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Financial Frictions, Foreign Currency Borrowing, and Systemic Risk

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Background

- Growing literature on relationship between idiosyncratic and systemic risk

- Several channels
  - Things good for a bank/firm, not good for system (Shin)
  - Strategic complementarities (Farhi-Tirole)

- Systemic risk and foreign currency borrowing
  - FX solves agency problem, but generate systemic risk (Rancierre-Tornell-Westermann)

  - Liability "dollarization" and government behavior (Jeanne, Chang and Velasco)

What do we know?

- Liability dollarization associated with faster credit and economic growth
  - Evidence from emerging markets, Eastern Europe
- Link between liability dollarization and banking crises
- Foreign currency borrowing is more prevalent in more rigid exchange rate regimes

Our Model's Contribution

- Limited liability and asymmetric information induce MH:
  - Excessive risk taking
  - Credit rationing
- FX borrowing:
  - May reduce MH by lowering borrowing rate
  - Increases output
  - Exposes economy to systemic risk
- Trade-off: Average performance vs systemic risk
  - Contagion risk complicates the picture
- Room for policies limiting FX exposures/mismatches

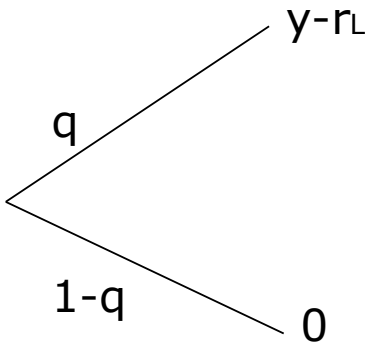
Basics of Model - Firms

- Firms are protected by limited liability and need to borrow to realize a project
- Probability of success depends on the entrepreneur's (unobservable) costly effort

$$\Pi = q(y - r_L) - \frac{c}{2}q^2$$

Basics of Model - Firms

- This generates a classic MH problem: *too little effort*

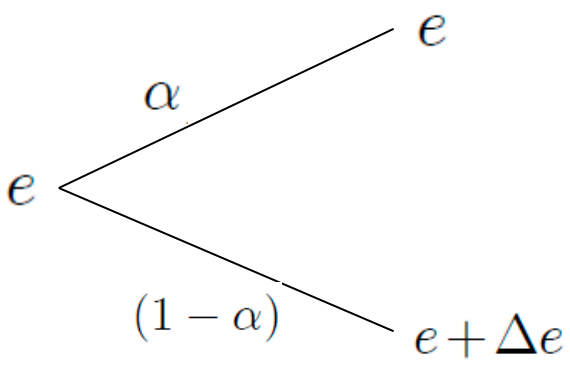


- Problem more severe with higher interest rates
- Lenders will charge a risk-adjusted interest rate:

$$\widehat{r}_L = \frac{r^*}{\widehat{q}}$$

FX borrowing

- Firms can borrow in either domestic or foreign currency
- Risk-free rates linked by a parity condition $r^* = r^{*f} + \widehat{e}$
- A "peso Problem"

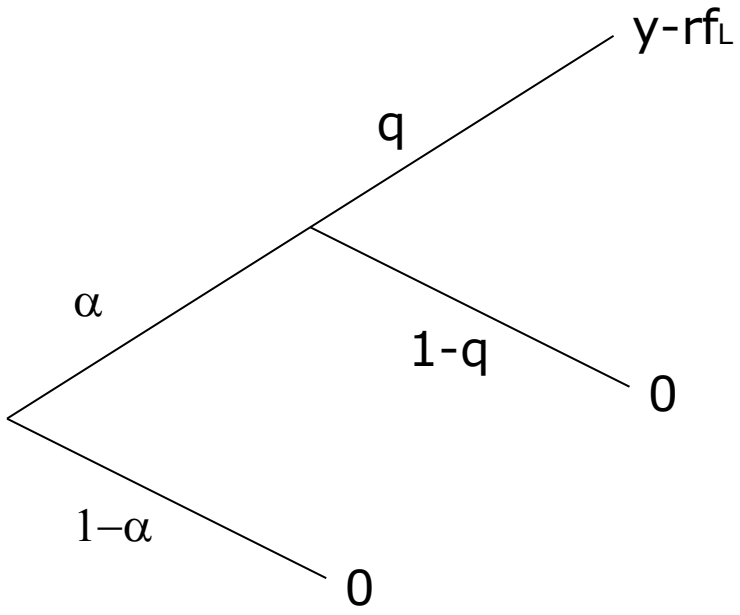


- If firms borrows FX, lower risk-free rate, but if devaluation occurs, it will not be able to pay back

$$\Pi^f = q(y - r_L^f)\alpha - \frac{c}{2}q^2$$

FX borrowing

- A more complicated payoff tree



- Tradeoff: exposure to ER risk / lower rate

Debt denomination choice

- If risk of devaluation is sufficiently low, and Δe large FX borrowing
- Domestic currency debt is like an insurance against a very unlikely risk
  - Lower rate effects dominates ER risk effect
- Systemic consequences
  - Higher q, lower idiosyncratic risk
  - But with prob. 1-α, large number of defaults
- Can tell similar story with variable versus fixed rates

Risk and currency denomination

- Who borrows in fx?
- **Result:** When the probability of a devaluation is sufficiently low:
  - Firms with higher agency problems borrow in the foreign currency
  - Firms with lower agency problems borrow in domestic currency
- Goes back to intuition that borrowing in fx acts as a bonding mechanism
- This is most important for high agency cost firms

Extension: Contagion risk

- Suppose that there are many firms
- If enough of them fail (or default), firms with successful projects become at risk of failure as well
  - Even if they borrowed domestically and are not exposed directly to devaluation risk

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  - **Why?** Profits when borrowing in fx are unaffected by contagion risk, while profits when borrowing in domestic currency go down

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- **Result:** Under some conditions, firms that would otherwise have borrowed domestically find it optimal to borrow in fx when subject to possible contagion
  - **Why?** Profits when borrowing in fx are unaffected by contagion risk, while profits when borrowing in domestic currency go down
- **Corollary:** Economy becomes more exposed to systemic devaluation risk

Systemic risk?

- We assume risk neutrality throughout
- Other than for contagion case, there are no substantial externalities
- Therefore, firms' borrowing choices are efficient
  - Fx borrowing, when optimal for firms, also implies superior average performance
  - Systemic risk arising from devaluation risk is irrelevant

Systemic risk?

- But it is easy to see that a social planner may have other concerns
  - In particular, may assign a significant negative cost if a large number of firms fail
- This generates a tradeoff of (average) firm performance versus systemic crisis
  - Policy solution may be to put limits on fx borrowing for unhedged firms
  - This may be particularly important when the risk of contagion is a real concern

Conclusion

- Simple model where firms can choose between domestic and foreign currency denominated debt
  - Limited liability problem leads to risk-shifting
  - This can be partly alleviated by "bonding" oneself through fx borrowing
- Cost: Increased probability of a systemic crisis
  - Particularly if one firm's failure can spill over to other firms
- Model applies more generally to situations where there is a lower cost alternative that introduces systemic risk
  - E.g., Short term versus long term borrowing and rollover risk