

Alternative measures of Real Effective Exchange Rate: A Different Story on Price Competitiveness?

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Abstract

The purpose of the paper is to illustrate the importance of the REER calculation in making the inference for the price competitiveness of the economy. Despite the same essence of the calculations used worldwide, there are still many differences with respect to the treatment of the relative prices, selection of the weighting criterion and its time variation, third markets competition, etc. Hence, all these elements could be country-specific. Within the paper, new alternative measures of REER of the Denar are calculated. First, we calculate new measure by changing the country weights in line with the strong recent changes in the trade directions and the structure of the economy. Second, due to the large weight of primary commodities in the Macedonian trade, we calculate alternative measure where these products are excluded when defining country weights. Finally, we try to see the effect of different deflators, and for this purpose an alternative measure using ULC as relative price is calculated. The paper presents the differences among the alternative measures, and how they affect the overall assessment of the price competitiveness of the country. There is no straight answer to the question of which measure of the REER is the best, and when analyzing, the selection of the measure depends upon the economic issue being analyzed.

Key Words: Nominal effective exchange rate, relative prices.

1. Introduction

As a standard measure of price competitiveness of the economy, the real effective exchange rate (REER) is the most frequently used indicator of international competitiveness. The real effective rate is the nominal rate deflated by a similarly weighted average of foreign prices or costs, relative to those in the home country. Despite the same essence of the calculations used worldwide, there are still many differences with respect to the selection of the weighting criterion and its time variation, third markets competition, treatment of the relative prices etc. In other words, although the REER is a very narrow concept of competitiveness, it can be given wide range of statistical forms and none of them is an ideal measure. In this short analysis we focus on two general issues that are often raised in the construction of REER indices: the choice of currencies to be included in the calculation of indices and the choice of price or cost measure. This arises from the fact that different measures can tell a different story on the competitiveness. So, let us see what kind of story could be told in the case of Macedonian currency - Denar by using alternative measures of REER.

2. The REER of the Macedonian Denar – current methodology

The REER of the Denar is calculated by the National Bank of the Republic of Macedonia (NBRM). *It is calculated as a ratio between the NEER index and the index of relative prices.* According to the current official methodology, the *NEER index* of the Denar is calculated as a weighted geometric average of monthly exchange rates of the currencies of 12 countries (see Table 1). The selection of countries and

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their weights follows the ECB approach for more than 2/3 coverage of the foreign trade, as well as the IMF and OECD approach for relatively wider set of currencies and trade partners. Hence, the countries included in the calculation represent the most important trading partners, as well as trading partners that are developed market economies, EU members or EU candidate countries. They represent 74% of total foreign trade in 2006, which is a base year. The weights are fixed, derived from bilateral trade flows. The bilateral weighting scheme is expressed by the following equations:

$$\text{Import weight: } w_i^m = m_j^i / m_j \tag{1}$$

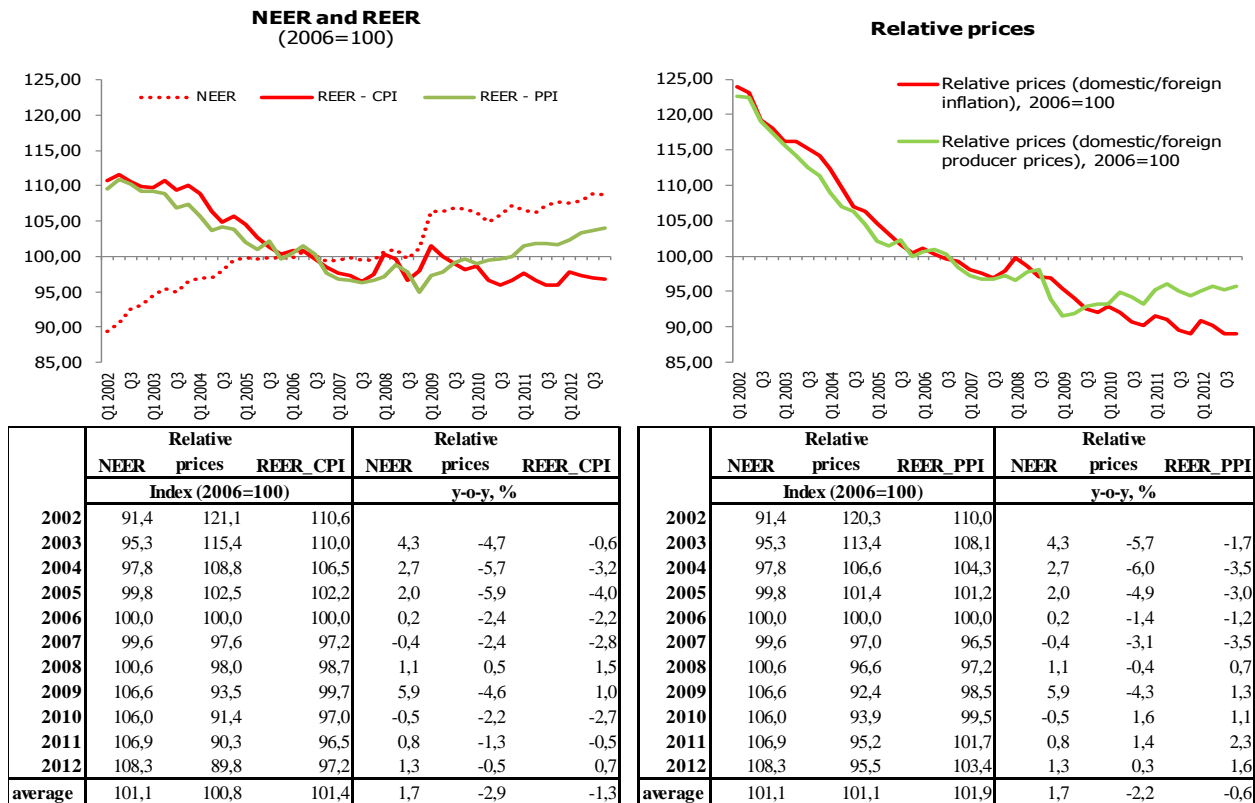
$$\text{Export weight: } w_i^x = x_j^i / x_j \tag{2}$$

$$\text{Overall weight: } w_i = w_i^m * [m_j / (x_j + m_j)] + w_i^x * [x_j / (x_j + m_j)] \tag{3}$$

where x_j^i (m_j^i) represents exports (imports) of country j to (from) country i,
 x_j (m_j) represents total exports (imports) of country j.

The *index of relative prices* is a ratio between the domestic price index and the weighted index of the foreign prices of the selected countries. It shows whether domestic prices are higher or lower than the foreign prices. The current methodology uses two types of deflators: consumer price indices (CPI) and producers' price indices (PPI). The interpretation of the REER index is the following: the level below 100 indicates real depreciation or increased price competitiveness (increased exportability) of the Macedonian economy.

Figure 1



During the past decade, the NEER of the Denar appreciated on average by 1.7%. This is mainly driven by the movements of the Denar against Serbian Dinar and Russian Ruble. However, the favorable movements in relative prices (lower domestic prices compared to the prices in foreign countries), contributed to the depreciation of the REER. The CPI deflated REER depreciated on average by 1.3%, while the PPI deflated REER by 0.6%. But, if we look at the more recent period, the relative producers' prices follow an upward path and the REER, PPI deflated, since 2008 indicates a mild, but continuous real appreciation of domestic currency.

3. New alternative measures

In the recent period, Macedonian economy is experiencing significant structural changes, as well as changes in the trade directions. This process is driven by the new foreign direct investments (FDIs), placed in the existing, but also in completely new activities for the economy. For example, in 2009, important "greenfield" investments from abroad related to the automotive industry entered the Macedonian economy. As export oriented companies, with substantial import component, they caused significant change in the so-called "traditional" structure of the foreign trade, with respect to the most important traded products and the most important trading partners. This effect was especially pronounced in the last two years.

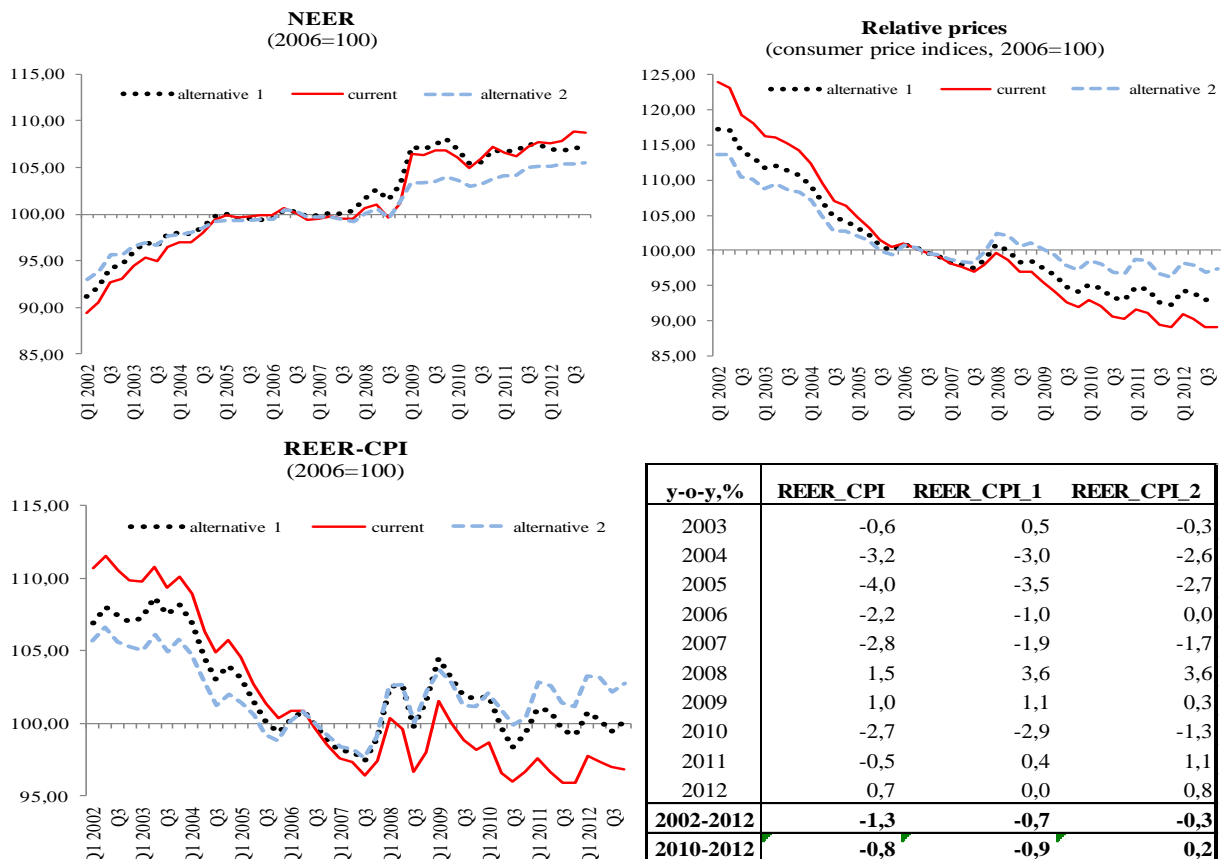
The literature suggests that the assessment of the most recent movements in the EERs should be based on the most recent pattern of trade. Hence, *the first alternative measure of the REER tries to assess the impact of the most recent changes in the foreign trade structure on the price competitiveness of the economy*. For the calculation of this alternative measure, 2011-2012 data on foreign trade is used as a base for selection of the countries and for derivation of the weights (instead 2006). Looking at bilateral trade flows during this period, 14 most important trading partners are selected, which represent 71% of total foreign trade in 2011-2012 (see Table 1). This shows a slight improvement in trade diversification, although the first top five countries still remain the same. Correspondingly, the basket of currencies is also widened. These countries and their weights are used in construction of an alternative NEER and an alternative index of relative consumer prices (CPI deflator), presented in chart 2. The new NEER shows slightly smaller appreciation compared to the currently measured one, especially in the last period of observation. But, on the other hand, new relative consumer prices reveal less favorable changes than in the current methodology. As a result, the new REER shows smaller improvement in price competitiveness compared to the current official measure (figure 2, alternative 1).

Specific feature of the Macedonian trade structure is the big proportion of raw materials and primary commodities in total foreign trade. The prices of these so-called "homogeneous" goods are mainly defined by demand and supply at the world markets, and their producers cannot sustain a price that is different from those of the competitors, hence, the price convergence is very rapid. Consequently, the changes in the exchange rates in most of the cases are not affecting the price of these products (unless it is a case of a country that is dominating the market). For these reasons, *the calculation of the second alternative measure of the REER is not considering the trade with these products (in our case: oil and oil derivatives, iron and steel, platinum)*. The weights are again derived from 2011-2012, as a base period. The pool of countries in this case is even more diversified, but they still account for 71% of total foreign trade (see Table 1). The calculations in this case show much smaller appreciation of the NEER, as well as much smaller favorable effect from the relative price ratio. So, the improvement in price competitiveness according to this new measure is very small, and the movement of the REER index during the whole period of observation is smoother. Also, it signals a certain deterioration of price competitiveness in the last two years, because the price ratio in this period shows that domestic prices are moving in line with foreign prices, while NEER appreciates (figure 2, alternative 2).

Table 1

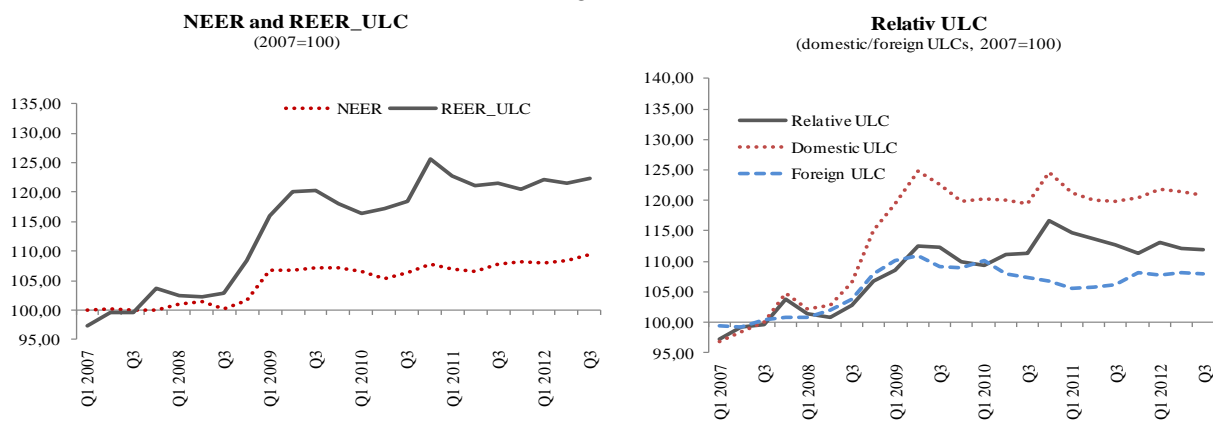
current measure		alternative 1		alternative 2	
Countries	weights 2006	Countries	weights 2011-2012	Countries	weights 2011-2012
Serbia	17,7	Germany	24,8	Germany	35,3
Germany	16,4	Serbia	10,4	Serbia	11,1
Greece	14,4	Greece	11,4	Italy	10,1
Russia	14,2	Bulgaria	9,4	Greece	6,8
Italy	10,1	Italy	8,9	Turkey	6,3
Bulgaria	8,6	UK	8,1	Bulgaria	6,1
Croatia	4,3	Russia	6,9	Croatia	3,8
Turkey	4,0	Turkey	5,1	Slovenia	3,7
Slovenia	3,9	Slovenia	3,2	Austria	3,0
Netherlands	2,6	Croatia	3,2	UK	2,9
Austria	2,2	Switzerland	2,4	Netherlands	2,3
USA	1,4	Ukraine	2,3	France	2,0
		Austria	2,2	USA	1,9
		USA	1,7	Poland	1,9
				Albania	1,4
				Belgium	1,4
% of total trade 73,6		% of total trade 70,7		% of total trade 70,8	
Basket of currencies					
EUR		EUR		EUR	
USD		USD		USD	
TRY		GBP		GBP	
DIN		CHF		TRY	
RUB		TRY		DIN	
BGL		DIN		BGL	
HRK		RUB		HRK	
		BGL		ALL	
		HRK		PLN	
		UAH			

Figure 2



In addition to price measures, wide range of cost indicators is used to construct REER. Statistical convenience and the availability of fairly comparable data for many countries are in general the main reason for the use of unit labor costs (ULCs) in assessing the competitiveness of the country. In order to see how different deflators affect the overall assessment on competitiveness, additional effort has been made to construct another alternative measure for the REER of the Denar that will take into account cost competitiveness. *The third alternative measure of REER of the Denar uses the relative unit labor costs as deflator.* For more comprehensive comparison, the new deflator is applied to the same NEER (with respect to structure of countries and their weights) as in the current methodology (already explained in the text above). The relative ULCs were constructed using data from different sources, mainly Eurostat and ECB, as well as national central banks and national statistical offices. They refer to the whole economy (due to data limitations, for Turkey and Serbia the ULC in manufacturing sector is used, as a proxy for the whole economy). The availability of data limited the period of observation between 2007:q1 and 2012:q3. *The results from the new measure indicate worsened competitiveness of domestically produced goods at foreign markets by 4.2%, on average, for the observed period.* This is due to the appreciation of the NEER, amplified by unfavorable relative costs, due to higher domestic than foreign ULCs. However, certain improvement can be noticed in the movement of relative costs since 2010, especially in the last year of observation (although, we should have in mind that the data refers only for the first three quarters of the year).

Figure 3



	Relative costs			Relative costs		
	NEER	REER_ULC	Relative costs	NEER	REER_ULC	Relative costs
	2007 = 100			y-o-y, %		
2007	100,0	100,0	100,0			
2008	101,1	102,9	104,0	1,1	2,9	4,0
2009	107,0	110,8	118,6	5,9	7,7	14,0
2010	106,5	112,1	119,4	-0,5	1,2	0,7
2011	107,4	113,1	121,4	0,8	0,9	1,7
q1-q3 2012	108,6	112,4	122,0	1,1	-0,6	0,5
average	105,1	108,6	114,3	1,7	2,4	4,2

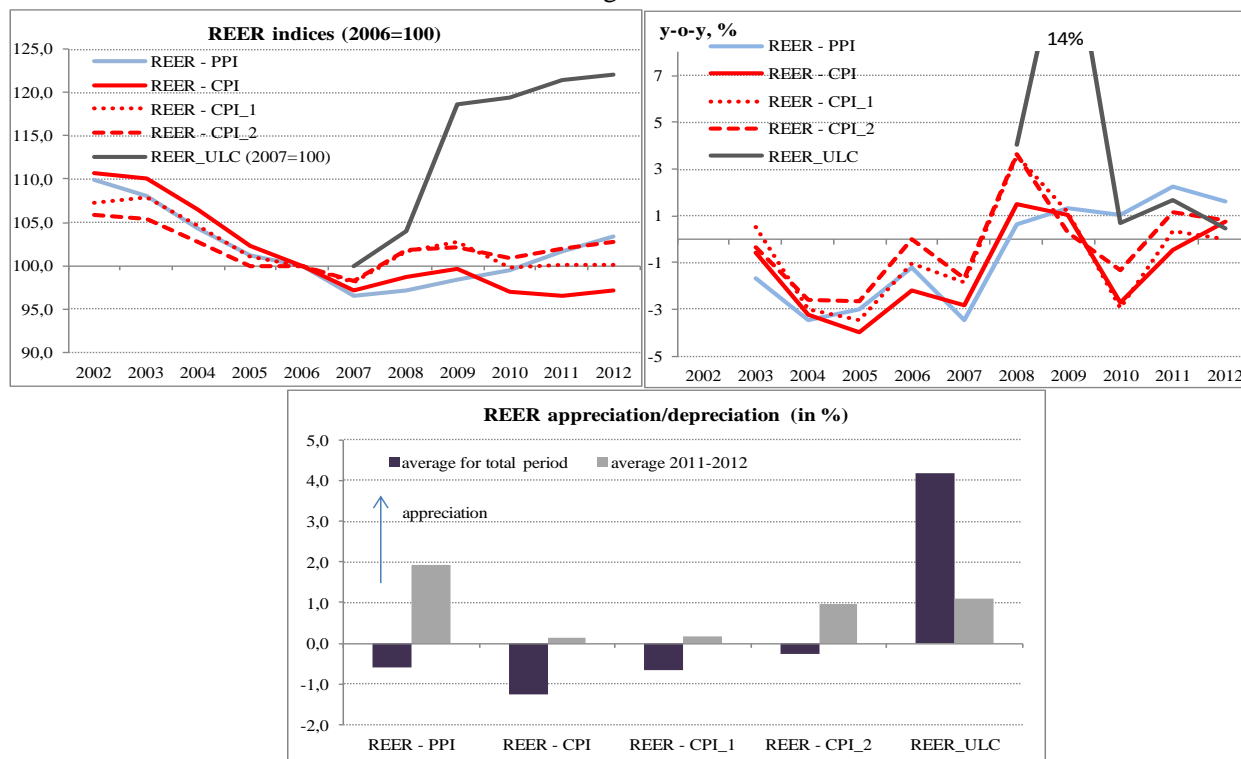
4. Conclusions

According to the overall results presented in this paper, on average for the whole period of observation, indicators based on price deflators are showing increased competitiveness. Compared to the existing price measures, the new alternative measures indicate that the gain in competitiveness would be/is much smaller if we take most recent trade pattern (2011-2012), and if we exclude the trade with "homogenous"

goods. But, if we look at the most recent period, all indicators point in the opposite direction. Furthermore, the loss in competitiveness is getting worse as we take most recent trade pattern and if we do not take into consideration the trade with homogenous goods.

The new measure which takes into account the labor costs differences with other countries (cost competitiveness) shows that our country is less competitive compared to its most important trading partners, on average for the whole period of observation. However, this discrepancy is narrowing in the most recent period.

Figure 4



Having in mind that there is no single appropriate neither superior measure of REER, we should not stop here. In order to get more comprehensive view on the external competitiveness, it is necessary also to include the effect of "third-markets" competition and double-weighting scheme, or to look in deeper whether the basket includes high-inflationary currencies that might lead to misleading conclusions.

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