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 \( \pi_s \))
- 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
  \[
  (c_{i0} - y_{i0}) + \int_{s \in S} \pi_s \cdot \frac{(c_{is} - y_{is})}{R_s} = 0
  \]
  \( c_{is} \geq y_{is} \) if \( s \notin E \)

  FOC’s are given by
  \[
  u'(c_{is}) = \begin{cases} 
  \frac{u'(c_{i0})}{\beta \cdot R_s} & \text{if } s \in U_i \\
  \frac{u'(y_{is})}{R_s} & \text{if } s \notin U_i 
  \end{cases}
  \]
  \[
  U_i = \{ s \in S : s \in E \text{ or } u'(c_{i0}) \leq \beta \cdot R_s \cdot u'(y_{is}) \}
  \]

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

- Then \( U_i = E \) and equilibrium consumption is
  \[ c_i = \frac{\omega_i}{\omega} \cdot y_0 \quad \text{and} \quad c_s = \begin{cases} \frac{\omega_i}{\omega} \cdot y_s & \text{if } s \in E \\ \frac{\omega_i}{y_is} & \text{if } s \notin E \end{cases} \]
  where \( \frac{\omega_i}{\omega} \) is the relative wealth of \( i \)

\[ \frac{\omega_i}{\omega} = \frac{y_i0}{y_0} + \beta \cdot \int_{s \in E} \frac{\pi_s \cdot y_s}{y_is} \\
1 + \beta \cdot \int_{s \in E} \pi_s \]

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

- 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
  \[ c_{i0} = \frac{\omega_i}{\omega^*} \cdot y_s^* \text{ and } c_{is} = \begin{cases} \frac{\omega_i}{\omega^*} \cdot y_s^* & \text{if } s \in U_i \\ \frac{\omega_i}{y_{is}} & \text{if } s \notin U_i \end{cases} \]
  where \(\frac{\omega_i}{\omega^*}\) is the relative wealth of \(i\)

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

- If the country has weak institutions any proposed \(E\) must satisfy
  \[ \int_{i \in I} \ln c_{is} - \int_{i \in I} \ln (y_{is} + x_{is}^*) \geq 0 \text{ for all } s \in E \]
The experiment

- Financial liberalization is a move from autarky to trade

- Before trade liberalization prices are

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

- Rest-of-world has strong institutions \((E^* = S)\), flat endowments \((y_s^* = y_0^* \text{ for all } s \in S)\), 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 \( \pi_G = \pi_B = \frac{1}{2} \)
Financial liberalization with strong institutions: the conventional view

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

\[ c_{i0} = \frac{\omega_i}{\omega} \cdot y_0, \quad c_{iB} = \frac{\omega_i}{\omega} \cdot y_B, \quad \text{and} \quad c_{iG} = \frac{\omega_i}{\omega} \cdot y_G \]

\[ c_0 = y_0, \quad c_B = y_B, \quad \text{and} \quad c_G = y_G \]

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 $y_{iB} = y_{iG} = y_i$, $y_1 > y_0$, and $\beta = 1$
- Assume $E^A = E^T = \emptyset$
- Before liberalization, there is both individual and country autarky
  
  $$c_{i0} = y_{i0} \quad \text{and} \quad c_{i1} = y_i$$
  $$c_0 = y_0 \quad \text{and} \quad c_1 = y_1$$

- After liberalization, we have instead that
  
  $$c_{i0} = \begin{cases} 
  \frac{1}{2} \cdot (y_{i0} + y_i) & \text{if } i \in I^U \\
  y_{i0} & \text{if } i \notin I^U 
  \end{cases} \quad \text{and} \quad c_{i1} = \begin{cases} 
  \frac{1}{2} \cdot (y_{i0} + y_i) & \text{if } i \in I^U \\
  y_i & \text{if } i \notin I^U 
  \end{cases}$$

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

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

- 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-growth countries run current account surpluses?

- How does financial liberalization affect enforcement?
- Before liberalization, there is enforcement if
  \[
  \int_{i \in I} \ln \left( \frac{\omega_i}{\omega} \right)^A - \int_{i \in I} \ln \left( \frac{y_i}{y_1} \right) \geq 0
  \]
- After liberalization, there is enforcement if
  \[
  \int_{i \in I} \ln \left( \frac{\omega_i}{\omega} \right)^T - \int_{i \in I} \ln \left( \frac{y_i}{y_1} \right) \geq \ln \frac{y_1}{\frac{1}{2} \cdot (y_0 + y_1)} (> 0)
  \]
- 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 \((E^A = S, \ E^T = \emptyset)\) \(\Rightarrow\) 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
  \[
  c_{iB} = y_{iB} \quad \text{and} \quad c_{iG} = y_{iG} \\
  c_B = y_B \quad \text{and} \quad c_G = y_G
  \]
- After liberalization, we have instead that
  \[
  c_{iB} = \begin{cases} 
  \frac{1}{2} \cdot (y_{iB} + y_{iG}) & \text{if } i \in I^U \\
  y_{iB} & \text{if } i \notin I^U 
  \end{cases} \\
  c_B = y_B - \frac{1}{2} \cdot \int_{i \in I^U} (y_{iB} - y_{iG}) \\
  \quad \text{and} \quad c_{iG} = \begin{cases} 
  \frac{1}{2} \cdot (y_{iB} + y_{iG}) & \text{if } i \in I^U \\
  y_{iG} & \text{if } i \notin I^U 
  \end{cases} \\
  c_G = y_G + \frac{1}{2} \cdot \int_{i \in I^U} (y_{iB} - y_{iG})
  \]
  where $I^U = \{i \in I \mid y_{iG} \leq y_{iB}\}$
- 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

\[
\int_{i \in I} \ln \left( \frac{\omega_i}{\omega} \right)^A - \int_{i \in I} \ln \left( \frac{y_iB}{yB} \right) \geq 0 \quad \text{and} \quad \int_{i \in I} \ln \left( \frac{\omega_i}{\omega} \right)^A - \int_{i \in I} \ln \left( \frac{y_iG}{yG} \right) \geq 0
\]

- After liberalization, there is enforcement if

\[
\int_{i \in I} \ln \left( \frac{\omega_i}{\omega} \right)^T - \int_{i \in I} \ln \left( \frac{y_iB}{yB} \right) \geq 0 \quad \text{and} \quad \int_{i \in I} \ln \left( \frac{\omega_i}{\omega} \right)^T - \int_{i \in I} \ln \left( \frac{y_iG}{yG} \right) \geq \ln \frac{yG}{\frac{1}{2} \cdot (y_B + y_G)} (> 0)
\]

- 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 \((E^A = S, E^T = \{B\})\) ⇒ 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
  \[
  u'(c_{is}) = \begin{cases} u'(c_{i0}) & \text{if } s \in U_i \\ \frac{\beta}{R_s} & \text{if } s \notin U_i \\ u'(F_{is}(k_i)) & \text{if } s \notin U_i \end{cases}
  \]
  \[
  1 = \int_{s \in U_i} \pi_s \cdot \frac{1}{R_s} \cdot F'_{is}(k_i) + \int_{s \notin U_i} \pi_s \cdot \frac{\beta \cdot u'(F_{is}(k_i))}{u'(c_{i0})} \cdot F'_{is}(k_i)
  \]
  \[
  U_i = \{s \in S : s \in E \text{ or } u'(c_{i0}) \leq \beta \cdot R_s \cdot u'(F_{is}(k_i))\}
  \]
- 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