8TH JACQUES POLAK ANNUAL RESEARCH CONFERENCE
NOVEMBER 15-16, 2007

When Is It Optimal to Abandon a Fixed Exchange Rate?

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Presentation give at the 8th Jacques Polak Annual Research Conference
Hosted by the International Monetary Fund
Washington, DC─November 15-16, 2007
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Motivation

- An open economy with a fixed exchange rate suffers an unexpected fiscal shock: an increase in government expenditures that has to be financed with seignorage.
- When should the fixed exchange rate regime be abandoned?

- With some probability, a future fiscal reform or a financial package from the IMF can restore the sustainability of the fixed exchange rate regime.
- For how long should policy makers wait for this scenario to materialize?

Krugman-Flood-Garber model

Two key elements

- The root cause of the eventual abandonment of the fixed exchange rate is unsustainable fiscal policy.
- The central bank follows an ad-hoc exit rule: the fixed exchange rate regime is abandoned only when the central bank exhausts its foreign exchange reserves and its ability to borrow.

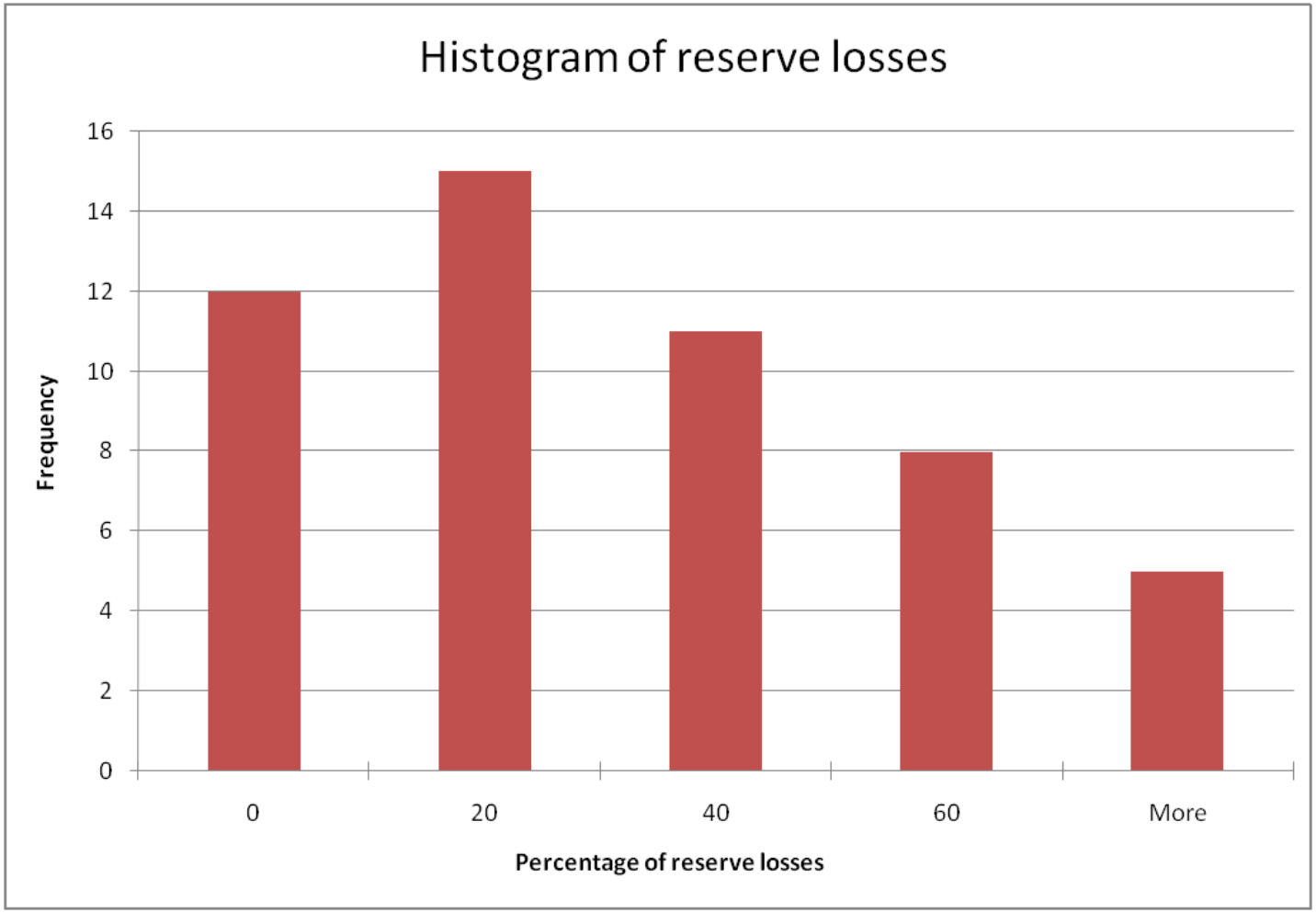
Are fiscal currency crises caused by fiscal shocks?

- 51 episodes in which fixed exchange rate regimes were abandoned.
  - Episodes selected from an updated version of Kaminsky and Reinhart's (1999).
- There were increases in real government spending in the three years prior to the abandonment of the peg in 80 percent of the episodes.
- Fiscal shocks are plausible suspects as the root cause of the decision to abandon a fixed exchange rate.

Do countries exhaust their reserves before a devaluation?

- The KFG model is not explicit about the critical lower bound for international reserves (is it zero? is it negative?). But it is in the spirit of the model that the monetary authority holds on to the peg for as long as it can.
- However, we do not see central banks exhaust international reserves before abandoning a peg. Many pegs are abandoned with plenty of reserves left in the central bank's coffers.
- The evidence suggests that the monetary authority *chooses* to devalue as opposed to *being forced* to devalue by literally exhausting its reserves and its ability to borrow.

Fraction of initial reserves lost during the 12 months prior to the crisis



When is it optimal to abandon fixed exchange rate?

- If countries *choose* to devalue as opposed to *being forced* to devalue what determines the optimal time to exit the fixed exchange rate?

- This paper takes a first step in answering this question in the context of an optimizing model that is close in spirit to the Krugman-Flood-Garber model.

Basic model

- Optimizing, small-open-economy model in which money is introduced via a cash-in-advance constraint.
- All agents, including the government, can borrow and lend in international capital markets at a constant real interest rate r.
- There is a single consumption good and the law of one price holds:

$$P_t = S_t.$$

- Foreign price level normalized to one.
- P_t = domestic price level.
- S_t, exchange rate, defined as units of domestic currency per unit of foreign currency.

Fiscal shock

- At time $t = 0^-$, the economy is in a sustainable fixed exchange rate regime with exchange rate S.
- At $t = 0$ the economy suffers a 'fiscal shock': an increase in government spending.
- The present value of the spending increase is $\Delta\Gamma$.
- The fiscal shock must be financed with seignorage revenues.
- Generating these revenues requires abandoning the fixed exchange rate regime at some point in time.

Households

- Lifetime utility

$$V \equiv \int_0^\infty \log(c_t) e^{-\rho t} dt.$$

Intertemporal budget constraint:

$$b_{0^-} + y/r = \int_0^\infty (c_t + \dot{m}_t + \varepsilon_t m_t) e^{-rt} dt + \sum_{j \in J} e^{-rj} (M_j - M_{j^-}) / S_j.$$

Cash-in-advance constraint:

$$m_t \geq c_t.$$

- y = output
- c_t = consumption
- m_t = real balances
- b_t = net foreign assets
- ε_t = rate of devaluation

Government

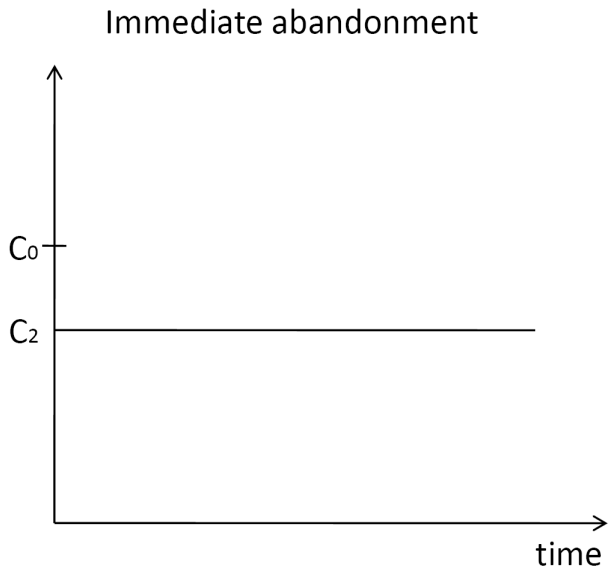
- Intertemporal budget constraint:

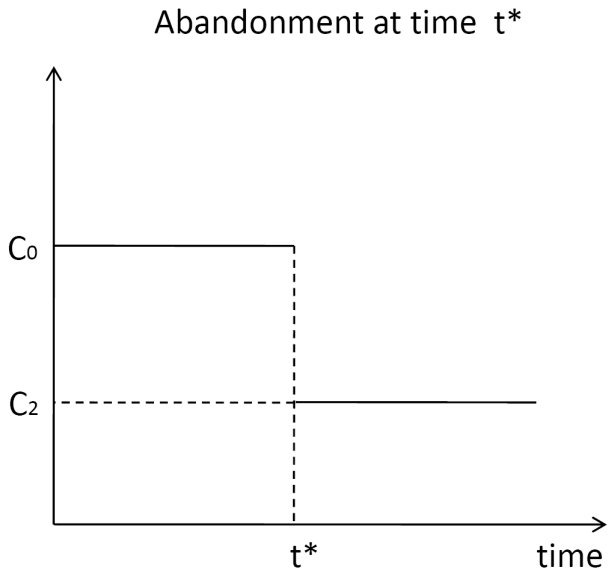
$$f_{0^-} + \int_0^\infty (\dot{m}_t + \varepsilon_t m_t) e^{-rt} dt + \sum_{j \in J} e^{-rj} (M_j - M_{j^-}) / S_j = \int_0^\infty g_t e^{-rt} dt,$$

- g_t = government spending
- f_t = government's net foreign assets.

Optimal monetary policy

- In the absence of exit costs it is optimal to abandon the fixed exchange rate regime at time zero, as soon as the fiscal shock occurs.
- Delaying the exit generates no benefits and distorts the path for consumption.





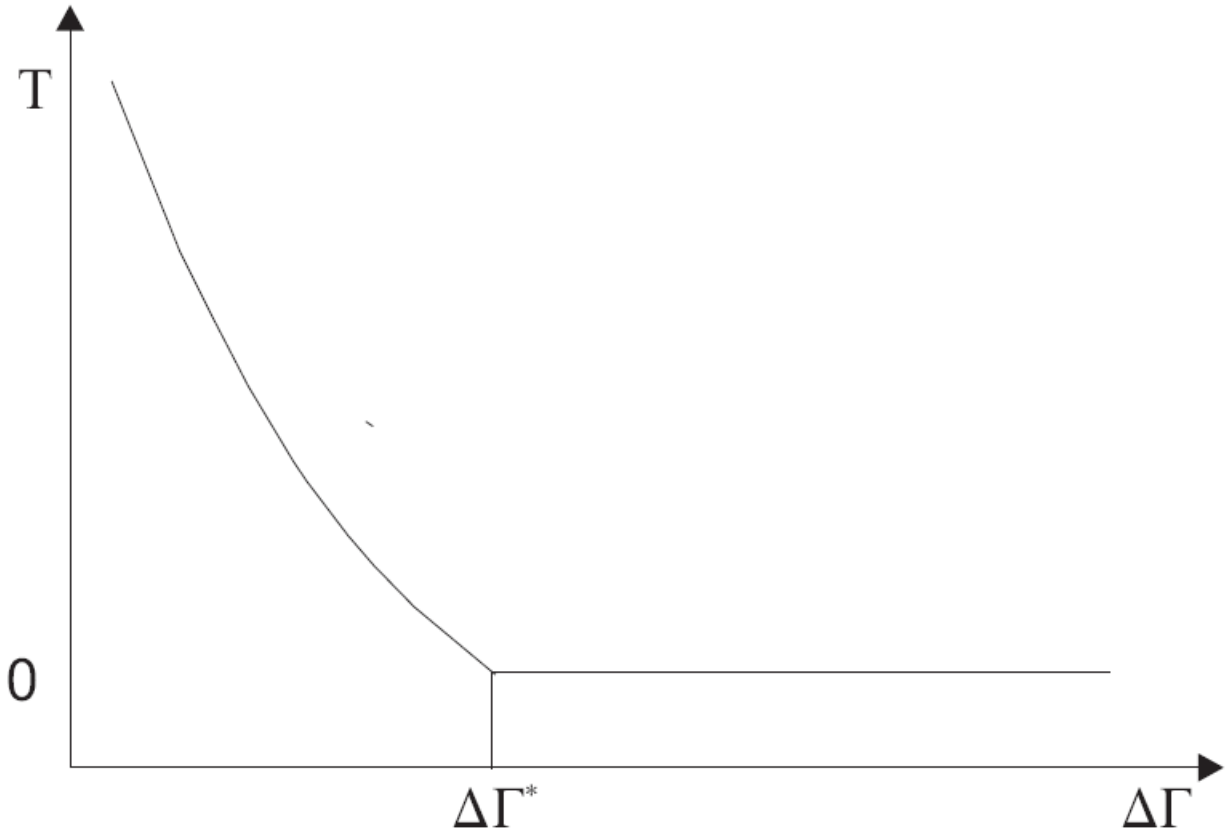
Optimal monetary policy with exit costs

- When the fixed exchange rate is abandoned, the government incurs a fiscal cost of ϕ, which is also a social cost.
  - This exit cost can reflect a fall in output and tax revenues or the costs of bailing out domestic banks and foreign creditors.

- Delaying is optimal only when the fiscal shock is low and ϕ takes on an intermediate value. In all other cases, it is optimal to abandon immediately.

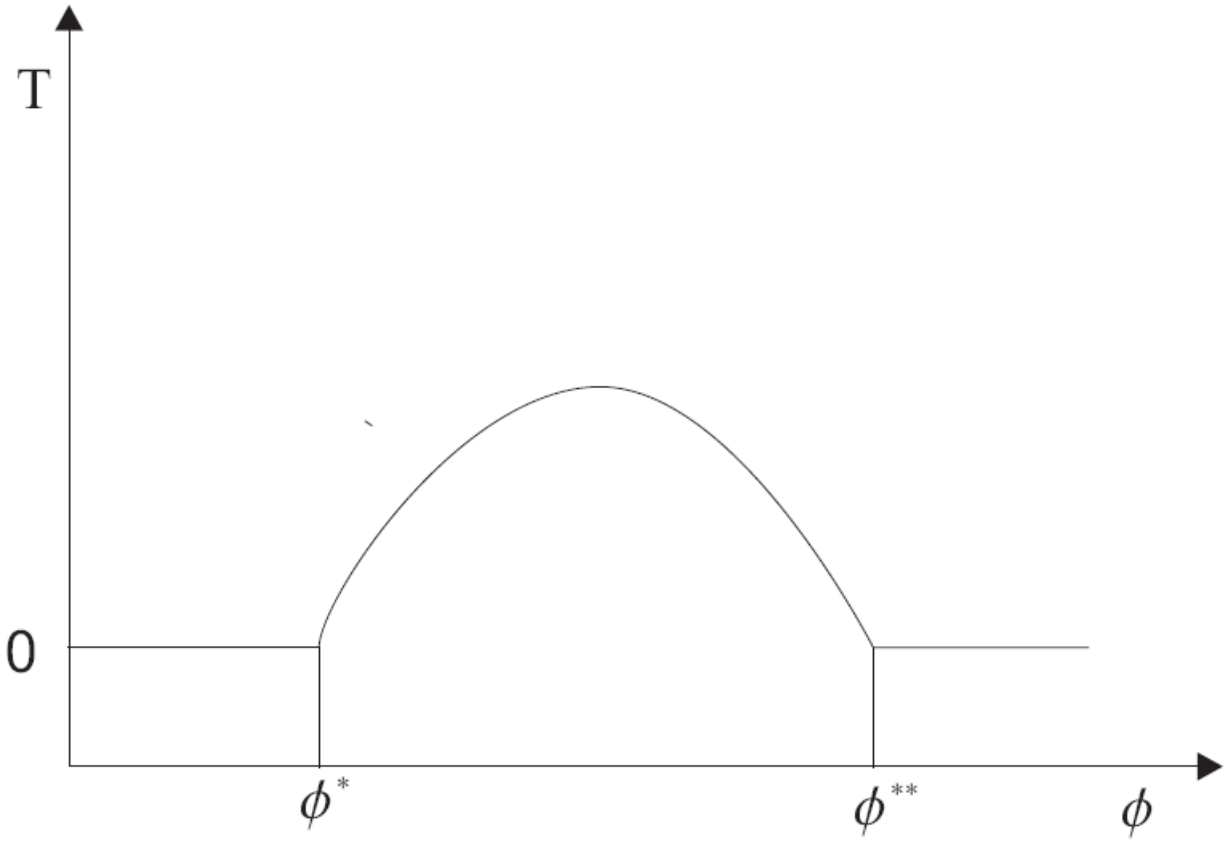
Optimal exit time as a function of the fiscal shock

Benefit of delaying $= r\phi$.



Optimal exit time as a function of exit cost

Benefit of delaying $= r\phi$.



Robustness

- These results are robust to various extensions
  - Time-varying exit costs;
  - The exit cost is not a fiscal cost;
  - Non-unitary elasticity of intertemporal substitution;
  - The exit cost increases with the fiscal shock.

Stochastic model

- There are no exit costs.
- Before time zero the fixed exchange rate regime was sustainable.
- At time zero the economy learns that the present value of government spending has increased by $\Delta\Gamma$.
- While the exchange rate is fixed there can be a reduction in government spending that makes the peg, once again, sustainable. This expenditure reduction occurs according to a Poisson process with arrival rate λ.
  - A fixed exchange rate regime exerts pressure on the fiscal authorities to enact reforms to make the peg sustainable. This pressure disappears once the exchange rate floats.
  - The country can receive a bailout transfer from abroad which makes the peg sustainable and arrives according to a Poisson process.
- If the peg is abandoned, the increase in government spending becomes permanent and has to be financed with seignorage revenues.

Optimal monetary policy

- For every finite positive value of λ, there is a threshold value for the present value of government spending, Γ^*.
- For $\Gamma_0 > \Gamma^*$ it is optimal to abandon the peg at time zero.
- For $\Gamma_0 \leq \Gamma^*$ it is optimal to delay abandoning the peg.
- The value of Γ^* is increasing in λ.

Conclusion

- From a positive standpoint the KFG rule is at odds with many episodes in which the central bank has plenty of international reserves at the time of abandonment.
- From a normative standpoint, our analysis suggests that the KFG rule is in general suboptimal.
- Optimal exit strategy:
  - When there are no exit costs, it is optimal to abandon immediately.
  - When there are exit costs, the optimal abandonment time is a decreasing function of the size of the fiscal shock.
  - Immediate abandonment is optimal for large fiscal shocks.