Dealer Risk Limits and Currency Returns

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Why we care?

- Financial intermediaries are not a veil.
  - E.g., He and Krishnamurthy (2013), Haddad and Muir (2021).
- Financial intermediaries are thought to have limited risk-bearing capacities.
  - Risk-aversion: Gabaix and Maggiori (2015).
  - Liquidity: Kondor and Vayanos (2019).
  - Regulation: Du, Hébert, and Huber (2022).
- Implications:
  - Intermediaries' customers face an upward sloping supply curve.
  - Customer demand shocks move asset prices.
- Limited empirical evidence.
  - Du and Huber (2024) document correlation between higher FX hedging demand and widening CIP deviations.

This paper

- First paper to show that intermediary's limited risk-bearing capacity causally affects FX.
- Impressive on many dimension:
  - Important question.
  - Clear theoretical framework.
  - Thoughtful empirics:
    - Rich and novel data: TWO confidential regulatory datasets that give unique glimpse into measures of dealer constraints.
    - Careful execution: one of the few papers that implements GIV in the true spirit of Gabaix and Koijen (2023).

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- A 10-minute discussion simply won't do justice to this paper!
- Today's highlight: the mapping of model $\rightarrow$ empirics.
  - Goal: help contextualize the takeaway of the paper.

Model recap

- Three agents: customers (D), suppliers (F), intermediary.
- Intermediary connects D with F:
  - Charging spread (s) and absorbing imbalance if necessary (δ).
    - Knowing D and F, intermediary sets s to achieve the desired $\delta = D - F$.
    - s and δ are not two separate decisions.
  - Maximizing profit (π) taking as given FX (e, more precisely, $e = f(D, S)$).

$$\max_{s,\delta} \pi = s(D(e+s) + F(e-s)) + \delta e - \frac{\gamma}{2}\delta^2$$

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- Main prediction: tighter regulatory limits ($\gamma \uparrow$) magnifies impact of D on e.
  - E.g., $D \uparrow \rightarrow \delta \uparrow$. To induce intermediary to hold higher position, $e \uparrow$.
  - Intuition goes through if there is no s, though s may be helpful to match to data.

Comparison to Gabaix and Maggiori (2015) (GaMa)

- Definition of "intermediary" and sources of limited risk-bearing capacity.
  - "Intermediary" in GaMa absorb all FX imbalance, and their limited capacity is due to (1) risk aversion, (2) risk in FX.
    - Maps to the F in this model.
  - "Intermediary" here worries only about residual: δ. Limited capacity is due to (1) regulatory cap (stated), (2) ability to match D and F (implicit).

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- Purpose of model and implications for empirics.
  - Model in GaMa is for illustrating the economics, suffices to have two currencies.
  - Model here is to guide empirics. Two currencies may still be an intuitive starting point. Though important to think through implications.

The world of $N > 2$ currencies

- Implication 1: magnitude of currency n's depreciation against USD cannot be interpreted as the amount of appreciation of USD.
  - A 5% depreciation of JPY relative to USD does not mean that a 5% appreciation of USD against all currencies.

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- Implication 2: 1 unit of demand shock in currency j may not have the same effect on e as 1 unit of demand shock in currency k.
  - Demand shock matters to intermediary only to the extent that the intermediary cannot offload to supply (F) and end up with $\delta \neq 0$.
  - Flows can be correlated across currencies because agents trade in bundles to execute a strategy, e.g., buy AUD and sell JPY.
  - $\Rightarrow$ Some demand shocks will be much easier to absorb than others.

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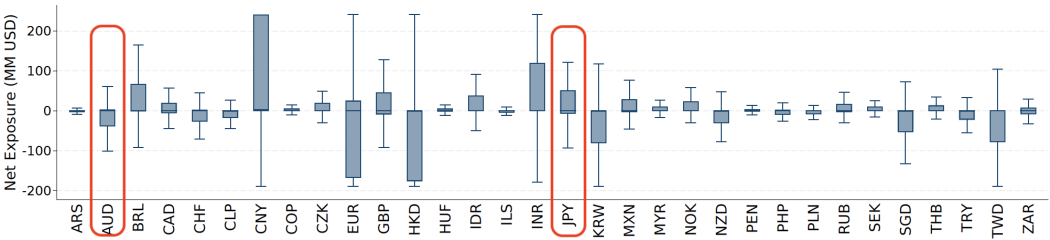
- Consider the following:
  - A negative Australian sovereign CDS shock $\rightarrow$ customers (D) sell AUD.
  - Intermediary needs to absorb AUD that can't be sold to suppliers (F).
  - Because AUD is a popular carry trade currency, F happily buys up AUD, leaving little δ.

Evidence of bundled trading

Figure 4: Aggregate Deltas and Turnover, by Currency

(a) Delta Distribution in our sample



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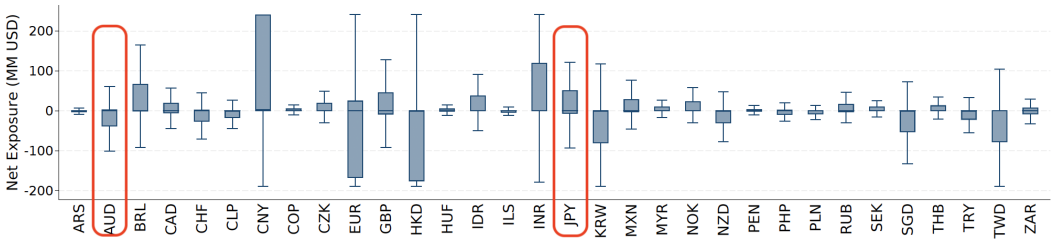

- Upshot: β in $\Delta FX_{c,t} \sim LimitShock_{c,t} \times DemandShifter_{c,t}$ is estimated from demand shocks with disparate impact on e.
- To better interpret the magnitude of β, we need to know the cross-elasticity between currencies from which the demand shocks come.

Complex cross-elasticity among currencies

Figure 1: An and Huber (2024) estimated cross-elasticity in bps from $1B flow

	AUD	CAD	GBP	CHF	EUR	JPY
AUD	13.08	8.88	7.32	2.59	2.19	2.58

- What intermediaries care about: accommodating flows into a RISK FACTOR, *not necessarily flows into a currency.*
  - An and Huber (2024) decompose observed FX flows into flows to *traded* risk factors; estimate price response to a marginal unit of *risk*; then map to currency cross-elasticity.
- Substantial and varied cross-currency elasticity.
  - Magnitude of sample-average β crucially depends on composition of currencies.
  - No easy generalization from sample average to population average as cross-elasticity depends on risk exposure and is not randomly distributed.

Conclusion

- A great paper that marries clear theoretical framework with careful empirical execution to answer an important question:
  - Do dealers' limited risk-bearing capacity matter for FX?
- As models are only abstractions of the complex real world, mapping the model to empirics is *the* challenge in all empirical work.
- Often, while the broad conclusion remains the same, careful interpretation of the magnitude can really help the reader understand the frontier of knowledge.

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