

Imagine a world of 2 currencies: can one appreciate while the other stays constant?

Spot rates:

The *nominal* exchange:

- Soit il représente la valeur en unités de monnaie étrangère d'une unité de monnaie domestique. Cotation au certain du point de vue de la monnaie domestique
- Soit il représente la valeur en unités de monnaie domestique d'une unité de monnaie étrangère. Cotation à l'incertain du point de vue de la monnaie domestique.

****le sens de "E" et "S" risquent de changer dans les supports d'amphi****

L'importance c'est de connaître **quelle cotation** (certain/incertain) et de **quel point de vue**.

Dans ce TD:

- Rate **S** is defined as the number of units of the domestic currency needed to purchase 1 unit of a given foreign currency. An increase in this variable is termed nominal depreciation of the domestic currency (counterintuitive). "Domestic price of 1 foreign currency unit". This quotation, in which the home currency is the "price" currency, is the most used and is known as "direct quotation" (cotation à l'incertain). "Foreign price of 1 domestic currency unit".
- Rate **E** is defined as the the number of units of the foreign currency needed to purchase 1 unit of the domestic currency. A increase in this variable is termed nominal appreciation of the domestic currency (intuitive).
- The amount of units of foreign currency purchasable with 1 unit of domestic currency ("indirect quotation") is sometimes denoted $S (=E^{-1})$.

The real exchange rate: $R = EP/P^*$...avec E (et par conséquent, R)) coté au certain, point de vue domestique. Simplement, nominal, multiplié par un rapport de prix.

The real exchange rate R is defined as the ratio of the price level abroad and the domestic price level, where the foreign price level is converted into domestic currency units via the current nominal exchange rate. Formally, $R = (E.P)/P^*$, where the foreign price level is denoted as P^* and the domestic price level as P .

"Price level" can be defined as basket of goods, or representative good, like a Big Mac.

Intuition:

- If the price of a Big Mac goes down in the states, but the FX rate stays unchanged, your euros can buy more Big Macs abroad, and thus the RER has appreciated.

- If the prices of Big Macs in both countries remain unchanged, but the euro depreciates, you can unfortunately buy fewer Big Macs abroad, and thus the RER has depreciated.

“Domestic price of foreign currency” = E = Up is depreciation, down is appreciation.

Graph corresponds to “ E ” definition, but analyzes quantity of foreign currency.

Could do other graph, but what you’d have on vertical axis isn’t E .

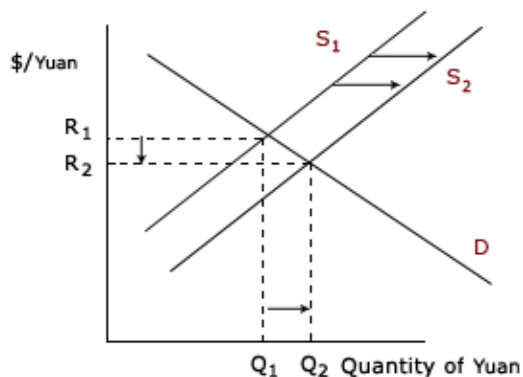
Exercise #2: inflation not sufficient to calculate an exchange rate, but enough to predict changes in the exchange rate, all else equal.

PPP: Inflation in one foreign country → lowers foreign demand (price effect) → lowers demand for the currency needed for this transaction

Ex: Big mac cost \$1.50 yesterday, but \$1.60 today. This disappoints Jean-François the French guy, whose euros can purchase fewer big macs. He therefore demands fewer dollars (and supplies fewer of his euros to do so). At the same time, Rick the American is tired of rising Big Mac prices in the US, so he decides to buy more in Europe. He therefore supplies his dollars to demand more euros. In a sense there are four “separate”, “absolute” effects that all result in an appreciation of the euro relative to the dollar, but really just two relative effects: higher demand for euros **relative to dollars**, and lower supply of euros **relative to dollars**.

Mechanism for PPP:

- 1) S/D graph showing demand shock for big macs in the united states
 - a) Could have a similar graph for europe
- 2) S/D graph for (e) of Big mac
 - a) US big macs more expensive for europeans
 - b) EU big macs cheaper for americans
 - c) These two effects reinforce each other: depreciation of dollar, appreciation of euro.



La théorie prédisant que E doit égaliser le rapport des prix étrangers et domestiques s'appelle la loi du prix unique

Real life:

- spot rate (nominal rate right now)
- forward rate (defined in function of how far in advance, takes into account interest rate differential). Supposed to answer the question: if I save a EUR today at the EUR int rate, and then I save a EUR's worth of dollars at the American int rate (and then after X amount of time convert it back to EUR) all else equal, what will be the ratio of the returns?

Different so-called "parities"

LOP: Law of one price

PPP: Purchasing power parity

The law of one price applies to individual commodities whereas PPP applies to the general price level.

Depreciation = floating exchange rate

Devaluation = fixed exchange rate

CIP: Covered interest rate parity

$$(1 + i_d) = (S / F) * (1 + i_f).$$

No-arbitrage relation. Answers the question: what would the market forward rate be such that nobody can make easy money borrowing in one currency and saving in the other? I.e., for a given exchange rate today, what *future rate agreed upon today* eliminates FX arbitrage profits?

UIP: Uncovered interest rate parity

$$\Delta \text{Expected}(E) = (i_d - i_f)$$

Speaks to future anticipated depreciations. “Uncovered” because there is no forward contract to “cover” future FX risk. I.e., we expect such a movement, but the FX risk remains. We expect depreciation in the country with the higher interest rate, again to eliminate free profits.

PPP is not empirically confirmed: “While the Big Mac and tall latte indices are an immediately engaging and fun way to think about exchange rates, it is easy to come up with good reasons why the prices of coffee and burgers might differ internationally, most of which are related to the fact that many of the inputs into a tall latte or a Big Mac cannot be traded internationally or not easily at least: each good contains a high service component—the wages of the person serving the food and drink—and a high property rental component—the cost of providing you with somewhere to sit and sip your coffee or munch your two beef patties on a sesame seed bun with secret-recipe sauce. Neither the service-sector labor nor the property (nor the trademark sauce) is easily arbitrated internationally, and advocates of PPP have generally based their view largely on arguments relating to international goods arbitrage.”

(US = \$5.28) (for given base currency)

Switzerland - \$6.76 (overvalued by 28.1%)

Euro - \$4.84 (undervalued by 8.4%)

Ukraine - \$1.64 (undervalued by 69%)

$r_{\text{euro},t,t+h} - r_{\text{dollar},t,t+h}$ = depreciation anticipée de l'euro entre t et $t+h$

ATTN: we are not asking the question “what happens if the rates **move**”

We are asking “what happens if we observe a difference in level in market rates”

We assume rates are in equilibrium and that the arbitrage-canceling effects and incentives have already played out, and we deduce a residual that is due to expectations.

Pas le même type de problématique avec l'histoire des big macs.

$R_{\text{eur}} (<>?) r_{\text{usd}}?$
