Models of currency crisis

First generation models

- They explain currency crisis by looking at public deficit dynamics that are not compatible with fixed exchange rate regimes
  - Fiscal deficit is financed with money creation
  - Inflation rises
  - Real exchange rate appreciates
  - A trade deficit appears
  - Official currency reserves decreases
  - Fixed official exchange rate becomes no longer sustainable

Krugman's first generation model

$$m_t - p_t = \hat{y} - ki_t$$

$$m_t = \gamma b_t^d + (1+\gamma) ru_t \quad 0 < \gamma < 1$$

Money supply is a weighted average of domestic credit and official reserves

Setting $p^* = 1$ PPP $s_t = p_t - p_t^*$ may be written as

$$p_t = s_t$$

$$i_t = i_t^* + \dot{s} \quad \text{(uncovered interest parity UIP)}$$

$$\dot{b}^d = \mu \quad \text{(rate of growth of money supply)}$$

Krugman's first generation model

Central Bank finances government budget deficit creating money

Define $\delta = \hat{y} - ki^*$

Then, using the UIP condition

$$\delta = \hat{y} - k\left(i - \dot{s}\right)$$

$$\delta = \hat{y} - ki + k\dot{s} \quad \rightarrow \quad \delta - k\dot{s} = \hat{y} - ki$$

$$m_t - s_t = \delta - k\dot{s} \quad [p = s]$$

With fixed exchange rates $s_t = \overline{s}, \dot{s} = 0$

$$m_t - \overline{s}_t = \delta$$

Krugman's first generation model

Recalling that $m_t = \gamma b_t^d + (1+\gamma) r u_t$

$m_t - \overline{s}_t = \delta$ becomes

$$\gamma b_t^d + (1+\gamma) r u_t = \overline{s} + \delta$$

$$(1+\gamma) r u_t = \overline{s} + \delta - \gamma b_t^d$$

So that $r u_t = \dfrac{\overline{s} + \delta - \gamma b_t^d}{(1+\gamma)}$

Krugman's first generation model

$$ru_t = \frac{\bar{s} + \delta - \gamma b_t^d}{(1+\gamma)}$$

Differencing the above equation we get the time rate of change of official reserves

$$dru_t = -\frac{\gamma}{1-\gamma} db_t^d$$

$$\dot{ru} = \frac{dru}{dt} = -\Theta \frac{db^d}{dt} = -\Theta\mu$$

Official reserves diminishes at a rate proportional to the monetary financing of government deficit

Krugman's first generation model

$\tilde{s}$ Is the "shadow" exchange rate, the market determined exchange rate that would prevail in a flexible exchange rate regime

Comparing the "shadow exchange rate" with the official fixed exchange rate we have three cases:

1) Agents expect $\tilde{s} < \overline{s}$ (expected appreciation) then the exchange rate stay fixed

2) When agent expect a devaluation $\tilde{s} > \overline{s}$ profitable speculation against the currency is possible

3) The speculative attack actually starts at $\tilde{s} = \overline{s}$ when official reserves are depleting because of monetary financing of government deficit

In fact, in monetary models of exchange rates $\dot{m} = \dot{s}$ so that when

$\dot{m} > 0$ Agents expect a depreciation $\dot{s} > 0$