Cheap but Flighty: How Global Imbalances Create Financial Fragility[1]

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[1]The views expressed in this paper are those of the authors and no responsibility should be attributed to the Bank of Canada.

Global imbalances

- Common view: US credit boom caused by global imbalances
  - Large foreign inflows compensated low US savings
  - This kept interest rates low and boosted credit volume
  - Evidence: volume of credit associated with crises
- **Does composition of funding contribute to crises?**

Capital flows between EM and advanced economies

- Historically, capital moved from developed to emerging countries
  - less than implied by neoclassical theory (Lucas, 1990)
  - explained by political risk, weak property rights
- Reversal of net flows since 1998 (Prasad et al., 2007)
  - US capital inflows: $7.8 trillion over 2002–07 (Forbes, 2010)
  - 81% held by private sector (often anonymously)

This paper

- Capital flows from emerging to developed countries
- Focus on safety-seeking flows
  - Exposed to expropriation risk
  - Seek property right protection
- Safety-seeking inflows **contribute to domestic fragility**
  - Cheap source of funding, more investment
  - Flighty: risk-avoiding savers create instability
  - Trade-off emerges under optimal contracting, without bailouts or deposit insurance

Model

- Three dates ($t = 0, 1, 2$) and two regions
- Domestic and foreign savers of mass 1 and W
- Identical endowment $e > 1$, identical preferences
- Demand for some absolute safety
  - minimum consumption level $S \in (0, 1)$
  - risk-neutral once subsistence is secured

$$U(c_1, c_2) = \begin{cases} c_1 + c_2 & \text{if } c_1 + c_2 \geq S \\ -\infty & \text{if } c_1 + c_2 < S \end{cases}$$

- Consistent with evidence on strong demand for safe assets

Assets

- Intermediaries can lend to real investment
  - unit mass of domestic intermediaries $i \in [0, 1]$
  - funded by claims issued to savers
- Savers can invest directly in local assets, and via intermediaries in assets abroad
  - Physical storage, offers return of $x \in [\frac{S}{e}, 1)$
  - Government bonds, yielding 1 at $t = 1$, $T > 1$ at $t = 2$

Expropriation risk

- Domestic government never expropriates
- Foreign government may expropriate assets in own region (except storage)
  - Expropriation risk is heterogeneous
    - $\theta_L > 0$ for locals
    - $\theta_H > \theta_L$ to domestic agents
- Expected return in foreign region is R_F

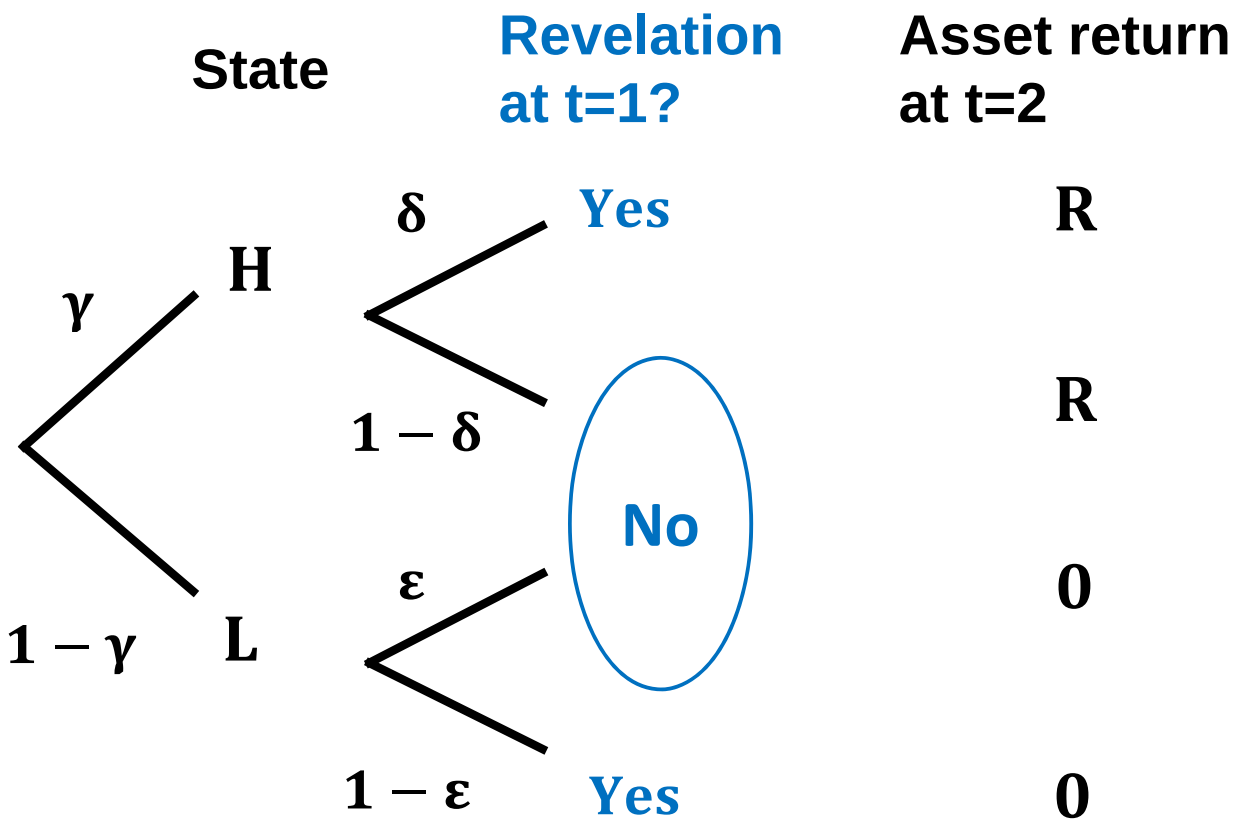
$$(1 - \theta_H)R_F < T < (1 - \theta_L)R_F$$

- This discourages speculative capital flows
- We focus on safety-seeking flows from abroad

Intermediaries and real investment

- Common lending technology with return at $t = 2$:
  - R with probability $\gamma \in (0, 1)$ or zero
- Decreasing returns to scale from investment $I_i \geq 0$
- Early liquidation at $t = 1$ yields a fraction $\alpha \in (0, 1)$
  - Liquidation efficient in the low state
  - Liquidation inefficient in the high state: $R\left(\frac{x}{x-\alpha}\right) > \alpha$
- At $t = 1$, uncertainty is resolved with some probability
- Assume: under uncertainty, best not to liquidate

Information structure



How to achieve absolute safety?

- Domestic savers
  - storage (no: dominated)
  - domestic bonds (yes)
  - safe claim on a domestic intermediary
    (in equilibrium, choose a risky claim)
- Foreign savers
  - storage (outside option)
  - safe claim on a domestic intermediary (equilibrium choice)

Intermediaries and funding

- Intermediaries max equity value under limited liability
- Each has access to domestic funding equal to $d_i \in [0, 1]$
- Compete freely for foreign funding $f_i \geq 0$
  - Signal at $t = 1$ and return at $t = 2$ not verifiable
  - So intermediaries offer a menu of debt contracts
  - Either long-term or demandable, $\{(L_1, L_2), (X_1, X_2)\}$

Equilibrium with foreign inflows

Optimal funding contract

- Assume that no liquidation is optimal under interim uncertainty:

$$\epsilon < \bar{\epsilon} \equiv \frac{\gamma(1-\delta)}{1-\gamma} \frac{R\left(\frac{x}{x-\alpha}\right) - \alpha}{\alpha},$$

Proposition

The intermediaries target

- *long-term debt to domestic savers, with expected yield T;*
- *demandable debt to foreigners, minimizing early withdrawal payoff at $X_1^* = x$.*

Portfolio choice of savers

- Domestic savers obtain safety by investing S/T in the domestic long-term bond, and the remaining unit wealth in risky debt of the intermediary.
- Foreign savers either store S/x or invest in demandable debt provided it is absolutely safe and has a return of at least x. Their remaining wealth is invested in foreign risky assets.

Demandable debt is optimal

- Recall: early liquidation is inefficient under uncertainty
- This leaves minimal risk in long-term funding
- Thus foreign savers refuse long-term debt at $t = 0$

Lemma

Absolute safety and demandable debt. *Foreign savers accept a demandable debt claim if enough (loss-absorbing) domestic funding is attracted,* $d_i \geq \frac{x-\alpha}{\alpha} f_i$.

Financial fragility

Lemma

Foreign savers achieve absolute safety by withdrawing under uncertainty (to avoid minimal risk), and in the low state (to avoid dilution).

- Trade-off between the **cost** and **stability** of funding
  - cheap foreign funding enable to expand investment
  - inefficient liquidation under uncertainty
- Banks attract cheap foreign funding if
  - cheap enough ($W > \underline{W}$)
  - not too flighty ($\delta \geq \underline{\delta}$)

Extensions

Opaque investment

- More bank lending implies lower NPV, but not necessarily more risk
- Yet more lending may require choosing increasingly opaque assets
  - Let $\delta = \delta(I_j)$ with $\frac{d\delta}{dI_j} < 0$.
- Consequences of increasing opacity: **greater frequency of runs**
- As intermediary bears all cost, reduce investment

Social cost of excessive liquidation

- Runs may impose social costs
  - illiquidity externalities (e.g., Stein (2002))
  - social cost of excess liquidation $\xi > 0$
- Constrained planner (P)
  - takes supply of foreign and domestic funding as given
  - chooses domestic and foreign funding $f_P(X)$
  - $f_P < f^*$
- **Socially optimal to reduce volume of credit and the level of foreign funding**

Market solution

- Could private arbitrage resolve ex-post inefficient liquidation?
  - Investors who have achieved safety could arbitrage
  - Hold short-term bond until $t = 1$
  - Buy demandable claims in a run under uncertainty
  - Assume they have all bargaining power
- None will choose to pursue arbitrage if

$$T - 1 > \gamma(1 - \delta)\frac{R}{\alpha}$$

  - Impossible to lever up with cheap foreign funding

Induced runs

- Let domestic savers have some liquidity need
  - additional mass $\omega > 0$ of domestic savers
  - seek demandable debt, accept liquidity discount
- Rollover decision of domestic savers (under uncertainty)

$$\frac{\gamma(1-\delta)}{\gamma(1-\delta)+(1-\gamma)\epsilon} \min\left\{X^*, R(I^* - \frac{x}{\alpha}f^*)\frac{X^*}{\omega X^* + L^*}\right\} \geq x$$

- **More foreign wealth induces even risk-tolerant savers to run!**
  - (to avoid dilution, not to escape risk)

Safe intermediaries?

- Can an intermediary target safe assets?
- Foreigners would accept long-term senior debt if no asset risk
  - Assume no scarcity of safe assets
- Can MMMF commit to invest in safe securities ?
  - intermediaries have incentive to make riskier investment
  - Evidence: Kacperczyk and Schnabl (2013)
- No commitment possible: cannot attract safety-seeking funding

Conclusion

- **Global imbalances may generate financial fragility**
  - driven by safety-seeking inflows
  - intermediated under optimal contracting
  - no bailouts or deposit insurance
- Private incentive to target cheap but flighty foreign funding
  - Boosts domestic lending into marginal project
  - Leads to inefficient runs in solvent states

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- **Thank you!**