UNIVERSITY of VIRGINIA

DARDEN SCHOOL OF BUSINESS

Intermediary Elasticity and Limited Risk-Bearing Capacity

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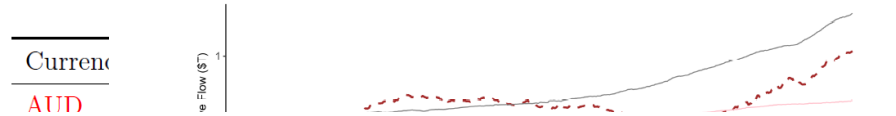
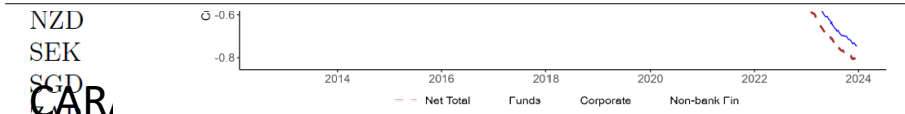
The Paper

- This paper estimates **intermediaries' elasticity**: The price response to one unit of traded FX risk.
- Trading affects their risk-bearing capacity. By changing risk quantity, FX-flows impact FX-pricing.
  - And pricing of other assets! Risk cap is a shared resource
- Find 3 traded FX factors: Dollar, Carry, € – ¥
- Quantify factor-specific elasticity, used to determine own- and cross-currencies (using issuances as IV).
  - Also, cross-class: CDS, commodities, corporates, equities, options, US Treasuries, can be explained by FX risk factors, can calculate elasticities of CDS to UST via FX.

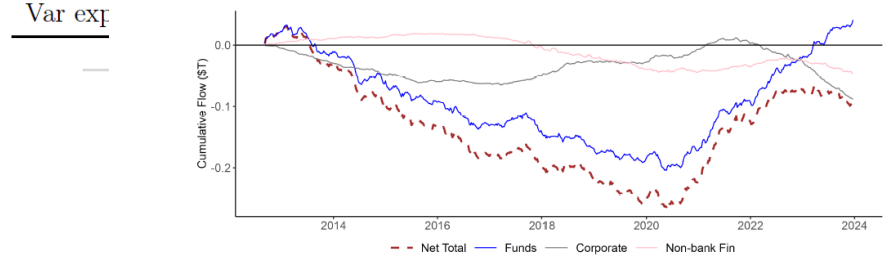
Figure 1: **Cumulative Flow by Investor Type to Top 3 Traded FX Factors**



	Dollar		Carry		Euro-Yen	
	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Factor flow	0.072***	0.107***	0.132***	0.138**	0.139***	0.335*
	(0.009)	(0.037)	(0.018)	(0.064)	(0.021)	(0.195)
1st stage F-stat		24.8		6.5		3.8
Anderson-Rubin CI				(0.01, 2.39)		(0.09, 1.91)
Observations	590	386	590	228	590	560



(b) **Carry Factor**



(c) **Euro-Yen Factor**

My Questions

- Who are the “representative banks”?
- What is the exact mechanism linking primary auctions and FX flows?
- Can you provide context for the quantification exercises?

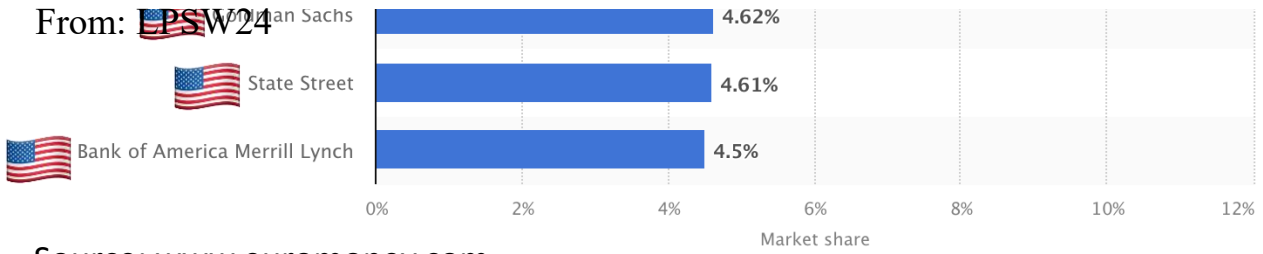
1
Who are the representative banks?

- Recent papers: Moretti, Pandolfi, Schmukler, Villegas-Bauer, Williams (2024), Loualiche, Pecora, Somogyi, Ward (2024), Jiang, Richmond, Zhang (2024).
- LPSW24 uses CLS data. They make a valiant effort to disentangle in the data between "Non-Dealer Banks" and "Dealer Banks".
- Who are the banks?
  - The authors group together banks. "Intermediaries risk provision" angle speaks to dealers, not to banks.
  - Not all dealers are FX dealers. Implication?
  - Not all dealers are American. Implication?
  - What is the assumption about market power?

Leading foreign exchange trading services worldwide as of 2020, by market share

	Corporates		Funds		NBFIs		Non-dealer banks	
	Std.	Share	Std.	Share	Std.	Share	Std.	Share
USDAUD	0.42	0.36	2.65	10.98	0.46	3.18	3.97	85.49
USDCAD	0.70	0.29	15.58	10.40	1.03	1.98	31.40	87.33
USDCHF	0.57	0.90	2.41	9.06	1.45	4.17	4.27	85.87
USDEUR	3.46	2.19	11.39	13.78	1.45	3.18	14.67	80.85
USDGBP	1.23	1.00	5.82	13.02	1.56	3.56	7.96	82.42
USDJPY	0.94	0.85	4.81	8.93	0.96	3.14	6.19	87.08
USDNOK	0.12	0.45	0.58	12.75	0.10	2.94	1.55	83.86
USDNZD	0.04	0.08	1.18	7.30	0.15	3.46	1.68	89.16
USDSEK	0.18	1.18	0.97	20.78	0.12	2.78	1.64	75.26

From: LPSW24



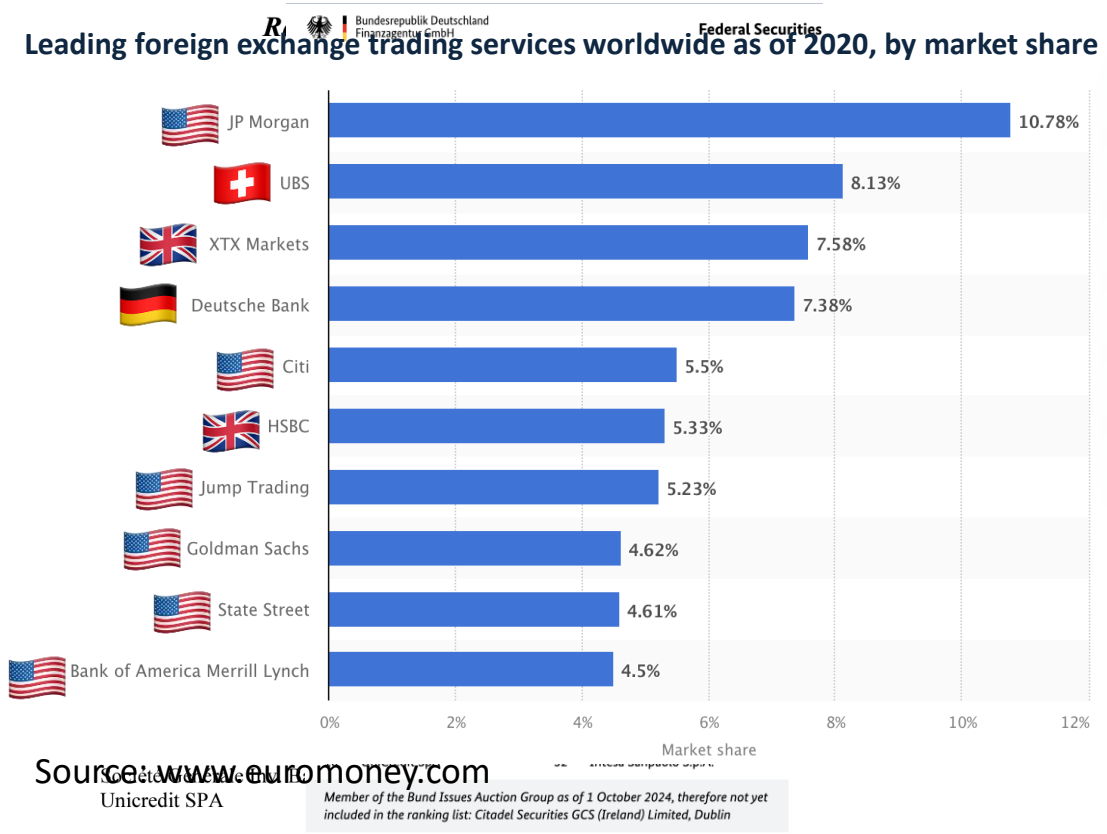
Source: www.euromoney.com

How does the representative bank look like?

2
The mechanism linking primary auctions and FX flows

- The IV approach allows authors to isolate the λ_1 in $r_1 = \lambda_1 \, q_1 \mathrm{var}\left(\mathbf{b_1^T R}\right) + \boldsymbol{b}_1^T \boldsymbol{R}$
  - Regress $\frac{r_{1t}}{var(r_{1t})} = \lambda_1 \widehat{q_{1t}} + \varepsilon_{1t}$
  - Instrument q_1 using bond's announced amount in week t

- How does the instrument work?
  - Are FX dealers buying on their own behalf and then hedging their FX?
  - Are FX dealer not participating but they intermediate auctions participants' FX flows?
    - The two options suggest offsetting signs
    - Not sure DE IT and FR are bought for the same reasons (and FX-hedge), some announcements take place the week before the actual issuance…
    - Not my view: Amounts raised depend on yields, which in turn depend on FX via CIP.



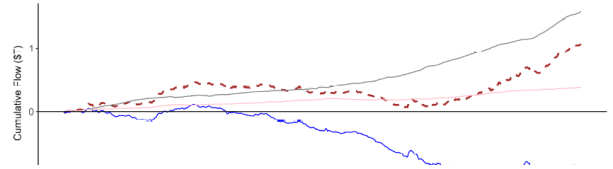
Source: www.euromoney.com

What is the exact mechanism linking primary auctions and FX flows?

3
"Qualifying" the quantifications

- I would have thought that risk held by dealers hovers near zero. In MMS, we think of dealers carrying a zero inventory.
- But banks have accumulated
  - $1 tr of USD + $0.6 tr of (short)carry + $0.1 tr of USD-EUR exposure =$1.7 tr of undiversifiable FX risk
- Around 40% of total return for the dollar factor is explained by trading flows into the factor
  - This is a high fraction. What would be a comparable quantity for, say, the equity or sovereign bond market?
  - (Anderson-Rubin upper bound would imply even higher %!)

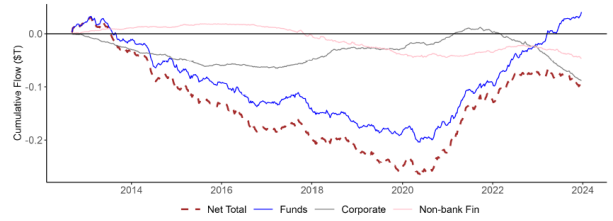
Figure 1: **Cumulative Flow by Investor Type to Top 3 Traded FX Factors**



	Int. elasticity (IV) λ_k	Return volatility $\sigma(r_{k,t})$	Price impact per $B flow $\lambda_k\sigma^2(r_{k,t})$	Flow volatility $\sigma(q_{k,t})$	Return var due to flow $\lambda_k^2\sigma^2(r_{k,t})\sigma^2(q_{k,t})$
Dollar	0.11	6.9%	5.0 bps	84.5 $B	38.6%
Carry	0.14	8.2%	9.3 bps	34.0 $B	14.8%
Euro-Yen	0.34	9.4%	29.3 bps	22.0 $B	47.6%

Notes: This table quantifies the economic magnitude of intermediary elasticity for the Dollar, Carry, and Euro-Yen factors. The columns report, from left to right, the elasticity estimates from the IV regression, the standard deviations of factor returns, the impact on factor prices per billion of factor flow, the standard deviations of factor flows, and the share of factor return variance explained by factor flow.

(b) **Carry Factor**



(c) **Euro-Yen Factor**

Can you provide context for the quantification exercises?

Questions

- I understand the need for "flattening" exposure, reducing forward to spot. But tenor is important, as shown by the literature relying on end-of-year effects. Are the results very different if you model "spot" vs some generalized "future" exposures?
- "Our traded FX factors have uncorrelated returns and flows, meaning that intermediaries and customers view these factors as uncorrelated." They are uncorrelated by construction, I am not sure how to conclude that intermediaries and clients view them as such.
- What is the Euro-Yen factor? Can it be micro-founded? Is it similar to the third PCA factor of just returns, or is this factor uniquely a traded one?
- ΔP_k for factors and ΔP_n for currencies are easily mistakable for each other. Also, it would be nice if notation in the empirical section matched that of the theory section ($\mathbf{r}$ vs r)
- LPSW24 consider hedge funds to be included in "Funds", while you do not. Some clarity would be necessary on that. If they are the same, good. If not, what is the bias in estimates?
- Why are CAD and USD in the EUR-JPY factor?
- I would show first-stage of IV regressions, signs will help understanding the mechanism

Conclusions

- A brilliant, thought provoking, very skillfully executed paper.

- I would love to learn more about:
  - Whether banks or dealers are the agent that matters.
  - The economic mechanism behind IV estimation.
    - Maybe evidence on holdings?
  - How to interpret the quantification exercises.

- This paper quantifies trading's effect on FX pricing, a demand-system for factors.

- Excited to see the next version!