

Banking Across Borders

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Board of Governors

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- ① Motivation
- ② Facts
- ③ The Model
- ④ Concluding Remarks

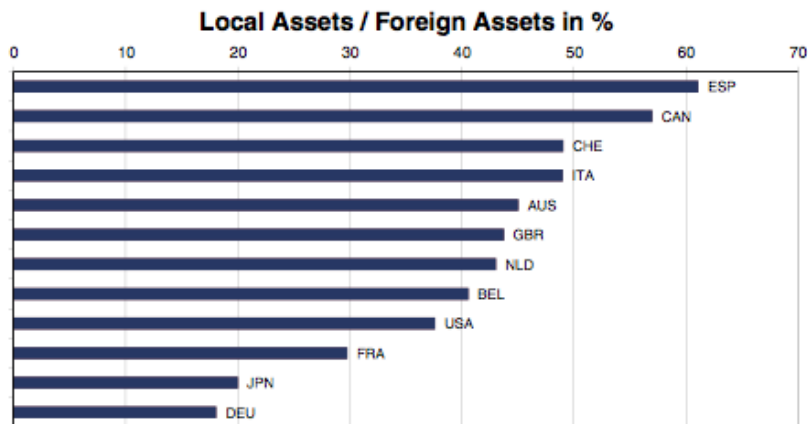
- Increasing importance of international financial linkages in the global economy
- Why and how international bank linkages are created
 - Portfolio Theory vs Trade approach

Heterogeneity across countries:

- Operations cross-border from home or through foreign affiliates
- Liability-asset gaps
- Foreign bank participation

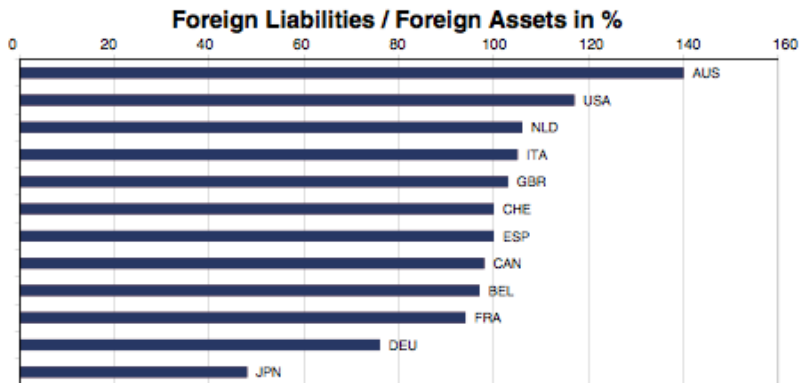
Facts

Operations cross-border from home or through foreign affiliates



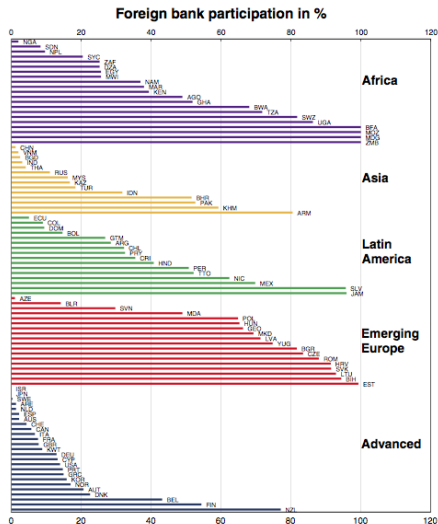
Facts

Liability-asset gaps



Facts

Foreign bank participation



The Model

Closed Economy

Timeline: (2 periods)

- Endowment: Capital K and labor L . Capital owned by K capitalists.
- At $t = 1$, Capitalists chose between depositor or entrepreneur
 - At $t = 2$, depositor receives at least $1 + r$
- Entrepreneur: Fixed amount of capital $z > 1$ and flexible amount of l
- Production technology CRS $F(l, z)$.
- Additional borrowing from bank $x = z - 1$
- Bank receives service fee c proportionate to size x . $c \rightarrow$ efficiency of banking sector in the economy

The Model

Closed Economy

- Market clearing conditions: $N = K/z$, $l = L/N$
- Returns:
 - $R = 1 + F_z(z, l) = 1 + F_z(1, z/l) = 1 + F_K(1, K/L)$
 - $w = F_l(z, l) = F_L(1, K/L)$
- Determine financial interest rate $1 + r$
 - $\pi = zR - c(z - 1) - (1 + r)(z - 1) = 1 + r$
 - $1 + r = R - c \frac{z-1}{z} = (1 + F_K(K/L)) - c \frac{z-1}{z}$

Two countries: Country $i, j \in \{1, 2\}$

- Different endowments and banking sector efficiencies
- Immobile workers, entrepreneurs and depositors
- Bank in country $j \in \{1, 2\}$ lends to entrepreneur in country $i \in \{1, 2\}$ with $i \neq j$, \Rightarrow additional cost $\tau_{ij} > 0$
- Bank in country $j \in \{1, 2\}$ borrows from country $i \in \{1, 2\}$ with $i \neq j$, \Rightarrow additional cost $t_{ij} > 0$.
- τ_{ij} : capital account openness, t_{ij} : banking sector liberalization.

The Model

Open Economy

- Intermediation cost: $c_j(D_{ji}) = a_j(1 + D_{ji}/K_j)^\gamma$
 - D_{ji} : foreign deposit j intermediates
 - K_j : capacity of j
 - D_{ji} can be negative: reversal of deposit flow.
- Reallocation of capital: K_{ji} capital flow from i to j .
 - $R_j = 1 + F_K(1, \frac{K_j + K_{ji}}{L_j})$
 - K_{ji} can be also negative: reversal of capital flow.
- Financial interest rate: $1 + r_j = R_j(K_{ji}) - c_j(D_{ji})^{\frac{z-1}{z}}$

The Model

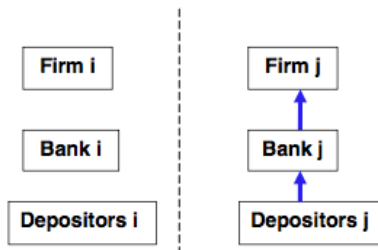
Open Economy: Equilibria

Entrepreneur $i \in \{1, 2\}$ maximizes profit by minimizing cost of external finance. Different factor endowments and banking sector efficiencies four different equilibria arise.

- Domestic Banking
- International Banking
- Global Banking
- Foreign Sourcing

The Model

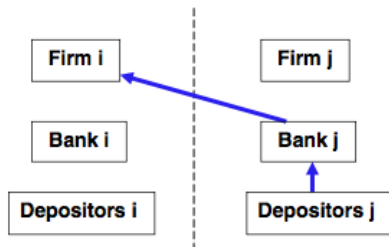
Open Economy: Domestic Banking



- Firm's financing cost: $c_j + 1 + r_j$
- Bank j's balance sheet: $A_{ji} = 0$ and $L_{ji} = 0$

The Model

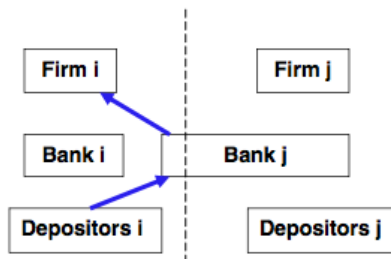
Open Economy: International Banking



- Firm i's financing cost: $c_j + \tau_{ij} + 1 + r_j$
- Bank j's balance sheet: $A_{ij} > 0$ and $L_{ij} = 0$

The Model

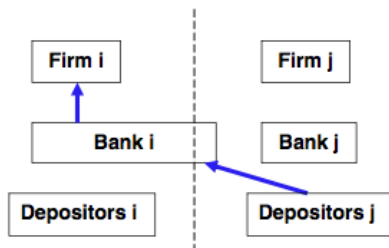
Open Economy: Global Banking



- Firm i's financing cost: $c_j + \tau_{ij} + 1 + r_i + t_{ij}$
- Bank j's balance sheet: $A_{ij} = L_{ij}$

The Model

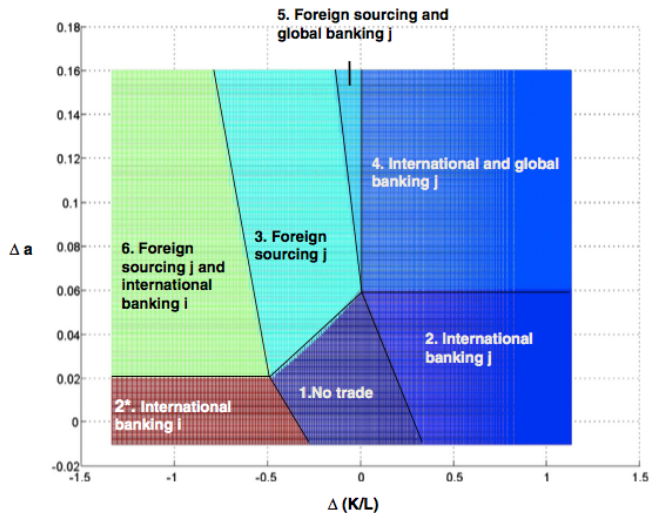
Open Economy: Foreign Sourcing



- Firm i's financing cost: $c_i + 1 + r_j + t_{ij}$
- Bank i's balance sheet: $L_{ji} > 0$

The Model

Open Economy: Different equilibrium cases



Concluding Remark

- International trade model of cross-border banking
- Captures heterogeneity in data