1 ESTIMATING THE REAL EFFECTIVE EXCHANGE RATE (REER) BY USING THE UNIT LABOR COST (ULC) IN ROMANIA

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Abstract

The real effective exchange rate (REER) is one of the indicators that can provide good information about the competitiveness of a country. However, the computation of REER is not an easy task because of the lack of data in order to compute each country weight. In our paper we compute the weights by taking into account the third market effect according to Turner and Van't Dack's methodology (1993). We use different deflators in order to reveal their effects on the trajectory of the REER and on the competitiveness.

Keywords: real effective exchange rate, unit labor cost, international competitiveness;
JEL Classification: F14, F16, F31.

1. Introduction

The problem of estimating the real effective exchange rate (REER, henceforth) in Romania is extremely important in the context of the European Union (EU, henceforth) integration, as the Romanian economy integrates into an economic area which is founded on competition and in which the price competitiveness is a warranty for continuing to be in the market. In this paper, the authors estimate the REER based on unit labour cost (ULC, henceforth) by using the multilateral exchange rates of Romania with the main partners, both from the EU and outside the EU.

The necessity of determining the REER stems from the fact that, although the competitiveness is one of the permanent interests of the officials, businessmen, and international organizations, only a few studies have considered the competitiveness in Romania through a synthetic indicator like the REER based on ULC. During a PHARE Programme run between 2001 and 2004, Pelinescu and others have computed a REER by taking into account seventeen trade partners. This study extends the previous work by taking into account the third market effect in the weights computations and by using besides the standard deflators (like the consumer price index, CPI, henceforth; the

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producer price index, PPI, henceforth and the Gross Domestic Product deflator, DGDP, henceforth) the ULC in the manufacturing industry.

In this study, we use a methodology which is derived from the standard methodology of estimating REER used by the European Central Bank (ECB, henceforth). We use fixed weights (w_i) determined as an average of five years (2000-2004), by taking into account the third market effect. In order to compute the weights, we use data from official institutions of Romania (National Institute of Statistics and National Bank of Romania), and also data from Eurostat and OECD, the latter ones being obtained from the Internet. All the data was transformed in chained index with a fixed base in 2000.

The structure of the paper is the following: the second section is dedicated to the general methodology of estimating the REER, in which we review the general framework of deriving the REER; the third section describes step by step the actual method of deriving the REER for Romania, including a detailed description of the derivation of the weights; we also analyze the dynamics of the NEER and REER in Romania and discuss the policy implication of the results; the last section states the main findings of this paper.

2. The general methodology of determining the REER

As we have pointed out in the previous studies, Pelinescu (2006), the real effective exchange rate (REER) measures the changes in the competitiveness of a country by taking into account the changes in the relative prices between the countries involved. A growth in the level of this indicator implies a loss of competitiveness. Although the use of the unit labor cost (ULC) implies some disadvantages, Turner and Van't Dack's (1993, p.12) state that for the industrialized countries, "the relative ULC in the manufacturing industry is, probably, the best single indicator." Starting from this statement, we determine for the case of Romania the competitiveness relative to the commercial partners, using in this respect the REER based on the ULC in the manufacturing industry.

The methodology of determining the nominal and effective exchange rate applied by the ECB for the case of the EU is based on a weighted geometric average of the bilateral exchange rates of the euro relative to three sets of commercial partners of the Euro zone. The first set takes into account twelve countries, namely: Australia, Canada, Denmark, Hong Kong, Japan, Norway, Singapore, South Korea, Sweden, Switzerland, United Kingdom and US. The second set adds the ten new EU member states and China, while in the third set there are included altogether 42 countries: those in the second set to which four other candidates and the following countries are added: Algeria, Argentina, Brazil, India, Indonesia, Israel, Malaysia, Mexico, Morocco, New Zealand, Philippines, Russia, South Africa, Taiwan and Thailand.

For the case of Romania, we will consider three sets of partners: first of all the EU countries, except Luxembourg (Austria, Belgium, Denmark, Finland, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden and UK), second, some of the Eastern European countries integrated into the EU in the last enlargement wave (Czech Republic, Hungary and Poland) and a third set which comprises US and Turkey. The choice of these countries was based on taking into account the trade flows of these

countries relative to the overall trade of Romania and also the availability of the statistical data necessary to our study.

The relation through which we determine the REER based on ULC is given by:

$$\text{REER}= \prod_{j \neq i} \left[\frac{C_i RX_i}{C_j RX_j} \right]^{w_{i,j}},$$

Where: j represents the trade partner countries with country *i*, $w_{i,j}$ is the weight of competitiveness attached by country *i* to country *j*, C_i and C_j are the normalized ULC measured in country *i*, and country *j*, respectively, and expressed in the local currency, while RX_i and RX_j represent the nominal effective exchange rates of the country i, and country j, respectively, relative to a global currency (which can be either the US dollar, the euro or the Japanese yen).

There are a few problems associated with this indicator, mainly: a) the determination of a significant structure for the competitiveness weights, b) the elimination or limitation of the cyclical movements of the measure of productivity which is taken into account in the ULC computation and c) the choice of a proper level of disaggregation in the definition of the commodities and of the markets.

In our study, we use the methodology for determining the REER which was also used by the ECB (and also by the Bank of International Settlements, BIS, henceforth), and applied by Buldorini, Markydakis and Thimann (2002), which we present in the following paragraphs.

We started from the determination of the nominal effective exchange rate (NEER, henceforth), by using equation (1):

$$NEER = \prod_{i \in partners} \left(\frac{RX_i}{RX\_Ro} \right)^{w_i} \quad (1)$$

where: *RX_Ro* is the the index of the exchange rate (ROL/EUR), while RX_i stands for the exchange rate of the partener countries relative to the US dollar, *i* represents the main trade partner of Romania, and *wi* is the normalized weight of each trade partner i.

NEER measures the changes in the national currency relative to a basket of currencies (of the trade partners), so that a rise in its level implies a strengthening of the national currency.

In order to determine the REER, we define in a first step the price in the national currency P_{RO_NC}:

$$P_{RO\_NC} = \prod_i (P_i)^{w_i} \quad (2)$$

We define afterwards the index of the price in the national currency, as a ratio of the national price to the effective exchange rate, so that P_{RO} is computed as follows:

$$P_{RO} = \frac{P_{RO\_NC}}{P_r} \quad (3)$$

where P_r is the index of price in Romania.

Finally, we compute the REER as a ratio of the price in the national currency to the price index in equation (3):

$$REER = \frac{NEER}{P_{RO}} \quad (4)$$

The determination of the REER is constrained by several fundamental problems: a) the way the weights w_i are derived, which also implies a discussion about the proper choice of a disaggregation level in defining the commodities and the markets, and b) the choice of the deflator.

a) The determination of the w_i weights

The weighting scheme is essential, as it determines the way each country's ULC and exchange rate influence the competitiveness of the analyzed country, see Turner and Van't Dack's (1993). The solution to this problem implies a proper choice, on the one hand, of the trade partner countries, and on the another hand, of a method to derive the weights.

The choice of the countries and of the relative weights is of utmost importance for the actual level of the REER. Theoretically, it is better that all the countries that engage in trade with the country for which one wishes to determine the competitiveness are taken into account irrespective to the fact whether this relationship is direct or indirect, through the third market. For reasons that are related to the availability of the time series and the time at which the series are published, the number of countries taken into account is smaller, so that we do not take into account those countries with relatively small weights, which influence only in a marginal way the resulting REER.

The theoretical foundations needed to derive the weights were described by Arminton (1969) and Guirk (1987). They prove that, under certain conditions for the elasticities between the supplied goods by different methods on the market, the set of the aggregate competitiveness weights for a country proves to be proportional with the set of elasticities of the demand for those goods of that country, with respect to the relative price of the goods produced by the trade partners. That is why these weights are considered as a reasonable way to tie the changes in the costs within a country and the changes of the costs outside the country to the variability in a country's ability to compete on the international markets.

Regarding the practical way in which the weights are computed, the most usual method is to make use of the trade shares. For the case of the trade competitiveness, it is advisable that the weights represent the total trade flows (both the imports and the exports). However, as Chinn (2002) points out, a pure determination of competitiveeness leads to the elimination of the third market effect. Taking into account this aspect, both EU and IMF methodologies take into account the aggregate competitiveness weights, that is, the effect of the third market relative to the domestic and international market, as in equation (5):

wj = (import of country i/ total trade country i) x (the share of import of country I in the import of country j)
+ (export of country i/total trade country i) x (aggregate share of the export) (5)

where:

aggregate weight of the export = βx(the share of the export of country *i* to the country *j* less the total export *i*) + (*1-β*)x(*the share of the third market*)

The third market weight is given by the weighted average over all third-country markets of country *j*'s import share divided by a weighted average of the combined import share of all country *i*'s competitors, with the weights being the shares of country *i*'s exports to the various markets.

The IMF computes the w_i weights by using a model of the multilateral exchange rates, but usually the countries compute the REERs in a much more restrictive way, and rarely using any kind of weighting scheme from total competitiveness.

The scheme for deriving the weights for the total competitiveness as it is presented by Turner and Van't Dack's (1993, p.20), which we use for the case of Romania, is based on a double weighting of exports together with the bilateral weight of imports, as in equations 6-8:

The weight of imports:

$$w_i^m = m_j^i / m_j \tag{6}$$

The weight of exports:

$$w^x_i = \left(\frac{x_j^i}{x_j}\right)\left(\frac{y_i}{y_i + \sum_h x_h^i}\right) + \sum_{k \neq i}\left(\frac{x_j^k}{x_j}\right)\left(\frac{x_j^k}{y_k + \sum_h x_h^k}\right) \tag{7}$$

Aggregate weights:

$$w_i = \left(\frac{m_j}{x_j + m_j}\right) w_i^m + \left(\frac{x_j}{x_j + m_j}\right) w_i^x \tag{8}$$

where: $x_j^i (m_j^i)$ is the export (import) of country *j* to (from) country *i* ;

$x_j (m_j)$ is the total export (import) of country *j*;

y_i is the internal production of country *j* towards its own market.

It is remarkable that only the internal market is the competition place of different producers. This weighting scheme ensures that the trade partners are weighted in a direct proportion to their participation in the exports and imports of the country for which we determine the competitiveness. In a bilateral weighting scheme, equation (7) can be rewritten as:

$$w_i^x = \frac{x_j^i}{x_j}, \tag{9}$$

while equations (6) and (8) remain the same.

In the global weighting scheme, it is assumed that the individual markets of the countries come together into a single market on which all exporters compete. This assumption leads to a weight that is proportional to the participation of each country in the global competition.

A particular problem is the determination of the output sold on the internal market. Taking into account the lack of accuracy regarding the revenues of the manufacturing industry, Turner and Van't Dack's (1993, p.116-118) suggest the use of the gross added value in

the manufacturing industry for which there are statistical data from the national accounts, and which also has the advantage that excludes the inputs from the imports or from the internal production that are not made in other branches of the industry which are not part of the manufacturing industry. We followed their suggestion in our computations for the case of Romania.

In Turner and Van't Dack's study (1993, p.115), the manufacturing industry is composed by summing up the 5-9 SITC categories. In this paper, we define the manufacturing industry as the sum of 5-8 SITC categories (so that we exclude the category 9, that of other goods), following the work of Buldorini, Makrydakis and Thimann (2002, p.9). In this way, we exclude from the aggregate trade the agricultural goods, the commodities and the energy products.

The IMF experts compute for many countries, especially in Eastern Europe and the former Soviet Union area, the REER indices based on the ULC in which the formula for the competitiveness weight attached by the country *j* to the country *i* is:

$$w_{i,j} = \frac{M_i}{M_i + X_i} s_i^j + \frac{X_i}{M_i + X_i} w_i^j, \tag{10}$$

where: M_i and X_i represent the imports and, exports of country *i*, respectively, s_j^i is the share within the imports of country *i* which come from country *j*, and w_i^j is the share of the exports of country *i* sold in country *j* (the trade with oil and gas is excluded from the total trade with respect to the computation of competitiveness weights, as for the other countries for which REER is computed).

In order to take into account the change in the structure of the trade in the medium and long run, the weights need to be revised at time periods that are not too long even in a fixed weights system.

s_j^i and w_i^j are computed following the next equations:

$$s_j^k = \frac{T_j^k}{\sum_l T_l^k} \tag{11}$$

$$w_j^k = \frac{T_j^k}{\sum_n T_i^k} \tag{12}$$

where: it is supposed that there are *K* markets where the producers from country *i* and country *j*, T_l^k, represent the sales of country *i* on market k, s_j^k represent the market of country *j* on market k while w_j^k represents the share of the output of country *j* sold on the market *k*.

The weight attached to country j by country 1 is given by:

$$w_{i,j} = \frac{\sum_k w_i^k s_j^k}{\sum_k w_l^k (1 - s_i^k)} \tag{13}$$

"This weight can be interpreted as the sum over all the markets of a gauge of the degree of competition between producers of countries *i* and *j* divided by the sum over all the markets of a gauge of the degree of competition between producers of country *i* and all other producers. Under this interpretation, the gauge of the degree of competition between producers of countries *i* and *j* in market *k* is the product of market *k*'s importance for country *i* (measured by the share of country *i*'s output sold in market *k*) times the strength of country *j*'s competitive position in market *k* (measured by country *j*'s market share there); and the gauge of the degree of competition between producers of country *i* and all other producers in market *k* is the product of market *k*'s importance for country *i* times the combined market share of all these other producers in market *k*." (Zanello and Desruelle, 1997, p.8).

In the IMF methodology, the manufactured goods are treated as a composite unique goods with respect to the determination of competitiveness, while the internal trade parts were estimated using the gross output in the manufacturing industry (as it is reported in the national statistics), which is converted into US dollars, and from which total exports are deducted and the final result is expressed as sales out of total manufactured goods sold, including the imports.

The different methods used in the computation of weights and in the estimation of domestic trade lead to different values of the weights (Table 1), sometimes quite close, which allows us to derive some conclusions with respect to the competitiveness of different countries. We can see that the difference between the weights are small between the BIS and the IMF methodologies, and they come, mainly, from the definition of the manufacturing industry and from the different indicators used for computing the internal market (gross added value or adjusted output), the period used (a fixed one in the case of BIS and IMF) or the different weight system in the MERM-IMF.

Table 1

The weights used in the computation of the REER relative to the US Dollar in different international institution (expressed as percentages)

Base period	BIS 1990	IMF	MERM-IMF 1977
Weights of:			
SUA	-	-	-
Japan	31,9	27,1	24,4
Canada	26,6	19,6	23,3
EU (10 countries group-G10)	41,6	53,3	52,3
France	6,7	8,7	11,6
Germany	12,6	15,2	14,9
Italy	5,3	5,9	8,6
UK	8,1	12,6	5,8
Belgium-Luxembourg	2,3	2,9	2,7
Netherlands	2,3	2,9	3,7
Sweden	2,0	2,2	3,1
Switzerland	2,3	2,9	1,9
G10	73,4	95,5	87,3
NIEs (Mexico and other countries from NIE	21,1	-	-

Base period	BIS 1990	IMF	MERM-IMF 1977
Asia			

Source: Table 1, p.25, from Turner and Van't Dack's, "Measuring International Price and Cost Competitiveness", BIS, 1993.

b) The choice of the deflator

In order to answer this problem, the literature investigates a large number of deflators. We used some of them in the 2005 study in order to determine the REER. Thus, the price P used for deflating can be either the consumer price index (CPI), or the industrial price index (PPI) or the unit labor cost (ULC), while the last one can be determined at the level of the whole economy or only for the manufacturing industry. The advantages and disadvantages of using one or another of the deflators were presented more extensively in the previous year study (October 2005 phase). In this study we choose as a deflator the ULC, keeping in mind Turner and Van't Dack's perspective (1993, p.12) with all the implied limits which were noticed in the literature.

The use of the ULC in deflating NEER has the disadvantage, as Nielson (1999) points out, that in this way the capital-labor force ratio is neglected, as it is known that a part of the growth in productivity is due to an increase in the capital intensity, so that only if the decrease in the unit labor costs is higher than the total decrease of the unit cost, the former has a direct impact on the competitiveness. Some other problems related to this indicator are derived from the measurement errors and the large delay in the publication of the data.

The use of the ULC as a deflator raises some problems related to the way the ULC is defined. According to the IMF methodology, the ULC is determined as a ratio of the hourly wage in the manufacturing industry to the hourly productivity. The data is seasonally adjusted and also filtered in order to eliminate the cyclical fluctuations of productivity. The REER based on ULC series from the bilateral exchange rates are published by the IMF in the International Financial Statistics.

Following the EU methodology and the efforts of theorizing the ULC as closer as possible to the methodology of the studies in 2005 October phase (Poenaru and Vasile), the authors determined the ULC in the manufacturing industry by computing the ratio of labor cost of an employee to the gross value added achieved by a employee in the manufacturing industry.

Keeping in mind all these theoretical and methodological aspects, the authors have intended to determine the REER based on ULC by using the multilateral exchange rates of the main partners of Romania from the EU, so as to keep the perspective of the close EU integration of Romania and the necessity to determine the competitiveness of Romania relative to the EU countries.

3. Estimating REER by using ULC in Romania

3.1. A short presentation of the methodology used for deriving the w_i

By applying the relation in equation (1) we constructed for Romania the NEER as follows:

$$NEER = \prod_{i=1}^{N} (e_{i,euro})^{w_i} / e_{ro}$$

where: *N* stands for the number of competing countries from the reference group, $e_{i,euro}$ is the exchange rate of the country *i* currency against euro, e_{ro} is the exchange rate of leu against euro and w_i is the weight of the trade of Romania with country *i*.

This formula, while apparently a simple one, raises difficult problems, especially regarding the w_i weights. Following the recent researches, we chose double weights for the exports and simple weights for the imports. The computation of the double weights for the export has the purpose of revealing the so-called third market effect, as it presented in Turner and Van't Dack's (1993) and Buldorini, Makrydakis and Thimann (2002) studies.

For Romania, the simple weights for the exports were computed using the formula:

$$x_j = x_j^a / \sum_{j=1}^{N} x_j^a$$

where x_j^a stands for the export flows from Romania to country *j*.

In order to compute the third market effect, we computed the double weights for exports for each partner, by the formula:

$$w_i^x = \sum_{j=1}^{N} (S_{i,j} x_j)$$

where each S_{ij} is the share of the supply of country *i* on market *j*, which is derived from the following relation:

$$S_{i,j} = S_{i,j}^a / \sum_{i=1}^{N} S_{i,j}^a$$

where $S_{i,j}^a$ (for $i \neq j$) stands for the net exports of country *i* to country *j* and $S_{i,i}^a$ stands for the internal domestic supply in country *i*.

As it regards the weights for imports, we used simple weights, like in equation:

$$w_i^m = m_i = m_i^a / \sum_{i=1}^{N} m_i^a$$

where m_i represents the import flows to Romania from country *i*.

We computed the aggregate weights by using the following equation:

$$w_i = \left(\frac{x^a}{x^a + m^a}\right) w_i^x + \left(\frac{m^a}{x^a + m^a}\right) w_i^m$$

where $x^a = \sum_{j=1}^{N} x_j^a$ stands for the exports of Romania to the *N* markets, and

$m^a = \sum_{i=1}^{N} m_i^a$ stands for the imports of Romania from the *N* countries.

Table 2 gives the computation basis for each country weights, each column i corresponding to a country in the reference group. The first row in the matrix corresponds to the simple weights of exports of Romania by the destination country. Thus, the first cell tells us that 0.039% of the exports of manufactured goods of Romania were destined to Austria. It is essential to understand that this weight is computed relatively to the total given by the entire reference group, so that it is a normalized weight. The next part of the table consists in the so called supply matrix, which is a symmetric matrix. S_{ij} cell shows the imports of country *j* from country *i*, for $i \neq j$, while the matrix diagonal gives us the internal supply of manufactured goods. Thus the first column gives the structure of the imports of Austria: 42.5 is the share of domestic supply, 1.4 is the share of imports from Belgium, and so on.

The last rows show the double weights for the exports, computed using the data from the supply matrix, namely the aggregate weights considered for the NEER computation, which are constructed using both the double weights of the exports and the simple weights of the imports.

In the construction of weights we chose to use - a common practice in the literature - only the trade of manufactured goods in the 5-8 SITC categories, as it was already mentioned. The weights were maintained constant for all the period for which the REER was computed, and they were computed as averages of the trade flows for the 2000-2004 period. The choice of this period is meant to reveal the changes in the trade flows in Romania after 2000, when the euro was introduced by the National Bank of Romania in the currency basket used for the management of the exchange rate.

The determination of the w_i weights implies a few choices which are arbitrary to a certain degree. A first problem regards the choice of the reference group. Starting from the most important partners, and keeping in mind that we are interested only in the manufactured goods flows, we chose the most important nineteen partners: Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italia, the Netherlands, Poland, Portugal, Spain, Sweden, Turkey, the United Kingdom, the United States. The importance of these partners is relative to the trade with manufactured goods, so that some other important trade partners of Romania, like Russia and Ukraine are missing, as the trade with these countries is mostly with commodities. The significance of this reference group is obvious from the point of view of the share of the trade of Romania with these countries in the total trade of Romania with manufactured goods.

Table 2

The Supply Matrix

	As	Be	Cz	Dk	Fi	Fr	Ge	Gr	Hu	Ir	It	Nl	Pl	Po	Sp	Sw	Tr	UK	USA
wi ex	0,039	0,022	0,006	0,003	0,100	0,001	0,203	0,026	0,042	0,004	0,295	0,040	0,012	0,002	0,017	0,008	0,062	0,078	0,041
As	**0,425**	0,007	0,042	0,009	0,009	0,007	0,032	0,006	0,077	0,003	0,015	0,008	0,014	0,006	0,007	0,009	0,008	0,007	0,001
Be	0,014	**0,120**	0,022	0,025	0,019	0,043	0,034	0,023	0,023	0,019	0,030	0,096	0,019	0,021	0,021	0,030	0,017	0,035	0,003
Cz	0,018	0,006	**0,282**	0,004	0,006	0,004	0,027	0,004	0,024	0,004	0,004	0,007	0,023	0,003	0,003	0,005	0,004	0,004	0,000
Dk	0,004	0,005	0,006	**0,472**	0,018	0,004	0,010	0,004	0,006	0,018	0,003	0,008	0,010	0,003	0,004	0,043	0,003	0,006	0,001
Fi	0,008	0,008	0,006	0,017	**0,517**	0,005	0,008	0,010	0,012	0,008	0,005	0,013	0,012	0,004	0,005	0,037	0,007	0,008	0,001
Fr	0,032	0,137	0,052	0,036	0,036	**0,503**	0,071	0,038	0,051	0,057	0,070	0,058	0,052	0,065	0,104	0,045	0,048	0,054	0,009
Ge	0,308	0,220	0,343	0,156	0,124	0,131	**0,490**	0,086	0,302	0,091	0,126	0,203	0,181	0,105	0,110	0,142	0,105	0,099	0,020
Gr	0,001	0,001	0,001	0,002	0,002	0,001	0,002	**0,603**	0,001	0,001	0,002	0,001	0,001	0,001	0,001	0,001	0,002	0,001	0,000
Hu	0,017	0,008	0,019	0,003	0,007	0,005	0,021	0,003	**0,253**	0,007	0,005	0,009	0,012	0,001	0,004	0,005	0,005	0,003	0,001
Ir	0,005	0,069	0,006	0,008	0,008	0,015	0,023	0,007	0,006	**0,086**	0,011	0,023	0,004	0,005	0,008	0,012	0,006	0,025	0,007
It	0,053	0,045	0,055	0,030	0,032	0,068	0,050	0,083	0,080	0,028	**0,576**	0,030	0,063	0,049	0,060	0,025	0,060	0,033	0,008
Nl	0,020	0,128	0,024	0,043	0,026	0,025	0,041	0,026	0,030	0,040	0,035	**0,269**	0,022	0,030	0,022	0,045	0,016	0,042	0,002
Pl	0,007	0,008	0,033	0,012	0,006	0,006	0,022	0,003	0,025	0,003	0,007	0,010	**0,491**	0,006	0,004	0,014	0,005	0,004	0,000
Po	0,004	0,010	0,002	0,004	0,003	0,008	0,008	0,002	0,003	0,004	0,003	0,005	0,003	**0,481**	0,018	0,003	0,001	0,005	0,001
Sp	0,011	0,021	0,018	0,009	0,011	0,050	0,020	0,024	0,019	0,016	0,027	0,021	0,017	0,168	**0,552**	0,010	0,023	0,021	0,002
Sw	0,011	0,028	0,012	0,082	0,081	0,010	0,013	0,010	0,013	0,012	0,010	0,026	0,019	0,008	0,009	**0,469**	0,011	0,014	0,003
Tr	0,006	0,007	0,005	0,006	0,004	0,006	0,011	0,014	0,007	0,006	0,008	0,008	0,008	0,005	0,006	0,004	**0,612**	0,007	0,001
UK	0,019	0,091	0,036	0,057	0,043	0,047	0,046	0,027	0,033	0,378	0,034	0,077	0,028	0,028	0,039	0,061	0,034	**0,551**	0,011
USA	0,037	0,082	0,037	0,026	0,048	0,061	0,070	0,029	0,035	0,219	0,029	0,126	0,022	0,015	0,023	0,039	0,032	0,081	**0,929**
2wi ex	0,034	0,031	0,012	0,008	0,058	0,06	0,212	0,017	0,019	0,015	0,202	0,043	0,016	0,006	0,03	0,023	0,045	0,081	0,087
wi imp	0,045	0,022	0,028	0,005	0,005	0,099	0,219	0,02	0,039	0,006	0,284	0,026	0,026	0,004	0,025	0,016	0,047	0,052	0,034
wi	**0,04**	**0,026**	**0,021**	**0,007**	**0,029**	**0,081**	**0,216**	**0,019**	**0,03**	**0,01**	**0,247**	**0,034**	**0,022**	**0,005**	**0,027**	**0,019**	**0,046**	**0,065**	**0,057**

where As=Austria, Be=Belgium, Cz=Czech Republic, Dk=Denmark, Fi=Finland, Fr=France, Ge=Germany, Gr=Greece, Hu=Hungary, Ir=Ireland, It= Italy, Nl=Netherlands, Pl=Poland, Po=Portugal, Sp=Spain, Sw=Sweden, Tr=Turkey, UK=United Kingdom, US=United States.

The share of the 19-country group in the aggregate trade of Romania is significant, and it is in a process of steady, though slowly growth, with an average of about 82% for the 2000-2004 period. Although it would have been ideal that the share of the reference group were above 90%, we had to limit the group due to the lack of comparable data regarding the ULC. We also mention that the share of the manufacturing goods (SITC 5-8) in the aggregate trade in the analyzed period represented about 86%. We chose to use a fix weight base for the 2000-2004 period due to the limited access to the data for the exports and imports for all partners in each year of the analyzed period.

A second problem is related to the estimation of the internal supply of manufactured goods. First of all, there should be a consistency between the type of data resulting from the trade flows and the measure of internal production, and at the same time this measure has to be relevant. As we had in mind these restrictions, we considered that the best measure for the internal production is the gross value added in the manufacturing industry sector. This measure does not take into account either the intermediary production or the role of inputs from the imports and the production for the exports. Therefore, we corrected the added value of the manufacturing sector by adding the goods imports of the manufacturing industry and subtracting the exports of the manufacturing industry, the added value resulted being an estimation of the internal supply of manufactured goods.

3.2. Some aspects regarding the dynamics of the REER based on ULC in Romania

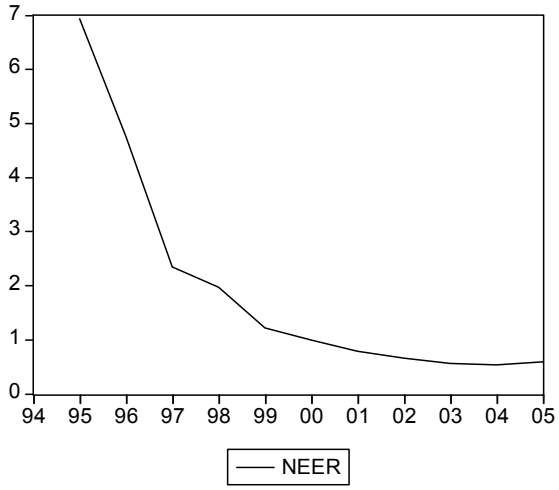
In order to derive the REER based on ULC we used annual data series from the OECD–DATASTREAM, from the Eurostat Statistics for the exchange rates of the trade partners against euro, from the NBR (data from the annual and monthly reports) and from the monthly INS bulletins. The ULC computation for Romania was made by the authors according to the methodology presented by Poenaru and Vasile (2006).

The dynamics of the NEER based on a basket of currencies of the 19 trade partners of Romania shows a continuous tendency of decrease, of nominal depreciation much more pronounced in the period up to 1999, with a clear tendency of slowing down after this year and even one of appreciation after 2005 (with about 11% relative to the previous year), as it results from Figure 1. One may notice that in 2005 the appreciation of the leu relative to the previous year was of only 10.6% relative to the common European currency (as it was the in first year of appreciation after a long period of nominal depreciation) and of 10.7% relative to the US dollar (the second year of appreciation, after a small appreciation in 2004, of about 1.7%). This appreciation led to cheap imports and exports, the former being slightly higher. The acceleration of the inflows of direct investment capital after 2000 (from 1.3 billion euros in 2000 to 5.2 billion euros in 2005) has had a large influence on the NEER appreciation in Romania. Thus, we can consider that the dynamics of the exchange rate relative to the euro and relative to the dollar creates some advantage for the

importers of goods which use the dollar as a reference currency and that after 2005 this dynamics did not sustain the competitiveness anymore.

Figure 1

The Dynamics of the NEER in Romania
(2000=100)



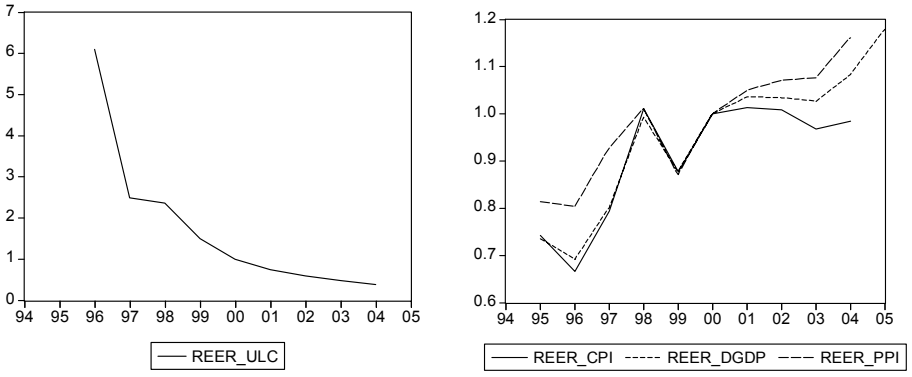
Source: Authors' computations.

The deflating of the NEER by the ULC, considered as the most representative indicator for revealing the dynamics of the competitiveness relative to the trade partners, suggests that the competitiveness has maintained itself relative to the trade partners over the period 1995-2004 (for which there are published data), as it results from Figure 2a. We cannot speak about the same situation when we use other deflators (such as CPI, GDP deflator or PPI), as in Figure 2b, which indicates a loss of competitiveness.

As the NEER from this period indicates a depreciation which supported the national competitiveness, influencing at the same time the REER computed both on the basis of ULC and of other deflators, it results that the different time paths result from the different trends of the relative deflators (as they are defined as the ratio of the deflator used in Romania to the deflator computed as a basket formed by the 19 countries – 1.4a and b and the deflators from the reference countries – Germany, Italy – the main partners of the US, whose currency was the reference currency for the leu until the moment its role was taken up by euro, as of the 3rd of March 2003, according to Pre-Integration Program) whose dynamics for the 1995-2003 period is presented in Figures 3.

Figure 2

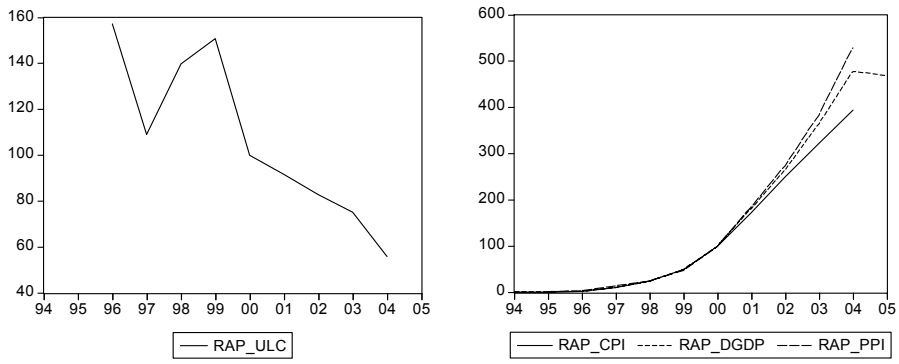
The dynamics of the REER relative to a basket of currencies formed by the currencies of the 19 main trade partners of Romania



a) b)

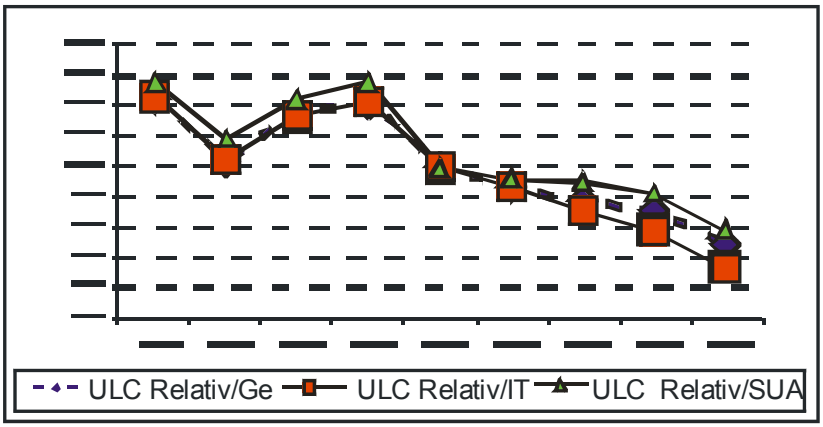
Figure 3

The dynamics of the relative deflators used in the REER computation of Romania (2000=100)



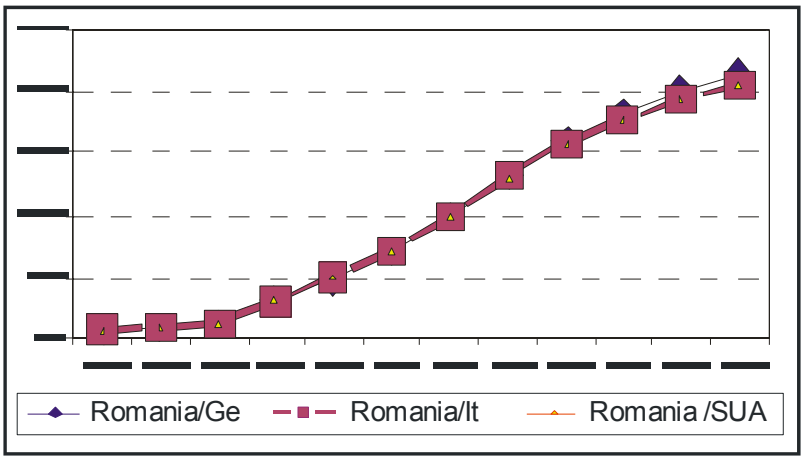
a) The dynamics of the index of ULC b) The dynamics of the index of the other

The dnamics of the index of relative ULC of the labor force (2000=100)



c)

The dynamics of the relative CPI (2000=100)



d)

Source: Authors' Computations.

One may notice that the dynamics of the ratio of deflators for the main trade partners and US (Figures 3c and 3d) follows time paths similar to those of the deflators

computed on the basket (Figures 3a and 3b), with a mention that the slope of the trajectory is descending for the case of the ULC and ascending for the case of the other deflators. This is more significant since although the ULC for Romania is small relative to the trade partners and ensure a comparative advantage for Romania in the manufacturing industry (the REER indicates a depreciation in real terms, Figure 2a), however, the dynamics of the other deflators suggest that this advantage is only partial. We can conclude that in the case of Romania the use of ULC as a deflator it is not as significant as it is in the case of other developed economies, due to the low share of the labor cost in the total cost and, also, due to the high costs with commodities and materials from imports. Keeping in mind the realities of the Romanian economy, we consider that the use of the IPC as a deflator is much more suited for the analysis of competitiveness.

The efforts of disinflation in Romania and the massive inflows of capital have reduced the differences and have attenuated until disappearance these advantages for the whole economy. REER deflated by the CPI, the GDP deflator and the PPI indicates a process of appreciation in real terms, which is equivalent to a loss of competitiveness (Figure 2b). This appreciation is also the result of the Balassa-Samuelson effect, which was revealed also for all the transition countries that joined the EU in the last accession wave. This dynamics draws our attention to the fact that the resources for increasing the competitiveness in the long run are to be found where this competitiveness actually emerges, that is at the micro level of the firms and not at the level of macroeconomic policies, which try to depreciate the real exchange rate.

4. Conclusions

The results suggest that in Romania, whose export is dominated by products coming from imports and with a low added value, the dynamics of the REER based on ULC does not reflect the whole situation of the competitiveness relative to the trade partners, because the labor cost has a significant lower share in the total costs relative to the labor cost share in the total costs of the trade partners.

Thus, the REER based on ULC is less relevant to Romania as a measure of competitiveness, due to the high share of commodities in the manufacturing industry goods which go to exports. Under these conditions, the comparative advantage of the low labor cost in Romania relative to the trade partners is only partial and it reflects the competitiveness only through a cost component which is not dominant in the structure of the exports. This aspect is revealed by the different time paths of the deflators, the ULC, the CPI, the PPI and the GDP deflator.

A factor which should not be neglected at all when analyzing the loss of competitiveness of Romania is the appreciation of the national currency due to the inflows of capital, which is a common phenomenon in other transition economies, too.

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