

Introduction

The aim of this note is to give a brief description of the multilateral trade weighted real exchange rate index, TRTWIN1, published by REUTERS-Istanbul. The index is designed and maintained by Faruk Selçuk, Bilkent University, Ankara.

TRTWIN1

Purchasing power parity (PPP) is an essential concept in an open economy for at least two reasons. First, it is a benchmark to judge the level of an exchange rate. Without PPP, there would be no way of discussing the over- or under valuation. The second use of PPP is to serve as a prediction model for exchange rates. Therefore, the real exchange rate series for different countries are now routinely calculated by international organizations, governments, and financial institutions.

Reuters has started publishing a multilateral trade weighted real exchange rate index for Turkish Lira in 1995 (TRTWIN). After the introduction of the Euro, this index is replaced by TRTWIN.¹

Calculation

Let p_d and p_f represent the price of a standard market basket of goods at home (Turkey) and abroad (USA) stated in home and foreign currency respectively. Let e represent the exchange rate as the number of units of domestic currency per unit of foreign money (TL per US Dollar).

The strong version of the Purchasing Power Parity (PPP) relies on the “law of one price”:

$$e = \frac{P_d}{P_f} = \frac{\text{TL price of a standard market basket of goods}}{\text{US Dollar price of the same standard basket}}$$

The implication of the strong version of PPP is that regardless the monetary or real disturbances in the economy, the prices of a common market basket of goods in two countries, measured in a common currency will be the same at all times ($1.0 = \frac{P_d}{P_f * e}$)

TRTWIN1 utilizes the same formula used in calculation of the TRTWIN, based on the above equation. According to this formula, an increase in the

¹These two indices have different normalization dates (base years). Users who would like to use both indices should be careful about the base year change.

index represents an overall real appreciation of the Turkish Lira while a decrease indicates a real depreciation.²

$$TRTWIN1_t = \left[(w * INX_t) + \frac{(1 - w)}{INM_t} \right] * 100$$

where

$$INX_t = \sum \left(\frac{x_i}{\sum x_i} \right) \left(\frac{e_{i0}}{e_{it}} \right) \left(\frac{p_{dt}}{P_{it}} \right),$$

$$INM_t = \sum \left(\frac{m_j}{\sum m_j} \right) \left(\frac{e_{jt}}{e_{j0}} \right) \left(\frac{p_{jt}}{P_{dt}} \right),$$

$$w = \frac{\sum x_i}{\sum x_i + \sum m_j}$$

$$i = 1, 2, \dots, T, \text{ and } j = 1, 2 \dots N$$

Here x_i is the total exports of Turkey to country i , m_j is the total imports from country j to Turkey, all measured in the US dollars. Exchange rates, e_i and e_j , are the nominal exchange rates between Turkish Lira and country i and j currencies respectively. Price levels, p_{it} and p_{jt} , are the price indices in country i and j . Turkish price level is denoted by p_{dt} . T and N are the total number of trade partners in exports and imports of Turkey.

Ideally, all the trade partners should be included in a multilateral trade weighted real exchange index. However it is almost impossible to construct such an index in practice. The currencies included in TRTWIN1 are the US dollar (USD), the Euro (EUR), the Japanese Yen (JPY), and the British Pound (GBP). These four currency zones have approximately 60 percent share in Turkish foreign trade as of 1998. We assume that the currencies of other trade partners of Turkey do not appreciate or depreciate (in real terms) on the average against the equally weighted basket of the US dollar and the Euro.

All relevant variables are normalized to 1 as of June 1999 so that the index value at June 1999 is 100.³

²A more detailed discussion of the exchange rate indices and their calculation methods can be found in Rhomberg (1976) and McMillin (1993).

³There is a common misconception about the base year in interpreting different indices. It is true that the base year may induce some bias in consumer or wholesale price indices. This is because the weights of each commodity or service in the index are calculated for the base year and they are not updated for a certain period of time. Therefore, a consumer

TRTWIN1 series are calculated on monthly bases starting January 1999. The index will be updated during the first week of every month.

Data Sources:

Exchange Rates:

Monthly Average of Daily Bid-Ask rates, *Reuters*

Prices:

Euro: Euro-zone Producer Price Index, *Eurostat*

Great Britain: Producer Prices, *Government Statistical Service, UK*

Japan: Domestic Wholesale Price Index, *Bank of Japan*

Turkey: Wholesale Price Index, *State Institute of Statistics, Turkey*

USA: Producer Price Index, *Bureau of Labor Statistics, USA*

price index or a wholesale price index may give misleading results as one moves away from the base year.

However, a potential bias because of the base year selection is not true for some other indices, such as TRTWIN1. It should be clear from the given equation that the index takes 100 value as of June 1999 as a matter of normalization. Note that The weight of each currency in TRTWIN1 will be updated every second year and the new index results will be chained to the latest index numbers.