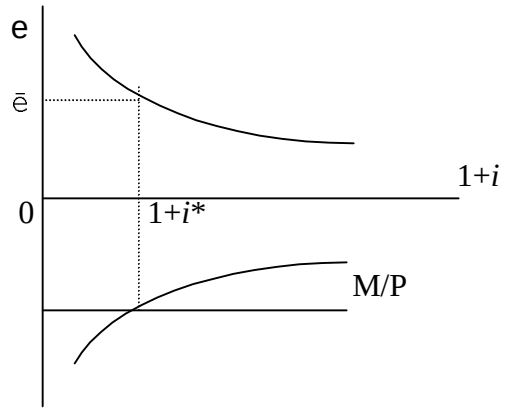
SECTION 8
March 6, 2003

- **Fixed exchange rate regime**
  Tool – Monetary model



Comparison: Fixed vs. Flexible exchange rate regime

	Fixed exchange rate	Flexible exchange rate
(1) Central bank's goal	Set ē.	Set M, or *i*.
(2) Consequents	M and *i* get fixed, too. No monetary independence.	e gets determined. Independent monetary policy

Monetary model

(i)	Money market:	$m-p = \eta y-\lambda i$
(ii)	Relative PPP:	$\pi = \Delta \ln e + \pi^*$
(iii)	Free capital mobility, UIP:	$i - i^* = \Delta \ln e$

Central Bank's balance sheet

Assets	Liabilities
1. Domestic bond, B_t^H	3. Deposits from commercial banks
2. Foreign reserves, B_t^F	4. Money in circulation and the like

3 + 4 ≡ Money supply. As an accounting identity,

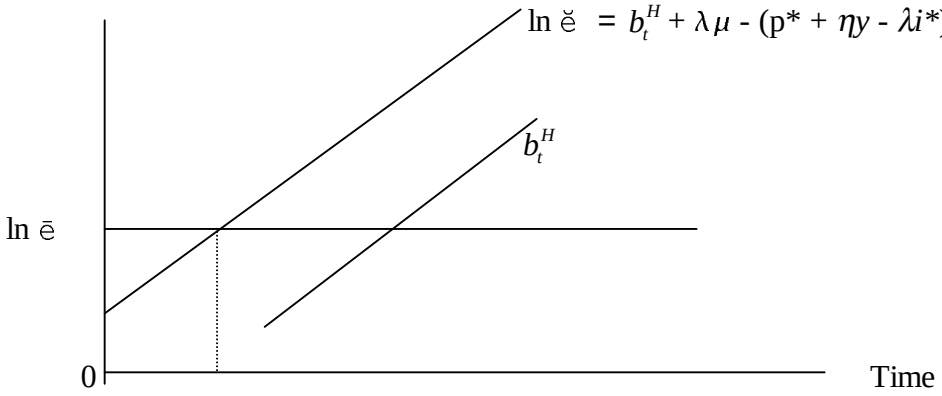
Money supply = Domestic bond + Foreign reserves

- **Currency crisis**

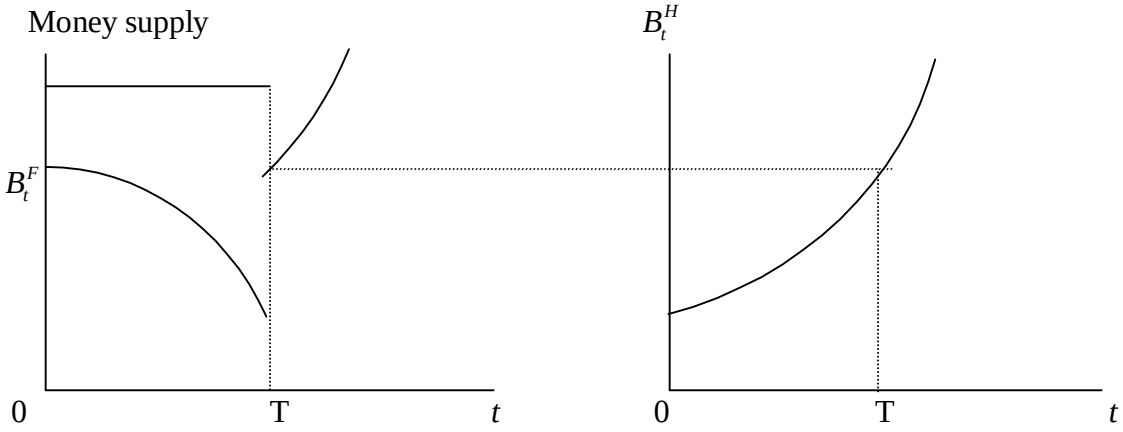
  A currency crisis is a result of a central bank's attempt to implement 2 inconsistent policies.

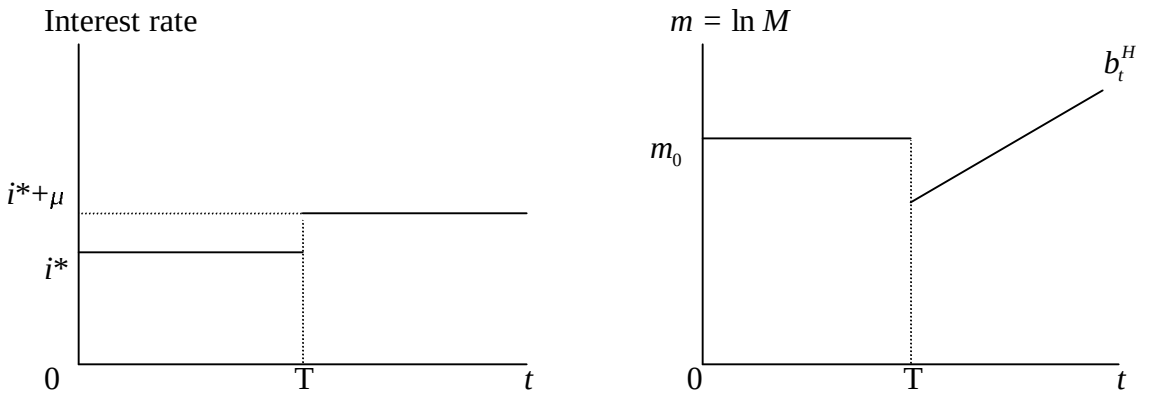
  (1) Fixed exchange rate, at $\bar{e}$.

  (2) Expansion of domestic credit, at the rate μ.



T: Time of the currency crisis





- **An example (Question 2 in HW 4 last year)**

Consider a country with a fixed exchange rate and substantial budget deficits. The exchange rate is fixed at 1,100 local currency units per dollar. Initially (at time = 0), half of its money supply is backed by domestic credit and half by foreign reserves. Due to budget deficits, domestic credit increases at a rate of 10% per month. The semi-elasticity of money demand with respect to the interest rate is 2 and $(p^* + \eta y - \lambda i^*)=10$.

(a) What is the initial nominal money supply?

Combine money market condition ($m-p = \eta y-\lambda i$), and PPP ($p=\ln e + p^*$) with UIP ($i - i^* = \Delta \ln e$). Then,

$$m = \ln e - \lambda \Delta \ln e + p^* + \eta y - \lambda i^*. \quad (1)$$

Substitute the given information into (1).

$m = \ln (1,100) - 0 + 10$

$= 17.0031$

$M = \exp(17) = 24,229,112.$

(b) When will the country be forced to abandon the peg, i.e. when do we see a crisis?

Recall that we see the crisis when $\ln \breve{e} = \ln \bar{e}$. As given,

$$\ln \bar{e} = \ln (1,100). \quad (2)$$

From the currency crisis model, we know the shadow exchange rate equation.

$$\ln \breve{e} = b_t^H + \lambda \mu - (p^* + \eta y - \lambda i^*). \quad (3)$$

(Verify that you can derive (3) from (1) above.) In fact,

$$b_t^H = b_0^H + t \ln(1+\mu). \quad (4)$$

(Do you know how we got (4)?) At t=0, domestic bond is half of money supply. From (a), we can compute b_0^H.

$$b_0^H = \ln (M/2) = \ln (M) - \ln 2 = 17 - 0.69 = 16.31 \quad (5)$$

Substitute (5) into (4).

$$b_t^H = 16.31 + t \ln(1.1) \quad (6)$$

Substitute (6) into (3), and then equates it to (2).

$\ln \breve{e} = 16.31 + t \ln(1.1) + 2(0.1) - 10 = \ln (1,100)$

$t = (7 - 0.2 - 6.31) / \ln(1.1) = 5.14$

The crisis will happen shortly after 5 months.

(c) Depict the money supply and its composition over time.