# Discussion of "Global Bank Lending and Exchange Rates" by Becker, Schmeling, and Schrimpf

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# Motivation

- Recent advances in international finance with imperfect financial markets (Maggiori 2022 Handbook Chapter)
    - to understand financial crises and the ensuing policy response (e.g., Quantitative Easing and FX intervention)
    - deviations from arbitrage (CIP deviations)
    - more generally the impact of capital flows on exchange rate

This paper:

- Banks' cross-currency lending flows affects FX
- Micro data and estimation with GIV
- Valuable evidence supporting this rising literature
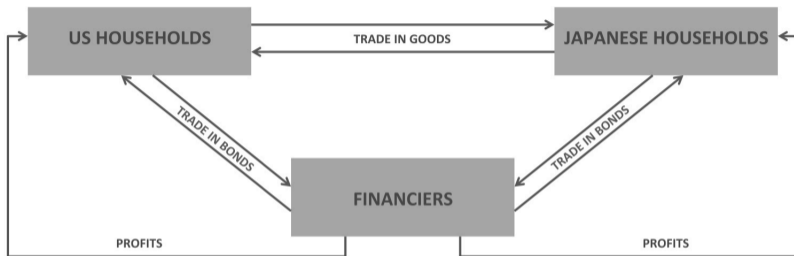
# Complete Market Benchmark

- Exchange rate is the SDF differentials

$$e_t = m_t^* - m_t$$

- No role for quantity and demand elasticity

# A Model with Financial Frictions

- Gabaix and Maggiori (2015)



- Preference shocks generates international trade and capital flows

$$C_t = [C_{NT,t}^{\chi_t} C_{H,t}^{a_t} C_{F,t}^{\iota_t}]^{\frac{1}{\chi_t + a_t + \iota_t}}$$

$$\underbrace{\xi_0 e_0 - \iota_0}_{NX} + \underbrace{q_0}_{financier\ position} + \underbrace{f^*}_{exo\ flow} = 0$$

# A Model with Financial Frictions

- Financiers intermediate capital flows and take expected excess returns, limited by the constraint

$$\max_{q_0} V_0 = E[\beta(R - R^* \frac{e_1}{e_0})]q_0$$

$$s.t. \ V_0 \geq \Gamma q_0^2 / e_0$$

- demand function: larger demand for higher expected return

$$q_0 = \frac{e_0}{\Gamma R} E[R - R^* \frac{e_1}{e_0}]$$

# Implication 1: When foreign banks increase their lending in USD, the USD appreciates

- Exchange rate level

$$e_0 = \frac{(1 + \Gamma)\iota_0 + E(\iota_1) - \Gamma f^*}{2 + \Gamma}$$

- Trade (endowment, productivity, preference) shock $\iota_0 \uparrow$
    - RHS: US capital inflow, dollar lending is $q_0 \uparrow$
    - LHS: expected return on dollar $E[r - r^* \frac{e_1}{e_0}] \uparrow$, dollar depreciate $e_0 \uparrow$

- Exogenous flow for dollar $f^* \uparrow$
    - RHS: dollar lending is $f^* \uparrow$
    - LHS: financier dollar position $q_0 \downarrow$, expected return on dollar $E[r - r^* \frac{e_1}{e_0}] \downarrow$, dollar appreciate $e_0 \downarrow$

- Endogeneity (simultaneity): exogenous-lending and macro-driven lending have the opposite results

# Implication 2: Tighter USD funding conditions amplify the effect

- Exchange rate level

$$e_0 = \frac{(1+\Gamma)\iota_0 + E(\iota_1) - \Gamma f^*}{2 + \Gamma}$$

- Tighter USD funding conditions: larger $\Gamma$
  - low broker-dealer leverage

|  | Low Leverage | High Leverage |
|---|---|---|
| $\Delta NCCL_{c,t}$ | 78.29 | -35.31 |
|  | (25.65) | (76.72) |

  - low US bank reserve holdings
  - low share of interbank loans granted to foreign banks
  - a higher concentration of reserves among the major US banks

|  | Share of reserves | | Share of loans to foreign banks | | Reserve concentration | |
|---|---|---|---|---|---|---|
|  | High | Low | High | Low | High | Low |
| $\Delta NCCL_{c,t}$ | -68.43 | 98.69 | -0.803 | 134.7 | 79.63 | 47.85 |
|  | (50.51) | (22.88) | (48.34) | (38.17) | (29.88) | (34.43) |

# Implication 2: Tighter USD funding conditions amplify the effect

- Tighter USD funding conditions:
  - monetary policy cycles

|  | Fed Cycle | | |
| --- | --- | --- | --- |
|  | Hike | No Change | Ease |
| $\Delta NCCL_{c,t}$ | 100.9 | 21.20 | -22.38 |
|  | (18.87) | (49.83) | (144.7) |

- Suggestion: policy rate levels
  - 6% to 5% (easing) is tighter than 1% to 2% (hiking)

# Implication 2: Higher intermediation costs for FX swap providers amplify the effect

- $f^*$ takes currency risk: short euro, long dollar
- For part of the lending, lenders swap the liability with a financier to short synthetic dollar
- Financier: long synthetic dollar, short dollar, subject to a constraint
- Pre-GFC, little constraint, dollar lending $\uparrow\uparrow$, $f^*\uparrow$, $e\downarrow$
- Post-GFC, large constraint, dollar lending $\uparrow\uparrow$, $f^*\uparrow\uparrow$, $e\downarrow\downarrow$

| | Pre-GFC | | | Post-GFC | | |
|---|---|---|---|---|---|---|
| $\Delta\mathrm{NCCL}_{c,t}$ | 26.63 | 14.40 | 18.90 | 125.6 | 110.4 | 71.95 |
| | (15.05) | (25.91) | (18.98) | (26.63) | (18.56) | (18.04) |

# Implication 3: Higher net lending flows should lead to larger CIP deviations

- Financier: long synthetic dollar, short dollar, subject to a constraint

$$f^{cip} = \frac{e_0}{\Gamma^{cip}R}[R^*\frac{f_0}{e_0} - R]$$

- CIP deviation $R^*\frac{f_0}{e_0} - R > 0$, widen with $f^{cip}$
- Endogeneity (reverse causality): Avdjiev et al (2019) triangular relationship:
    - LHS: dollar ↑, borrower risk ↑
    - RHS: dollar lending ↓
    - CIP deviations ↑

## Comment: Convenience Yield

- Investors' utility

$$u(c_t, f_t^*) = \underbrace{w(c_t)}_{utility\ from\ C} + v(\ \underbrace{f_t^*}\ ;\ \underbrace{\theta_t}\ )$$
$$USD\ bond\ demand\ shifter$$

- Exchange rate level (Jiang, Krishnamurthy, Lustig (2020))

$$e_t = -E_t \sum_{\tau=0}^{\infty} \lambda_{t+\tau} + E_t \sum_{\tau=0}^{\infty} (r_{t+\tau}^* - r_{t+\tau}) - E_t \sum_{\tau=0}^{\infty} rp_{t+\tau} + E_t \lim_{\tau \to \infty} e_{t+\tau}$$

- Convenience yield $\lambda_{t+\tau} = \frac{v'(f_t^*; \theta_t)}{w'(c_t)} > 0$
- Demand shifter $\theta_t \uparrow$
    - RHS: convenience yield $\lambda_t \uparrow$, lending in dollar $f_t^* \uparrow$
    - LHS: dollar appreciates $e_t \downarrow$
    - financier dollar position $q_0 \downarrow$, expected return on dollar $E[r - r^* \frac{e_1}{e_0}] \downarrow$, dollar appreciate $e_0 \downarrow$
- Question: how much is $\lambda_t$ and how much is $rp_t$?

# Comment: Economics Magnitude

- The economic magnitude is useful to
    - policy practice (FX intervention)
    - discipline model parameters
- An increase in foreign banks' outstanding USD loans by 100 bp results in
    - an appreciation of the USD by 72 bp
    - an increase of CIP deviation by 2-4 bps
    - Avdjiev et al (2019): "a 1 percent appreciation of the broad dollar index is associated with a 2.4 basis point decrease in the cross-currency basis"
- "42.25bn USD additional net lending flow into the USD, leads to an appreciation of the USD by 36 basis points"
    - net exports 700 bn USD, appreciate 6%
    - GM: "the flow is comparable to 1 year worth of US net exports would induce the Dollar to appreciate 10%"

# Comment: US Specialty

- The analyses are not specific to US
- Suggestion: consider variations in different currencies
  - interact $\Delta NCCL_{c,t}$ with CIP in currency c
  - countries with large negative basis (Japan) have a large elasticity
  - countries with positive basis (Australia) have a small elasticity
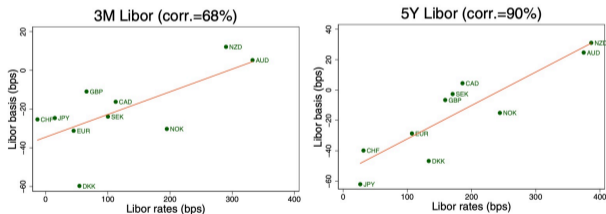


- Suggestion: consider net cross-currency bank lending in other currencies
  - segmented local currencies with illiquid swap: large elasticity and effect on CIP
  - global currencies: small elasticity

## Comment: Instrument

$$NCCL = loan\ c\ to\ US - loan\ US\ to\ c$$

$$\Delta_{c,t}^{inflow} = \sum_{j \in c} \Delta l_{j,USD,t}^c \times w_{j,t-1}^c - \frac{1}{N_c} \sum_{j \in c} \Delta l_{j,USD,t}^c$$

$$\Delta_{c,t}^{outflow} = \sum_{j \in US} \Delta l_{j,c,t}^c \times w_{j,t-1}^c - \frac{1}{N_{US}} \sum_{j \in US} \Delta l_{j,c,t}^c$$

$$\Delta z_t = \Delta_{c,t}^{inflow} - \Delta_{c,t}^{outlow}$$

- Suggestion: consider $\Delta_{c,t}^{inflow}$ and $\Delta_{c,t}^{outflow}$ separately
  - USD elasticity may be different from c
- Suggestion: consider interbank loans granted to foreign banks in the US as $\Delta l_j$

# Conclusion

- Highly recommend!
- A lot of new thought-provoking facts
- The results support past research and guide future research