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A PRIMER ON EXCHANGE RATES

This primer explains some of the language surrounding exchange rates and also identifies forces that are thought to help determine exchange rates and how they move through time.

What is an Exchange Rate? The number of units of a foreign currency that you can exchange for a unit of domestic currency is called a *nominal exchange rate* or simply an *exchange rate*. Currently, for example, one U.S. dollar can be traded, or exchanged, for around 120 Japanese *yen* (¥). Equivalently, 120 Japanese yen can be used to purchase one dollar. This can be summed up by saying that the dollar-yen exchange rate is 120.¹

The *nominal exchange rate* between two currencies is the number of units of foreign currency that can be purchased with one unit of the domestic currency.

The *real exchange rate* is the number of foreign goods you can get in exchange for one domestic good.

Knowing how much foreign currency you get by trading a dollar does not provide enough information to tell you about the purchasing power of the dollar relative to that of the foreign currency. When trading currencies, people are ultimately interested in the quantity of goods they get using the foreign currency relative to the quantity they could get using the dollar. That is, they are interested in the relative purchasing power of a dollar and a unit of foreign currency. Using relative prices of goods across countries to adjust the nominal exchange rate provides the relevant information and gives a measure called the *real exchange rate*. The real exchange rate is the number of foreign goods you can get in exchange for one domestic good.

For example, consider a world in which only cheeseburgers are produced and traded. Suppose that one cheeseburger costs \$2 in the U.S. and ¥120 in Japan. If the nominal exchange rate is 120, then you can get ¥120 per \$1, and ¥240 can be obtained by trading \$2. ¥240 yen can buy two cheeseburgers in Japan (each costs ¥120) while the \$2 you use to purchase ¥240 could be used to purchase one cheeseburger in the U.S. This means that you can get two Japanese cheeseburgers in exchange for one U.S. cheeseburger, so the real exchange rate is two Japanese cheeseburgers per U.S. cheeseburger.

What are Currency Appreciations and Depreciations? If nominal exchange rates change so that one dollar buys more yen, then the dollar has *appreciated* in nominal terms. And the yen has correspondingly *depreciated* in nominal terms because a yen can buy fewer U.S. dollars.

If the real exchange rate between the U.S. and Japan changes, which can occur because of changes in the nominal exchange rate or relative goods prices in the two countries, or both, then there is a real (purchasing power) appreciation of one currency relative to the other. For example, if cheeseburger prices fall in Japan and everything else stays constant, then by selling U.S. cheeseburgers for dollars, selling those dollars for Japanese yen, and purchasing Japanese cheeseburgers, you now will be able to buy more Japanese cheeseburgers than before. In that case, there is a *real appreciation* of the dollar relative to the yen—a given quantity of U.S. goods can be exchanged for more Japanese goods.

¹ Two types of exchange rates that are often discussed are *bilateral* and *trade-weighted exchange rates*. Bilateral nominal and real exchange rates express how many units of another country's currency or goods, respectively, trade for a unit of a specific country's currency or goods (e.g., how many yen or Japanese goods can be traded for a U.S. dollar or good). Trade-weighted nominal and real exchange rates are multilateral exchange rates which express how many units of a weighted average of currency or goods, respectively, of a country's trade partners can be exchanged for a unit of a specific country's currency or goods, with weights for the trade partners based on volumes of trade that a country undertakes with those partners (i.e., volumes of imports and exports).

Correspondingly, since Japanese individuals now get fewer U.S. cheeseburgers per Japanese cheeseburger, there is a *real depreciation* of the yen relative to the dollar—a given quantity of Japanese goods can be exchanged for fewer U.S. goods.

What Determines Exchange Rates? Nominal exchange rates are determined by supply and demand in the *foreign exchange market*—the market for international currencies. Suppliers and demanders of currencies trade in the foreign exchange market, and trading determines prices (i.e., nominal exchange rates).² For example, in determining the exchange rate between the dollar and the yen, suppliers and demanders of dollars and yen interact to determine how many yen they are willing to exchange to obtain a dollar and, correspondingly, how many dollars they require to give up a yen.

The exchange rate between the dollar and the yen varies from minute to minute as participants in the foreign exchange markets adjust the amounts of currencies they demand from and supply to the market. Those adjustments are responses to changes in economic conditions or news that might influence future conditions. Economic conditions that seem most relevant to exchange rate determination include relative interest rates, inflation rates, and output-growth rates across countries.

Who Demands and Who Supplies Currencies in the Foreign Exchange Market? There are many players in foreign exchange markets. Consider the exchange rate between the dollar and the yen. Who demands yen and supplies dollars? The list includes:

- U.S. companies that import from Japan. They have dollars but need yen to purchase goods produced in Japan and imported to the U.S.
- U.S. investors who invest in Japanese assets. They have dollars but need yen to purchase assets that are denominated in yen.
- Speculators who have dollars but want yen because they believe the yen will appreciate.
- Japanese companies who remit dollar profits back from U.S. operations to headquarters in Japan and want to convert them to yen.
- Japan’s Ministry of Finance, if it is trying to elevate the value of the yen in terms of the number of dollars a yen can purchase.³

On the other side of the market, who demands dollars and supplies yen? The list includes:

- Japanese companies that import from the U.S. They have yen but need dollars to purchase goods produced in the U.S. and imported to Japan.
- Japanese investors who invest in the U.S. They have yen but need dollars to purchase assets denominated in dollars.
- Speculators who have yen but want dollars because they believe the dollar will appreciate.
- U.S. companies who remit yen profits back to the U.S. and want to convert them into dollars.
- Japan’s Ministry of Finance, if it is trying to reduce the value of the yen in terms of the number of dollars a yen can purchase.

Together, the forces identified above determine exchange rates in foreign exchange markets in which over one-trillion dollars changes hand each day.

² There are really two important types of currency markets; spot markets and forward markets. In spot markets, trades are made and currencies are converted on the same day. The nominal exchange rate determined in a spot market is called the *spot rate*. In forward markets, a contract is negotiated today, but the actual currency conversion takes place at a date in the future (usually 20, 60, 90, or 180 days forward into the future). The nominal exchange rate determined in a forward market gives the number of units of one currency it takes to have a unit of another delivered at a future date, something called the *forward rate*. Forward markets allow exporters and importers to protect against risks of future exchange rate movements.

³ Were the Japanese authorities attempting to fix, or “peg,” the value of the yen to the dollar or institute a “crawling peg” consisting of attempted planned growth of the exchange rate, it would intervene heavily in the foreign exchange market to try to significantly influence supply and demand conditions. There is no evidence the Japanese authorities have engaged in such intervention in recent years. Other countries, like China, do actively intervene in attempts at managing exchange rates. This article does not discuss currency pegging.