SECTION 7
February 27, 2003

- ## Exchange rate overshooting

Overshooting is short-run excessive movement in exchange rates. It happens because of "difference of speed of adjustment across markets." To be specific, price is sticky in goods market. But price adjusts instantaneously in financial markets (money markets and foreign exchange markets, in this context). In fact, agents know that in the long run, price will increase and exchange rate will depreciate. That is the reason why the curve in foreign exchange market diagram shifts upward. The long-run equilibrium is L. Under flexible price, the economy jumps from I to L instantaneously. But with sticky price, it moves from I to S' instantaneously, and then from S' to L slowly, while P and i increases slowly too. Note that S is not any equilibrium, because of the change in expectation. The difference between levels of E at S' and at L measures the degree of overshooting.

S', L: Sticky price equilibrium
L: Flexible price equilibrium
I :   Initial equilibrium
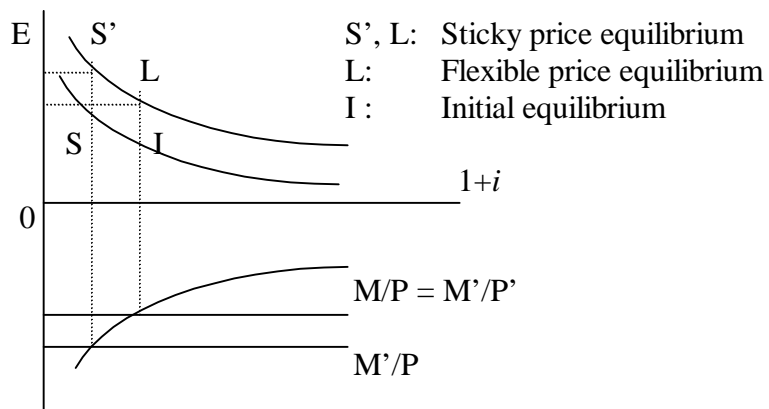
        The diagrams below compare time paths resulting from an unanticipated permanent increase in domestic money supply. The date of long run under flexible price and sticky price are different. Time 0 is both short and long run for flexible price world. In contrast, with sticky price, time 0 is short run and time 1 becomes long run.
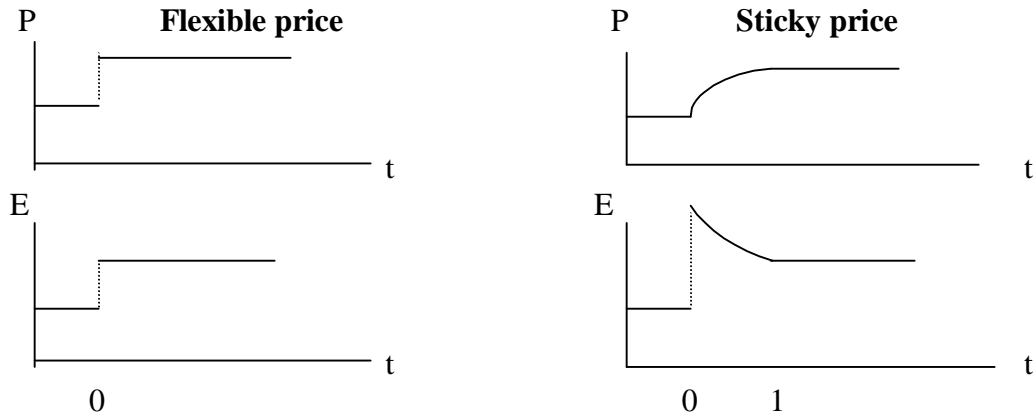
- **Monetary model of long-run exchange rate determination**
  Key Assumptions
  (i)   2 money markets: $m\text{-}p = \eta y\text{-}\lambda i$
  $$m^*\text{-}p^* = \eta y^*\text{-}\lambda i^*$$
  (ii)   Free trade
  → Absolute PPP: $P = E\, P^*$
  → Relative PPP: $\pi = e + \pi^*$
  (iii)   Free capital mobility
  → UIP: $i - i^* = e$

Long-run exchange rate:
$$ln\ E = (m\text{-}m^*) - \eta(y\text{-}y^*) + \lambda(\Delta m\text{-}\Delta m^*)$$

Exchange rate depends on "relative" change in money supply, in output, and in money supply growth rate.

- **Why do structural (economic) models fail to explain movements in exchange rates?**
  The reason is the unrealistic assumptions, particularly assumption (i) and (iii). In fact, other financial asset markets do affect exchange rate determination. The "risk" and "liquidity" features across assets are NOT identical. What exactly is "expected depreciation rate" in aggregate level in UIP?

- **Random walk model**
  Random walk model (or process) is a "time series" model. A time series model is what explains determination of a variable using its own pasts.

Random walk:
$$E_t(E_{t+1}) = E_t + \varepsilon_{t+1}$$
$$\varepsilon_t \sim N(0,\sigma)$$

According to random walk model, the best predictor of future exchange rate is today exchange rate. So far, economists have not come up with a better theory to beat random walk model.