Rethinking the Effects of Financial Liberalization

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- What are the effects of financial liberalization? We focus on
  - consumption, investment, growth, and welfare
- Conventional view is that consumption stabilizes, investment and growth increase, and welfare improves
- But we know that in some countries financial liberalization has led to
  - increase in consumption volatility
  - current account surpluses
  - reduction in investment and growth
- Why does this happen? What are the welfare implications?

A model of asset trade with endogenous enforcement

- Two periods, Today and Tomorrow (with state $s \in S$ occurring with prob π_s)
- Consider a country with many individuals, $i \in I$, that maximize

$$u(c_{i0}) + \beta \cdot \int_{s \in S} \pi_s \cdot u(c_{is})$$

subject to

$$(c_{i0} - y_{i0}) + \int_{s \in S} \pi_s \cdot \frac{(c_{is} - y_{is})}{R_s} = 0$$

$$c_{is} \geq y_{is} \text{ if } s \notin E$$

FOC's are given by

$$u'(c_{is}) = \begin{cases} \dfrac{u'(c_{i0})}{\beta \cdot R_s} & \text{if } s \in U_i \\ u'(y_{is}) & \text{if } s \notin U_i \end{cases}$$

$$U_i = \{s \in S : s \in E \text{ or } u'(c_{i0}) \leq \beta \cdot R_s \cdot u'(y_{is})\}$$

where U_i are states for which borrowing constraint does not bind for i

- From now on we assume $u(\cdot) = \ln(\cdot)$
- What determines enforcement?
  - With strong institutions, $E = S$
  - With weak institutions, E results from maximizing ex-post average utility in each state

Autarky equilibrium

- Prices clear domestic markets

$$R_s = \begin{cases} \beta^{-1} \cdot \dfrac{y_s}{y_0} & \text{if } s \in E \\ 0 & \text{if } s \notin E \end{cases}$$

- Then $U_i = E$ and equilibrium consumption is

$$c_{i0} = \frac{\omega_i}{\omega} \cdot y_0 \quad \text{and} \quad c_{is} = \begin{cases} \dfrac{\omega_i}{\omega} \cdot y_s & \text{if } s \in E \\ y_{is} & \text{if } s \notin E \end{cases}$$

where $\dfrac{\omega_i}{\omega}$ is the relative wealth of i

$$\frac{\omega_i}{\omega} = \frac{\dfrac{y_{i0}}{y_0} + \beta \cdot \displaystyle\int_{s \in E} \pi_s \cdot \frac{y_{is}}{y_s}}{1 + \beta \cdot \displaystyle\int_{s \in E} \pi_s}$$

- If the country has weak institutions any proposed E must satisfy

$$\int_{i \in I} \ln c_{is} - \int_{i \in I} \ln y_{is} \geq 0 \quad \text{for all } s \in E$$

Trade equilibrium

- Rest-of-world has good institutions ($E^* = S$) and is large
- Prices clear world markets

$$R_s = R_s^* = \beta^{-1} \cdot \frac{y_s^*}{y_0^*} \text{ for all } s \in S$$

- Then $U_i \equiv \left\{ s \in S : s \in E \text{ or } \frac{y_{is}}{y_s^*} \leq \frac{\omega_i}{\omega^*} \right\}$ and equilibrium consumption is

$$c_{i0} = \frac{\omega_i}{\omega^*} \cdot y_0^* \text{ and } c_{is} = \begin{cases} \frac{\omega_i}{\omega^*} \cdot y_s^* & \text{if } s \in U_i \\ y_{is} & \text{if } s \notin U_i \end{cases}$$

where $\frac{\omega_i}{\omega^*}$ is the relative wealth of i

$$\frac{\omega_i}{\omega^*} = \frac{\frac{y_{i0}}{y_0^*} + \beta \cdot \int_{s \in U_i} \pi_s \cdot \frac{y_{is}}{y_s^*}}{1 + \beta \cdot \int_{s \in U_i} \pi_s}$$

- If the country has weak institutions any proposed E must satisfy

$$\int_{i \in I} \ln c_{is} - \int_{i \in I} \ln \left(y_{is} + x_{is}^* \right) \geq 0 \text{ for all } s \in E$$

The experiment

- Financial liberalization is a move from autarky to trade
- Before trade liberalization prices are

$$R_s = \begin{cases} \beta^{-1} \cdot \dfrac{y_s}{y_0} & \text{if } \; s \in E \\ 0 & \text{if } \; s \notin E \end{cases}$$

- Rest-of-world has strong institutions ($E^* = S$), flat endowments ($y_s^* = y_0^*$ for all $s \in S$), and is large
- After trade liberalization prices are

$$R_s = R_s^* = \beta^{-1} \;\text{ for all }\; s \in S$$

  - interest rate equal to (inverse of) time preference
  - insurance at actuarially fair prices

- Consider a country with high but uncertain growth potential

$$\int_{s \in S} \pi_s \cdot \left(\frac{y_s}{y_0} \right) \geq 1$$

- To simplify, we assume $S = \{G, B\}$ with $\pi_G = \pi_B = \dfrac{1}{2}$

Financial liberalization with strong institutions: the conventional view

- Before liberalization, individual and aggregate consumption move one-to-one

$$c_{i0} = \frac{\omega_i}{\omega} \cdot y_0, \;\; c_{iB} = \frac{\omega_i}{\omega} \cdot y_B, \;\; \text{and} \;\; c_{iG} = \frac{\omega_i}{\omega} \cdot y_G$$

$$c_0 = y_0, \;\; c_B = y_B, \;\; \text{and} \;\; c_G = y_G$$

where $\frac{\omega_i}{\omega}$ is the relative wealth of i

$$\frac{\omega_i}{\omega} = \frac{1}{1+\beta} \cdot \left(\frac{y_{i0}}{y_0} + \beta \cdot \frac{1}{2} \cdot \left(\frac{y_{iB}}{y_B} + \frac{y_{iG}}{y_G} \right) \right)$$

- After liberalization, individual and aggregate consumption are both flat

$$c_{i0} = c_{iB} = c_{iG} = \frac{1}{1+\beta} \cdot \left(y_{i0} + \beta \cdot \frac{1}{2} \cdot (y_{iB} + y_{iG}) \right)$$

$$c_0 = c_B = c_G = \frac{1}{1+\beta} \cdot \left(y_0 + \beta \cdot \frac{1}{2} \cdot (y_B + y_G) \right)$$

- Financial markets allow countries to smooth consumption over time and across states of nature

Financial liberalization revisited: the case of weak institutions

Example #1: WHY DO HIGH-GROWING COUNTRIES RUN CURRENT ACCOUNT SURPLUSES?

- (*Borrowing and lending model*) Assume $y_{iB} = y_{iG} = y_{i1}$, $y_1 > y_0$, and $\beta = 1$
- Assume $E^A = E^T = \varnothing$
- Before liberalization, there is both individual and country autarky

$$c_{i0} = y_{i0} \quad \text{and} \quad c_{i1} = y_{i1}$$
$$c_0 = y_0 \quad \text{and} \quad c_1 = y_1$$

- After liberalization, we have instead that

$$c_{i0} = \begin{cases} \frac{1}{2} \cdot (y_{i0} + y_{i1}) & \text{if } i \in I^U \\ y_{i0} & \text{if } i \notin I^U \end{cases} \quad \text{and} \quad c_{i1} = \begin{cases} \frac{1}{2} \cdot (y_{i0} + y_{i1}) & \text{if } i \in I^U \\ y_{i1} & \text{if } i \notin I^U \end{cases}$$

$$c_0 = y_0 - \frac{1}{2} \cdot \int_{i \in I^U} (y_{i0} - y_{i1}) \quad \text{and} \quad c_1 = y_1 + \frac{1}{2} \cdot \int_{i \in I^U} (y_{i0} - y_{i1})$$

where $I^U = \{i \in I \,|y_{i1} \leq y_{i0}\}$

- Liberalization leads to CA surplus and steeper aggregate consumption
- Welfare increases: $I - I^U$ are not affected, I^U are better off and lend now

Financial liberalization revisited: the case of weak institutions

Example #1: Why do high-growing countries run current account surpluses?

- How does financial liberalization affect enforcement?
- Before liberalization, there is enforcement if

$$\int_{i \in I} \ln \left(\frac{\omega_i}{\omega} \right)^A - \int_{i \in I} \ln \left(\frac{y_{i1}}{y_1} \right) \geq 0$$

- After liberalization, there is enforcement if

$$\int_{i \in I} \ln \left(\frac{\omega_i}{\omega} \right)^T - \int_{i \in I} \ln \left(\frac{y_{i1}}{y_1} \right) \geq \ln \frac{y_1}{\frac{1}{2} \cdot (y_0 + y_1)} \, (> 0)$$

- Unless *terms-of-trade* effects increase inequality a lot, incentives to enforce payments are reduced
  - Why? Not enforcing now brings the benefits of defaulting on foreign payments
- If financial liberalization lowers enforcement ($E^A = S$, $E^T = \varnothing$) $\Rightarrow$ CA surplus and lower welfare
  - Autarky borrowers become constrained and cannot borrow now
  - Autarky lenders lend at worst terms or become constrained

Financial liberalization revisited: the case of weak institutions

Example #2: WHY DOES FINANCIAL LIBERALIZATION INCREASE CONSUMPTION VOLATILITY?

- (*Insurance model*) Assume $y_G > y_B$ and $\beta = +\infty$
- Assume $E^A = E^T = \{B\}$
- Before liberalization, there is both individual and country autarky

$$c_{iB} = y_{iB} \text{ and } c_{iG} = y_{iG}$$

$$c_B = y_B \text{ and } c_G = y_G$$

- After liberalization, we have instead that

$$c_{iB} = \begin{cases} \frac{1}{2} \cdot (y_{iB} + y_{iG}) & \text{if } i \in I^U \\ y_{iB} & \text{if } i \notin I^U \end{cases} \text{ and } c_{iG} = \begin{cases} \frac{1}{2} \cdot (y_{iB} + y_{iG}) & \text{if } i \in I^U \\ y_{iG} & \text{if } i \notin I^U \end{cases}$$

$$c_B = y_B - \frac{1}{2} \cdot \int_{i \in I^U} (y_{iB} - y_{iG}) \text{ and } c_G = y_G + \frac{1}{2} \cdot \int_{i \in I^U} (y_{iB} - y_{iG})$$

where $I^U = \{i \in I \,| y_{iG} \leq y_{iB}\}$

- Aggregate consumption volatility increases
- Welfare increases: $I - I^U$ are not affected, I^U are better off and get insurance now
- If $E^A = E^T = \{G\}$, welfare still increases but aggregate consumption volatility decreases

Financial liberalization revisited: the case of weak institutions

Example #2: WHY DOES FINANCIAL LIBERALIZATION INCREASE CONSUMPTION VOLATILITY?

- How does financial liberalization affect enforcement?
- Before liberalization, there is enforcement if

$$\int_{i \in I} \ln \left(\frac{\omega_i}{\omega} \right)^A - \int_{i \in I} \ln \left(\frac{y_{iB}}{y_B} \right) \geq 0 \text{ and } \int_{i \in I} \ln \left(\frac{\omega_i}{\omega} \right)^A - \int_{i \in I} \ln \left(\frac{y_{iG}}{y_G} \right) \geq 0$$

- After liberalization, there is enforcement if

$$\int_{i \in I} \ln \left(\frac{\omega_i}{\omega} \right)^T - \int_{i \in I} \ln \left(\frac{y_{iB}}{y_B} \right) \geq 0 \text{ and } \int_{i \in I} \ln \left(\frac{\omega_i}{\omega} \right)^T - \int_{i \in I} \ln \left(\frac{y_{iG}}{y_G} \right) \geq \ln \frac{y_G}{\frac{1}{2} \cdot (y_B + y_G)} (> 0)$$

- Unless *terms-of-trade* effects increase inequality a lot
  - incentives to enforce are not affected in bad times
  - incentives to enforce are reduced in good times since it means defaulting on foreign payments
- If financial liberalization lowers enforcement in good times ($E^A = S$, $E^T = \{B\}$) $\Rightarrow$ higher consumption volatility and lower welfare
  - Pro-cyclical become constrained and cannot get insurance now
  - Counter-cyclical get insurance at worse terms or become constrained

Investment and growth

- Assume now that there is investment Today, k_i, and production Tomorrow, $F_{is}(k_i)$
- Individuals now maximize

$$\ln(c_{i0}) + \beta \cdot \int_{s \in S} \pi_s \cdot \ln(c_{is})$$

subject to

$$(c_{i0} + k_i - y_{i0}) + \int_{s \in S} \pi_s \cdot \frac{(c_{is} - F_{is}(k_i))}{R_s} \leq 0$$

$$c_{is} \geq y_{is} \text{ if } s \notin E$$

FOC's are given by

$$u'(c_{is}) = \begin{cases} \dfrac{u'(c_{i0})}{\beta \cdot R_s} & \text{if } s \in U_i \\ u'(F_{is}(k_i)) & \text{if } s \notin U_i \end{cases}$$

$$1 = \int_{s \in U_i} \pi_s \cdot \frac{1}{R_s} \cdot F'_{is}(k_i) + \int_{s \notin U_i} \pi_s \cdot \frac{\beta \cdot u'(F_{is}(k_i))}{u'(c_{i0})} \cdot F'_{is}(k_i)$$

$$U_i = \{s \in S : s \in E \text{ or } u'(c_{i0}) \leq \beta \cdot R_s \cdot u'(F_{is}(k_i))\}$$

- With strong institutions ($E^T = E^A = S$), financial liberalization raises investment and growth
- With weak institutions (E^T and E^A endogenous)
  - investment and growth might fall since unproductive individuals invest less and lend abroad
  - decline in enforcement and welfare more likely due to potential effect of liberalization on investment

Final remarks

- What are the effects of financial liberalization? We focus on
  - consumption, investment, growth, and welfare
- Conventional view is that consumption stabilizes, investment and growth increase, and welfare improves
- But we find that when institutions are weak financial liberalization might lead to
  - increase in consumption volatility
  - current account surpluses
  - reduction in investment and growth
  - decline in enforcement
- The net effect on welfare might be negative if the decline in enforcement is severe enough