self-innovations (shocks). The degree to which the exchange rate shocks influences the exports and imports increases in the long-term.

The impact of the exchange rate variance on the exports and imports of beverages and tobacco

From Fig. 3, appendix A it turns out that the leu devaluation leads to an increase of the value of

beverages and tobacco exports after the first three months, while the imports decrease in the first three months, then they move on an upward trajectory. For a span of 12 months, 33.98% of the variation of beverages and tobacco exports is caused by the national currency devaluation, the 66.01% difference being determined by other exogenous variables. In the case of imports, results indicate that only 2.96% of the variation of beverages and tobacco imports is due to the leu devaluation. Regarding the beverages and tobacco exports the exchange rate has an important influence on their evolution, while the imports are not significantly influenced by an exchange rate shock.

The impact of the exchange rate variance on the exports and imports of manufactured articles

The export evolution for this category responds negatively in the first 5 months after an exchange rate shock, followed by a constant evolution afterwards. The imports of manufactured articles have a negative development on the entire span of 12 months. We notice that the influence of the leu devaluation against the euro has little significance on the variation of exports and imports of manufactured articles (see Fig. 4, appendix A).

The impact of the exchange rate variance on the exports and imports of cars and transport equipment

Fig. 5, appendix A presents a positive trend of the evolution of cars and transport equipment exports after an exchange rate shock. Imports are in decline, peaking three months after the shock took place. For this category of products the export variation is explained in proportion of 31.16% for a span of 12 months after the exchange rate variance, while the imports are not significantly influenced, only by 4.11% according to the results.

The study has demonstrated that the leu devaluation does not lead, in the medium-term, to a substantial increase of the exports. As a mechanism of influence of the international commercial trades, the exchange rate has a short-term influence and the economy requires structural reforms, meant to stimulate the growth of the international competitiveness of goods and services. Moreover, the devaluation alters the international trades, especially the exports, by the loss of external partners and markets.

Conclusions

Under the circumstances of the international financial crisis onset, an increasing number of states have introduced the possibility of the national currency devaluation in order to stimulate exports and grow competitiveness. However, this empirical study shows that in the case of Romania, between the years 2007-2013, the channel of the exchange rate does not have a significant influence on the exports and imports dynamics, as it was analysed on different category of products (see Appendix A, Table no. 1).

It is true that after a period of 2-3 months we notice some trends of growth or decline of the commercial trades, but they are not statistically significant. The two hypotheses have been validated for categories such as food products and livestock and manufactured articles.

The exceptions are the products from the categories beverages and tobacco and cars and transport equipment where the leu devaluation favours the exports' growth. The explanation in the case of beverages and tobacco products is given by the progressive growth of the excises for these products, and regarding the car exports, their evolution is due to the high foreign demand which significantly increased the number of sales. In the case of all the other products, the exchange rate interventions to stimulate exports and limit imports are not significant.

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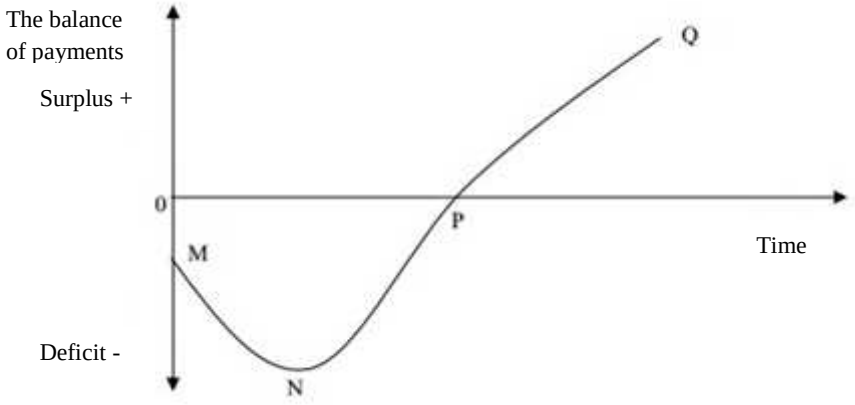
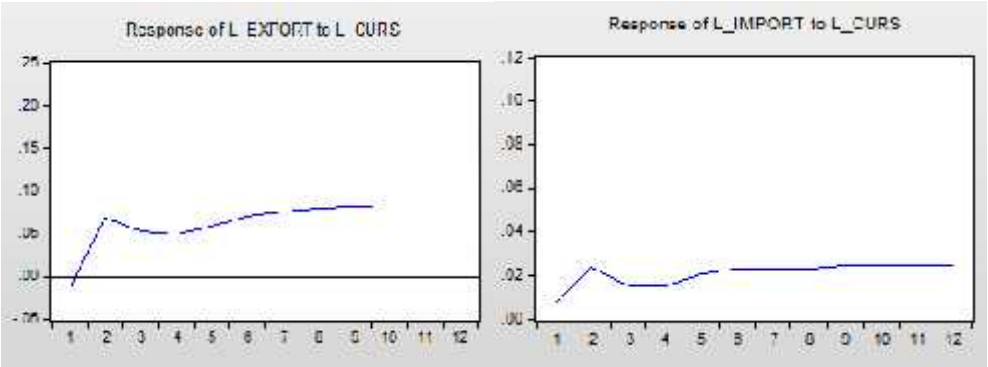
Appendix A

Figure 1 – The J curve



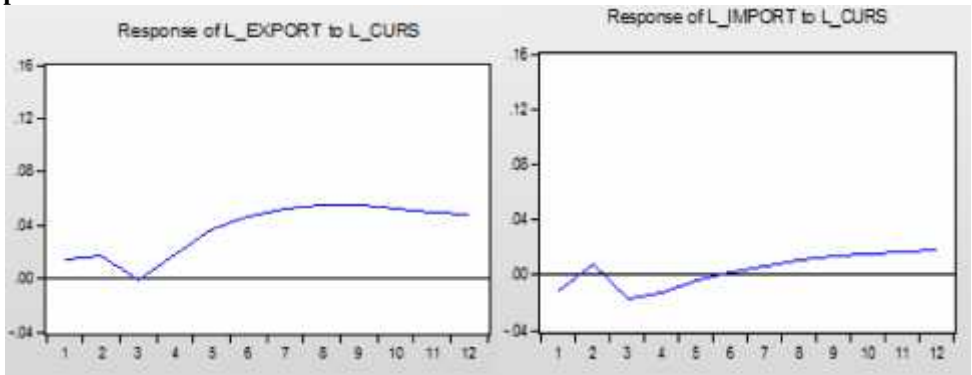
Source: The author's adaptation after I.Ignat, S. Pralea, Op. Cit., 2013, p.169

Figure 2: The exports' and imports' response to an exchange rate shock for the category of food products and livestock



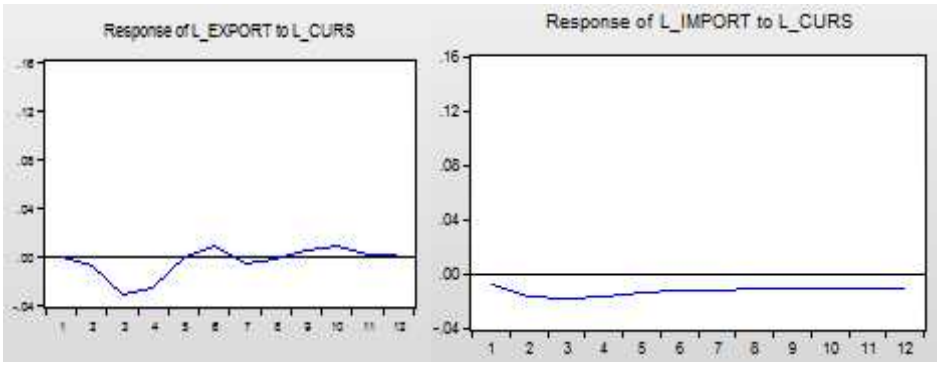
Source: the author's adaptation after INSSE data

Figure 3: The exports' and imports' response to an exchange rate shock for the category of beverages and tobacco products



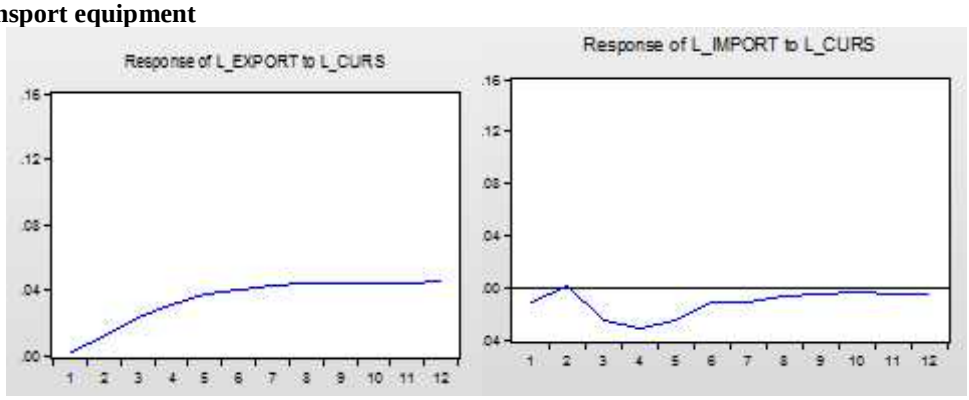
Source: the author's adaptation after INSSE data

Figure 4: The exports' and imports' response to an exchange rate shock for the category of manufactured articles



Source: the author's adaptation after INSSE data

Figure 5: The exports' and imports' response to an exchange rate shock for the category of cars and transport equipment



Source: the author's adaptation after INSSE data

Table number 1: Summarization

Food products and livestock	18.08% of the exports' variation is determined by the exchange rate variance	11,21% of the imports' variation is determined by the exchange rate variance	Hypothesis 1- validated Hypothesis 2- validated
Beverages and tobacco products	33,98% of the exports' variation is determined by the exchange rate variance	2,96% of the imports' variation is determined by the exchange rate variance	Hypothesis 1- invalidated Hypothesis 2- validated
Manufactured articles	2,96% of the exports' variation is determined by the exchange rate variance	5,90% of the imports' variation is determined by the exchange rate variance	Hypothesis 1- validated Hypothesis 2- validated
Cars and transport equipment	31,16% of the exports' variation is determined by the exchange rate variance	4,11% of the imports' variation is determined by the exchange rate variance	Hypothesis 1 - invalidated Hypothesis 2 - validated

Source: the author's adaptation