

Issues in International Finance

How pegs break

UW – Madison // Fall 2018

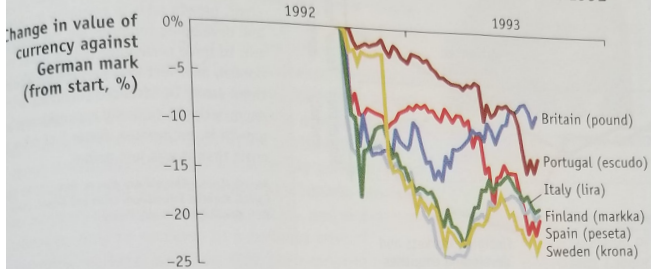
Roadmap

- ▶ Done...
 - ▶ Stabilization policy
 - ▶ Return to the fixed vs. flexible debate
 - ▶ The gold standard, Bretton Woods, ERM
 - ▶ More on fixed fx rates (pegs)
- ▶ Working on...
 - ▶ Exchange rate crises / models

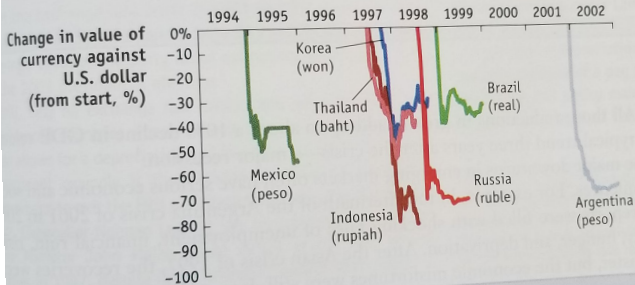
Exchange rate crises

- ▶ An fx crisis is a “big” depreciation (somewhat subjective)
 - ▶ Advanced economies 10–15 percent
 - ▶ Emerging economies 20–25 percent
- ▶ Crises tend to come in waves
 - ▶ Because of fundamentals (common shocks)
 - ▶ Because of contagion

(a) Depreciation in Year after 6 European Exchange Rate Crises in 1992



(b) Depreciation in Year after 7 Emerging Market Crises in 1994–2002



Exchange rate crises

- ▶ An fx crisis is a “big” depreciation (somewhat subjective)
 - ▶ Advanced economies 10–15 percent
 - ▶ Emerging economies 20–25 percent
- ▶ Crises tend to come in waves
 - ▶ Because of fundamentals (common shocks)
 - ▶ Because of contagion
- ▶ Often accompanied by banking crises & default crises
 - ▶ We have seen already how banking & default crises can lead to exchange rate problems

$$i = i^* + \frac{E^e}{E} - 1 + \gamma_{fx} + \gamma_{df}$$

Two kinds of fx crises

1. Inconsistent fiscal policy (1st generation)

- ▶ Fundamental problem: **central bank is not independent**

2. Contingent monetary policy (2nd generation)

- ▶ Fundamental problem: **central bank lacks commitment**

- ▶ Let's study each in turn...

Inconsistent fiscal policy

- ▶ This is the classic emerging market crisis
- ▶ Fiscal authority runs government budget deficit ($T - G$)
- ▶ Deficit is funded by debt, but eventually public will not buy more debt
- ▶ Central bank is **not independent**: Fiscal authority makes CB print money to buy debt: monetization
- ▶ Monetization is an increase in B , which leads to a decrease in R
 - ▶ Reserves fall
 - ▶ Peg breaks

Example: Inconsistent fiscal policy

- ▶ Government deficit requires issuing ΔB debt each year
- ▶ Assume $\Delta B/B = \mu_b$ is constant
- ▶ All else equal, this drains reserves until peg breaks
- ▶ After peg breaks, $\Delta M/M = \mu = \Delta B/B = \mu_b$
 - ▶ Money supply grows at rate of debt growth
 - ▶ Generates inflation, and if μ_b is big, hyperinflation

Inconsistent fiscal policy



Example: Inconsistent fiscal policy

- ▶ Consider *myopic* agents. They do not take the future into account.
- ▶ How does the economy evolve, as it finances its debt with money?
- ▶ Assume
 - ▶ At time 0: $M = 1, P = 1, P^* = 1, R > 0, B > 0$
 - ▶ B grows at μ_b
 - ▶ Y is constant
 - ▶ Prices are flexible

Myopic agents

Myopic agents

- ▶ Once the CB runs out of reserves
- ▶ Inflation expectations change
- ▶ Interest rates and money demand jump
- ▶ Prices and exchange rates jump
- ▶ Anyone holding pesos at T makes a capital loss

Forward-looking agents

- ▶ The potential capital loss means that investors will have an incentive to be forward-looking
- ▶ If they think the peg will break in the future, will get out of pesos before that happens
- ▶ Investors dumping their pesos before the peg breaks makes the situation worse (decreasing reserves)
 - ▶ We call this a speculative attack on the currency

Forward-looking agents

Forward-looking agents

- ▶ Attack forces CB to run out of reserves earlier
 - ▶ Inflation expectations change
 - ▶ Interest rates and money demand jump
 - ▶ Since M is falling, prices and exchange rates do not jump
 - ▶ Anyone holding pesos at T breaks even
-
- ▶ Expectations are key: Attack occurs before CB would run out of reserves

Forward-looking agents: Critical reserve ratio

- ▶ The speculative attack happens when there will be no discontinuous change in P
- ▶ P does not change because M changes exactly to offset it
- ▶ Notice that if μ_b increases, the attack happens sooner
- ▶ If investors believe that μ_b will increase, will run sooner!
 - ▶ A crisis happens due to beliefs about future monetization of the debt

Two kinds of fx crises

1. Inconsistent fiscal policy

- ▶ Fundamental problem: **central bank is not independent**
- ▶ CB monetizes debt, will run out of reserves
- ▶ Run on the currency (attack) happens early
- ▶ Expectations over future debt growth are key

2. Contingent monetary policy

- ▶ Fundamental problem: **central bank lacks commitment**

Contingent monetary policy

- ▶ Monetization of debt is not an issue in many countries that still experience fx crises (e.g., Europe)
- ▶ Crises that occur without monetization are examples of problems that arise from a lack of commitment by the central bank
- ▶ Investors know that in some states of the world (low output) keeping the peg is costly. During these times, they may believe that the peg is **not credible**. This can lead to a crisis.

Contingent monetary policy

- ▶ Let there be a benefit from the fixed fx rate, b
- ▶ Let the cost of the fixed fx rate be the *output gap*: $c = Y - \bar{Y}$
- ▶ Compare costs and benefits when the peg is
 1. Credible: Investors believe peg holds next period
 2. Not credible: Investors believe will float next period

Credible peg

Contingent monetary policy

- ▶ Credible peg
 - ▶ Country bears cost c , which is increasing in size of recession
 - ▶ Nothing changes in fx market

Defending a non-credible peg

Contingent monetary policy

- ▶ Credible peg
 - ▶ Country bears cost c , which is increasing in size of recession
 - ▶ Nothing changes in fx market
- ▶ Non credible peg
 - ▶ For same size shock, c is larger than in credible case
 - ▶ The shift in FR from a change in expected fx rate drive this result
 - ▶ Larger decrease in M needed, reserves drain faster

Costs and benefits

Contingent commitment: Multiple equilibria

- ▶ For small recessions (small c) defend the peg whether credible or not. Investors know this, so they believe credible. **Peg stands**, and c is the credible value.
- ▶ For very large recessions, (very large c), do not defend the peg whether credible or not. Investors know this, so they believe it is not credible. **Peg falls**.
- ▶ For intermediate values of c , the equilibrium depends on **market beliefs**. If investors think peg is credible, then CB will defend the peg, since $c_c < b$. If investors think peg is not credible, then CB will abandon the peg, since $c_{nc} > b$. The crisis is self-fulfilling.

Self fulfilling fx crises

- ▶ The outcome in the intermediate case depends on beliefs
- ▶ During a speculative attack that occurs in this zone, both sides will try to influence beliefs
 - ▶ Investors make public claims about weakness of peg
 - ▶ CB makes public claims about strength of peg
 - ▶ IMF support (statements about reserve loans) may tip the balance
- ▶ Removing peg discretion can help avoid these situations
 - ▶ Currency boards
 - ▶ Common currencies (Euro)