■ effective exchange rate

The effective exchange rate is a summary measure of the rate at which a country's currency exchanges for a basket of other currencies, in either nominal or real terms. Effective exchange rates become relevant when a country conducts trade and investment transactions with a number of other countries. These rates can vary along several dimensions, including country coverage, weighting, and whether or not the effect of inflation is taken into account (i.e., the distinction between nominal and real). The final selection of the appropriate definition and calculation of the effective exchange rate depends on a rather complicated interplay of the theoretical model of interest and data availability and reliability.

The first issue to confront in calculating an effective exchange rate is how to attribute relative weights to each of the partner currencies. In many circumstances, the exchange rate plays the role of a relative price of traded goods; hence, the relevant weights involve trade weights. Asset trade has become more prominent in recent decades, suggesting that the appropriate weights may be related to the assets owed by, or liabilities owed to, other countries.

Trade-Weighted Effective Exchange Rates By far the most common means of calculating an effective exchange rate is to weight the currencies by trade weights. To fix concepts, consider a geometrically weighted average of bilateral exchange rates.

$$s_t^{effective} \equiv \sum_{j=1}^{n} w_j s_t^j \tag{1}$$

$$q_t^{effective} \equiv \sum_{j=1}^{n} w_j q_t^j \tag{2}$$

where $s^j (q^j)$ denotes the log nominal (real) exchange rate relative to country j. The weights w_j are usually based on bilateral trade volumes (the sum of exports and imports, expressed as a proportion of total exports and imports).

Trade weighting can take on a more complicated form to allow for competition in third markets, however. This goal is usually accomplished by adopting the Armington (1969) assumption that goods are differentiated by location of production. The third market weight is equal to 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 of country i's competitors, with the weights being the shares of country i's exports to the various markets. This simple expression is based on the assumption that all the differentiated goods share the same constant elasticity of substitution, which may not necessarily be appropriate in all instances (Spilimbergo and Vamvakidis 2003). For instance, goods originating from less-developed countries may not be equally substitutable with goods originating from industrial countries. Moreover, these weights can change over time continuously or discretely and infrequently, with the choice depending in large part on the trade-off between convenience and accuracy.

Nominal versus Real Often the economist will encounter a model wherein the real, or inflation-adjusted, exchange rate plays a central role. There are a number of real exchange rates, or "relative prices," that appear in the literature, however, so there is

ample scope for confusion. A decomposition of the most standard definition is useful. In this definition, the real exchange rate is given by:

$$q_t \equiv s_t - p_t + p_t^* \quad (3)$$

where s is the log exchange rate defined in units of home currency per unit of foreign currency.

Most models of the real exchange rate can be categorized according to which specific relative price serves as the object of focus. If the relative price of nontradables is key, then using a broad price index encompassing tradables and nontradables is implied. One example of the use of a broad index is in productivity-based explanations of the real exchange rate such as the Balassa-Samuelson model. If, on the other hand, external balance (i.e., current account balance) is of paramount concern, some narrower index of traded goods may be the appropriate deflator. This variable is also what macroeconomic policymakers often allude to as price competitiveness—a weaker domestic currency (in real terms) means that it is easier to sell domestic goods abroad. A related concept is cost competitiveness. Assuming a cost-markup model of pricing (i.e., prices equal some markup over cost), one can calculate a measure of the real effective exchange rate where unit labor costs are used instead of prices (Golub 1994). This real exchange rate is best thought of as a measure of the relative *production cost*—rather than price—of goods.

In practice, one has a choice of only a few price deflators. At the monthly frequency, they include the consumer price index (CPI), the producer price index (PPI) or wholesale price index (WPI), or the export price index. At lower frequencies, such as quarterly data, the set of deflators increases somewhat, to include the gross domestic product (GDP) deflator and price indexes for the components of GDP, such as the personal consumption expenditure deflator. Typically, the CPI weights nontraded goods such as consumer services fairly heavily. Similarly, the GDP deflator and the CPI will weight expenditures on nontradables in proportion to their importance in the aggregate economy. In contrast, the PPI and WPI exclude many retail sales services that are likely to be nontraded.

The unit labor cost deflated index is in a sense the most relevant for many issues related to trade, as unit labor costs are a measure of cost competitiveness. Unfortunately, there are many difficulties with using such indexes. First, unit labor costs (ULCs) are not always available on a timely or consistent basis, and are subject to substantial revisions. Second, their greater covariation with the business cycle impedes discerning trends in the ULC deflated series. Third, measured ULCs usually pertain only to manufacturing sectors, and given the increasing tradability of services, measured ULCs may provide misleading inferences. Fourth and perhaps most important, ULCs are typically available on a consistent basis for developed economies, so that ULC deflated effective exchange rates can be calculated only against a reference group of countries that may not, in the end, be the relevant group.

Asset and Liability Weights In the preceding discussion, it has been taken as a given that the appropriate weights are those associated with trade flows. Yet there is no reason why trade weighting should be appropriate for all questions. The economists Cedric Tille, Hélène Rey, and Pierre-Olivier Gourinchas have pointed out that exchange rate changes have had substantial effects on the net international investment position of the United States. Tille (2003) noted that because U.S. assets are predominantly denominated in foreign currencies, while U.S. liabilities are mostly denominated in dollars, dollar depreciation induces a large upward effect on the dollar valuation of U.S. foreign assets. Hence, over the short to medium term, the net international investment position is heavily influenced by dollar movements.

See also Balassa-Samuelson effect; band, basket, and crawl (BBC); equilibrium exchange rate; exchange rate forecasting; exchange rate regimes; exchange rate volatility; nontraded goods; purchasing power parity; real exchange rate

FURTHER READING

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