316-632 INTERNATIONAL MONETARY ECONOMICS NOTE 5a

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Notes on international relative prices

This note discusses some important concepts that arise frequently in international macroeconomics. Over the coming weeks, we will discuss both theoretical and empirical aspects of international relative prices, with a focus on the large discrepancy between theory and data.

- **Nominal exchange rate**: The relative price of two *currencies*. In academic work, the usual convention is that nominal exchange rates are reported as the price of foreign currency in terms of domestic currency. For example, if it takes \$1.42 AUD to buy \$1.00 USD, the nominal exchange rate is $\mathcal{E} = 1.42$. In this notation, *a nominal depreciation is a rise in* $\mathcal{E}$. When the local currency is depreciated, it takes more local currency to buy the same amount of foreign currency. Newspapers often report nominal exchange rates as the price of domestic currency in terms of foreign currency, so they might report that \$1.00 AUD buys \$0.70 USD (for example).
- **Law of one price**: A given commodity "should" sell for the same price everywhere. That is, if P_{wheat} is the price of wheat in AUD and P^*_{wheat} is the price of wheat in USD, the law of one price tells us to expect

$$P_{\text{wheat}} = \mathcal{E} P^*_{\text{wheat}}$$

  where $\mathcal{E}$ is the nominal exchange rate. If goods markers were frictionless, this relationship would be enforced by arbitrage. In reality, the law of one price dramatically fails for numerous reasons — not least of which are the existence of trade barriers and transportation costs.
- **Non-traded goods**. Commodities for which transportation costs are so high as to make trade unprofitable. The classic example is "a haircut", but empirically more important examples are construction and housing and other such services. Most traded goods involve at least some non-traded input.
- **Price levels**: Suppose we have a fixed basket of commodities (i.e., more than one commodity). The price level is the domestic price of that fixed basket in terms of a given numeraire. If that numeraire is domestic currency, say Australian dollars, we refer to a *nominal price level*. If the numeraire is itself some particular commodity, say apples, we refer to a *real price level*. In economic models, it is standard to use a traded good as a numeraire for real price levels.

- **Real exchange rate**: The real exchange rate is the relative price of *a fixed basket of commodities*. If P and $\mathcal{E}P^*$ denote the price levels of two countries measure in a common numeraire (in this case domestic currency), then the real exchange rate may be defined as

$$\mathcal{Q} \equiv \mathcal{E}\frac{P^*}{P}$$

  Again, this means that *a real depreciation is a rise in* $\mathcal{Q}$. When the real exchange rate is depreciated, it costs more to buy the same basket of goods at home. Not everyone defines the real exchange rate in this way. Mussa (1986), for example, defines the real exchange rate to be $1/\mathcal{Q}$.

- **Purchasing power parity**: The PPP hypothesis comes in two forms. First, *absolute PPP* is the hypothesis that real exchange rates are $\mathcal{Q} = 1$. Equivalently,

$$P = \mathcal{E}P^*$$

  A fixed basket of commodities costs the same everywhere. Thus PPP is the macro analog for a basket of commodities to the law of one price for a single commodity. For a number of practical reasons, absolute PPP is difficult to test. For example, the basket of commodities used by different countries to construct national price indices varies considerably, so its not always possible to keep the numeraire fixed. Moreover, national price level data come in the form of index numbers (relative to some base year) and we don't usually know whether PPP actually held in the base year itself. The second form is *relative PPP*, which is the hypothesis that the real exchange rate is constant $\Delta\mathcal{Q} = 0$.

- **Terms of trade**: For a given country, the terms of trade is the ratio of an export price index to an import price index.

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9 August 2004

Revised 20 October 2004