Topics for Today

1.) The "Real" Exchange Rate

2.) The Balassa-Samuelson Theory of Real Ex. Rate Determination

3.) A General Model of Long-Run Real Exchange Rates

4.) Real Interest Parity

The Real Exchange Rate

$$q = \frac{E P^*}{P} = \frac{\frac{\text{dom. curr.}}{\text{for. curr.}} \times \frac{\text{for. curr.}}{\text{for. goods}}}{\frac{\text{dom. curr}}{\text{dom. goods}}}$$

$$= \frac{\text{domestic goods}}{\text{foreign goods}}$$

$$= \text{price of foreign goods in terms of domestic goods}$$

q is called the real exchange rate.

$q \uparrow \Rightarrow$ real depreciation

$q \downarrow \Rightarrow$ real appreciation

Note, absolute PPP implies q is constant and $q = 1$.

Relative PPP implies q is constant but always $q \neq 1$.

Now the question becomes,
what determines q?

One leading theory links q to the relative price of non-traded goods.

$$p = \alpha(\text{price of non-traded goods}) + \beta(\text{price of traded goods})$$

prices of traded goods equal across countries (Law of one Price).

However, prices of non-traded goods may differ.

Countries where the price of non-traded goods is high, will have strong, apparently over valued currencies. Their real exchange rates will be low.

Balassa - Samuelson

The relative price of NT goods will be higher in countries experiencing relatively rapid productivity growth in the tradeable goods sector.

Rapid prod. growth in tradeables

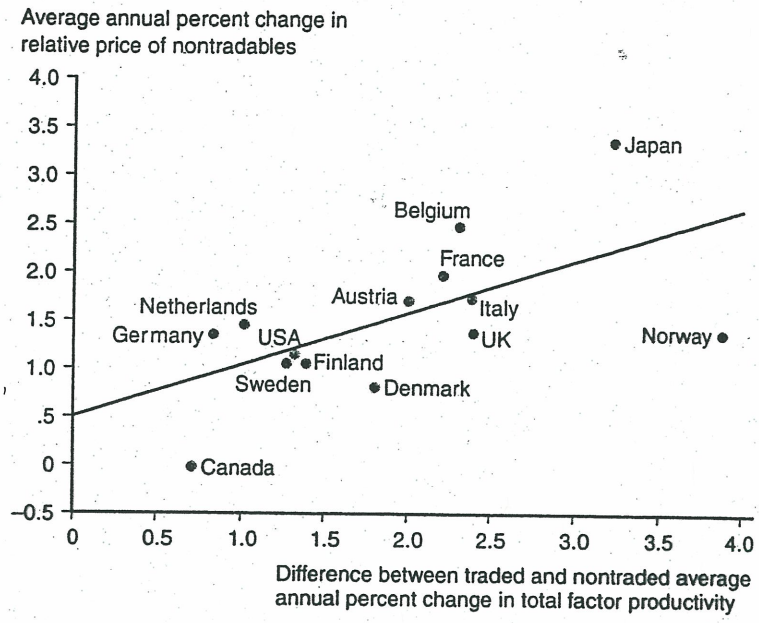
$\Rightarrow$ wages rise in tradeables sector
(prices fixed in world mkts.)

$\Rightarrow$ wages must rise in non-tradeables sector
(labor mobility)

$\Rightarrow$ prices of NT must rise
(competition + zero profits)

Figure 15-6 Sectoral Productivity Growth Differences and the Change in the Relative Price of Nontraded Goods, 1970–1985

A higher traded–nontraded productivity growth difference is associated with a higher rate of increase in the relative price of nontradables.



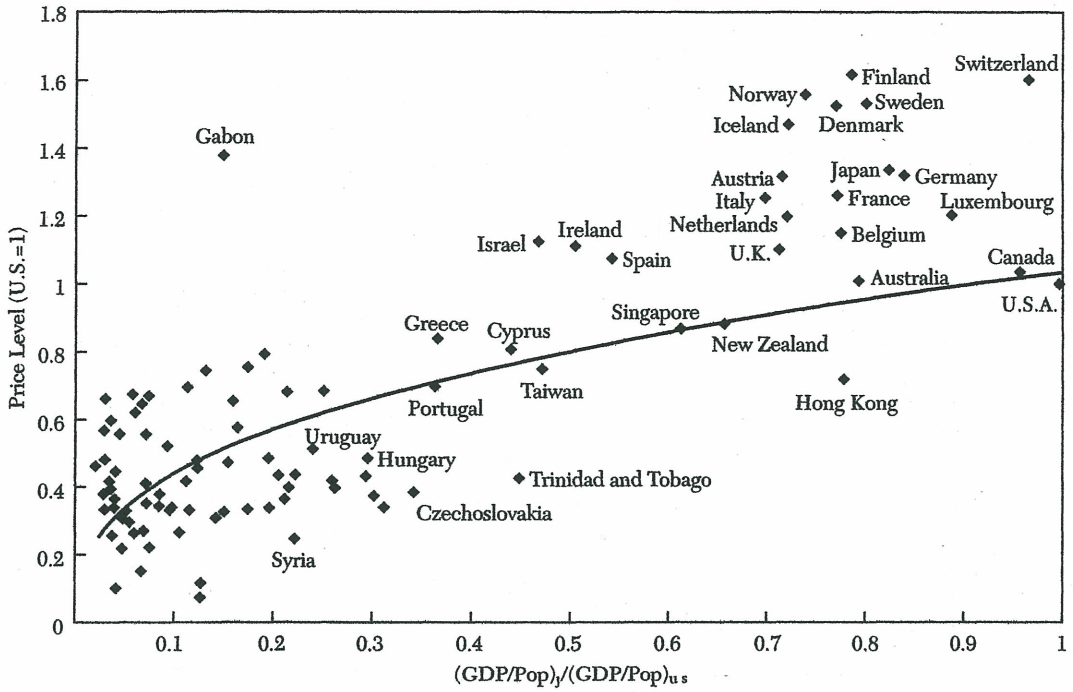


Figure 3. Price Level versus GDP per capita (U.S. = 1) 1990 $\log(P_j/P_{u.s.}) = \underset{(0.090)}{0.035} + \underset{(0.042)}{0.366} \log(Y_j/Y_{u.s.})$

Source: The Penn World Table, Aug. 1994

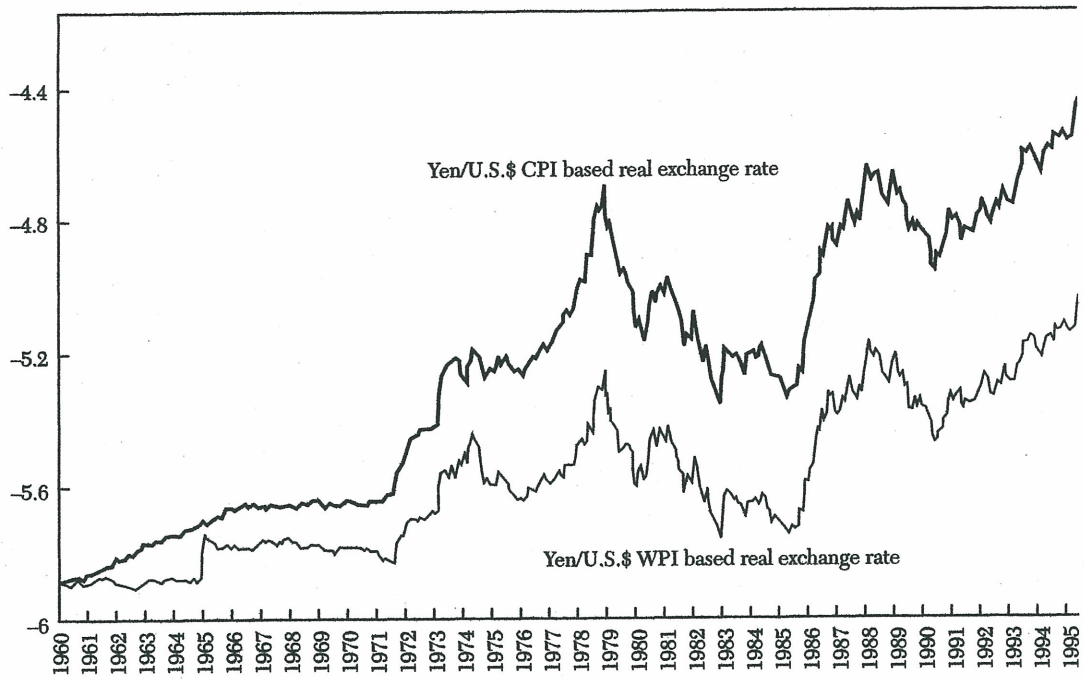


Figure 4. Yen/U.S.$ CPI and WPI based real exchange rates: Jan. 1960–Apr. 1995

Source: International Financial Statistics

Figure 1
Japan

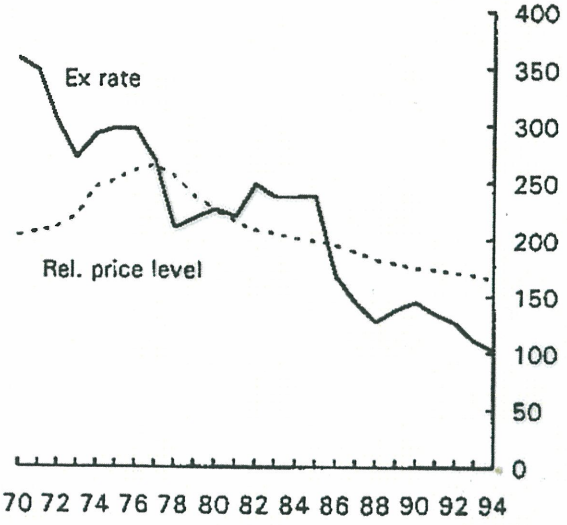
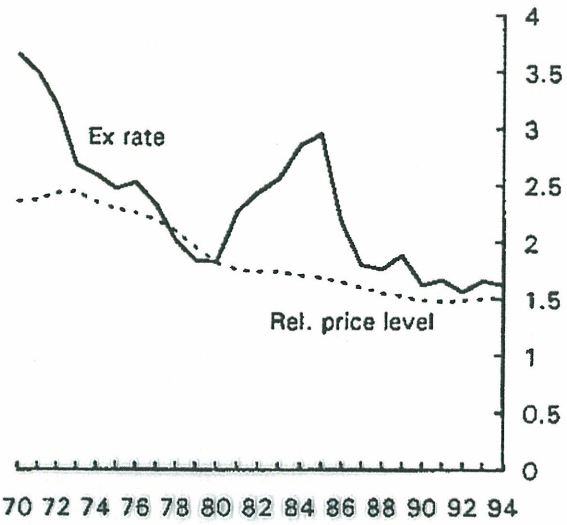


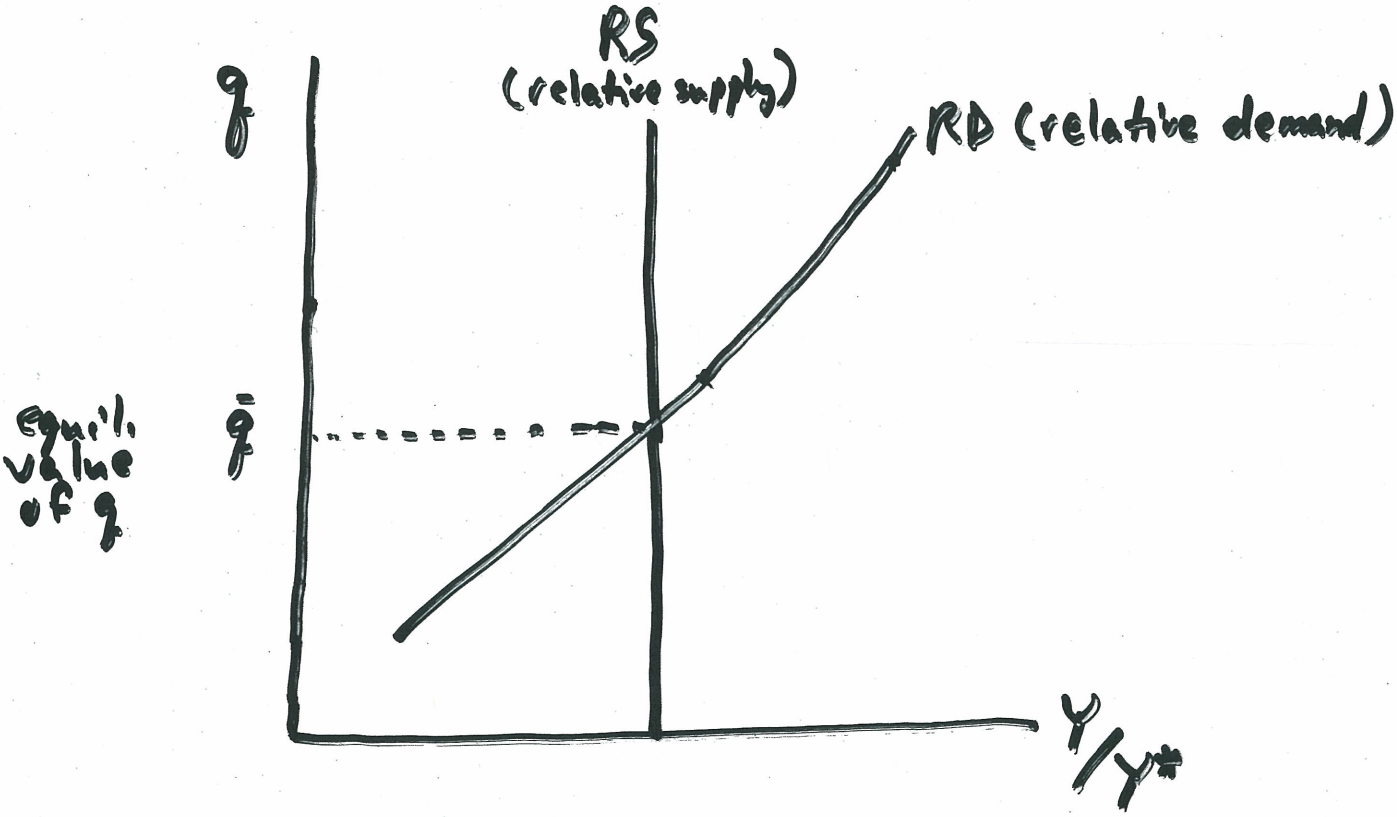
Figure 2
Germany



	Japan	Germany
Avg. Nominal depr.	4.9%	3.2%
$\pi - \pi^*$	0.9%	1.9%
Rel. prod. growth	2.1%	1.1%
	60% accounted for	90+% accounted for

A General Model of Long-Run Real Ex. Rates

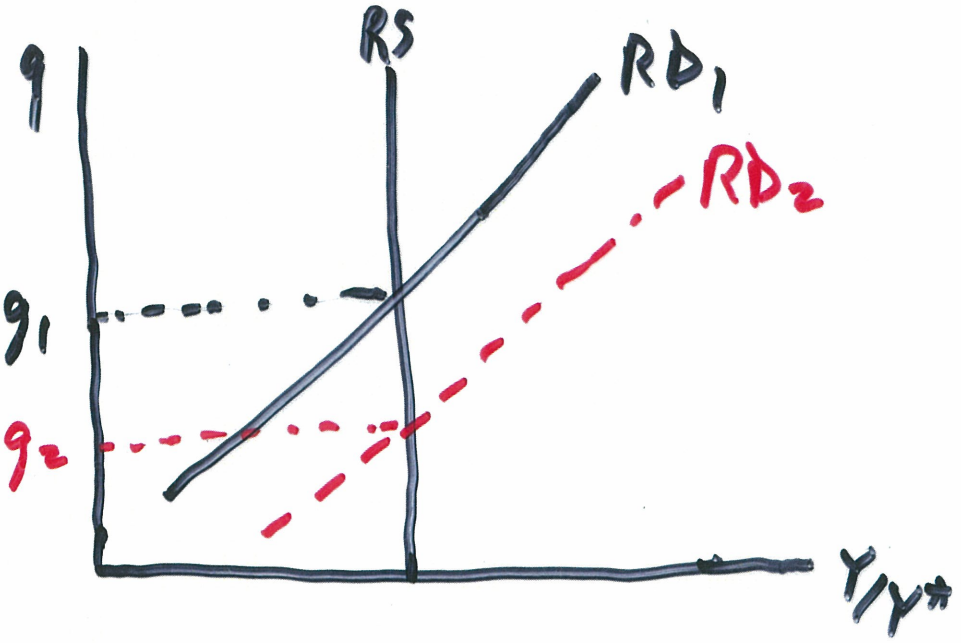
Remember, q is the relative price of foreign goods. Like all prices, it is determined by the interaction of supply + demand, in this case, by the supply + demand of overall national outputs.



a.) $q\uparrow \Rightarrow$ Domestic goods become relatively cheaper
$\Rightarrow RD\uparrow$ (movement along the curve)

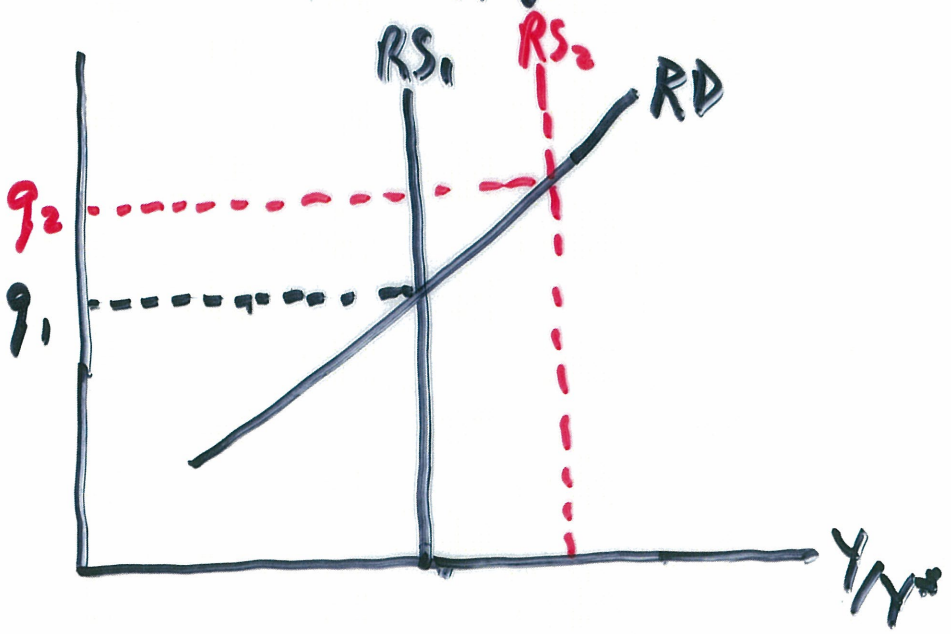
b.) To a first approximation, RS does not depend on q. It is determined by relative factor supplies + relative productivities. Of course, causation could run the other way, i.e., RS can influence q!

Case 1: Increased Demand for Domestic Output



Result: Real Ex. Rate Appreciates

Case 2: Increased Supply of Domestic Output



Result: Real Ex. Rate Depreciates

(Why the difference compared to Balassa-Samuelson?)

What are the implications for nominal exchange rate determination?

By definition,

$$q = \frac{E P^*}{P}$$

Therefore,

$$E = q \times \frac{P}{P^*}$$

We need to distinguish between two general kinds of factors:

1.) Monetary : Shifts in relative money supplies and money demands

2.) Real : Shifts in relative output supplies and output demands

- Purely monetary changes do not change q (i.e., PPP holds). Equal movements in E and P/P^*
- Real disturbances generally change q, and in that way can also change E.

Example 1 : Increased demand for Domestic Output

From before, we know $q \downarrow$.
Therefore, since the demand shift has no direct effects on relative price levels, we know $E \downarrow$ as well.

Example 2 : Increased supply of Domestic output

From before, we know $q \uparrow$.
All else equal, this would cause $E \uparrow$ also.
However, in this case, when $Y \uparrow$ domestic money demand $\uparrow$, and with no change in M^s, this causes $P \downarrow$.
Overall then, the effect on E is ambiguous.

Real Interest Parity

① $q = \frac{E P^*}{P}$

$$\Rightarrow \frac{q^e - q}{q} = \frac{E^e - E}{E} - (\pi^e - \pi^{*e})$$

② UIP $\Rightarrow \frac{E^e - E}{E} = R - R^*$

③ Fisher $\Rightarrow R - R^* = (\pi^e - \pi^{*e}) + (r^e - r^{*e})$

Put them all together,

$$\frac{q^e - q}{q} = r^e - r^{*e}$$

or,

$$\boxed{r^e = r^{*e} + \frac{q^e - q}{q}}$$

> Real Interest Parity