Intermediary Balance Sheets and the Treasury Yield Curve

Discussion of Du, Hébert and Li (2023)

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The views expressed here do not necessarily reflect the position of the Bank of England.

Motivation and Interpretation

- Pre GFC: OIS swap rate minus Treasury-bond spread (swap spread) positive and Libor-based CIP deviations near zero, across maturities.
- Post GFC: Swap spread negative and Libor-based CIP deviations positive.
  - Fall in swap spread could be viewed as a fall in the convenience yield on U.S. Treasuries.
- Instead, authors argue that fall in swap spread, along with the positive CIP deviations, are a natural consequence of a post-GFC regime shift in Treasury market.
  - Expansion of Treasury supply: dealers–who fill residual demand/supply in Treasury market–move from being net-short to net-long Treasuries and swap spread switches sign.
  - Tighter balance sheet constraints: Dealers perform less arbitrage, which has quantitatively important effect on size of both spreads.

Outline of Paper and Key Findings

- Dealers maximize expected discounted return from 2 arbitrages — CIP and Treasury-Swap — subject to balance sheet constraint: $q^{syn} + |q^{bond}| \leq \overline{q}$. Assume $q^{syn} > 0$.
- From this, derive Treasury yield curve bounds for Dealers to be willing to be long or short Treasuries in swap-T arbitrage ($y^s_{n,t} \leq y_{n,t} \leq y^l_{n,t}$).
  - Implies bounds on swap spread $r_{n,t} - y_{n,t}$ that are tightly linked to CIP deviation $r^{CIP}_{n,t}$ since dealers indifferent at margin between two arbitrages.
  - Actual Treasury yields closely track dealer-short curves pre-GFC and dealer-long ones post-GFC!
- Embed model into realistic setting with Treasury supply and 2 types of clients who trade with dealers in Treasury and synthetic lending markets.
  - Rationalize patterns of CIP and swap spread Pre- and Post-GFC conditional on whether Dealer's are net-long/short Treasuries, which is determined by Treasury supply (and term premium), and a tightening of balance-sheet constraints of dealers.

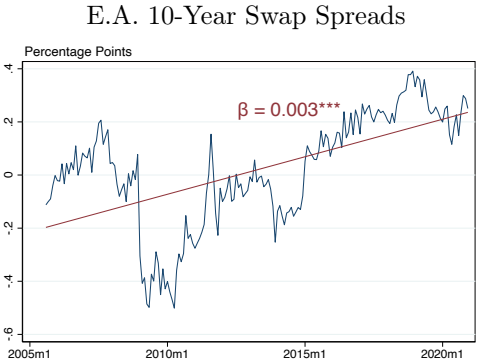
Balance-Sheet Costs or Risk Premia?

- Friction in model is limited balance-sheet space for arbitrage: $q^{syn} + |q^{bond}| \leq \overline{q}$.
  - Risk-based constraints price 70% of CIP deviations (Augustin et al. 2023).
  - CIP deviations increase before regulation (e.g., Basel III) kicks in.

$$r_{n,t} - y_{n,t} \geq r_{n,t} - y^l_{n,t} \simeq -\mathbb{E}^{\mathbb{Q}}_t \Big[\frac{1}{n} \sum_{j=0}^{n-1} r^{CIP}_{1,t+j} \Big] \simeq -r^{CIP}_{n,t}$$

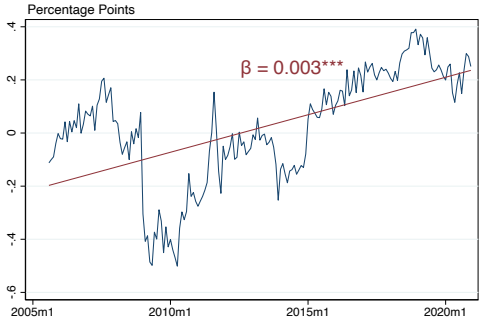
- In data, we know that $r^{CIP}_{n,t} > \frac{1}{n} \sum_{j=0}^{n-1} r^{CIP}_{1,t+j}$ since investors' require risk premium for rollover risk (Du, Hébert, Wang, 2022), which they show using "forward CIP trade"
- Is there a way to assess to what extent $r_{n,t} - y_{n,t} \simeq -r^{CIP}_{n,t}$ is due to balance sheet costs—which are emphasized in this paper—vs a risk premium for the risk that future balance sheet costs could rise.

How about Euro-Area (German) Swap Spreads?

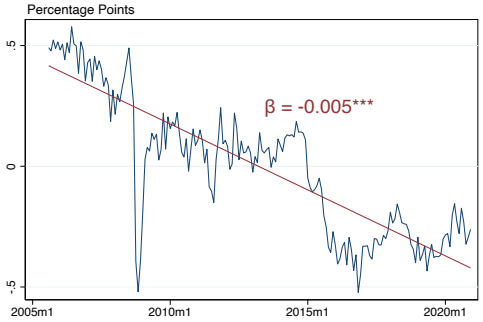


How about Euro-Area (German) Swap Spreads?

E.A. 10-Year Swap Spreads



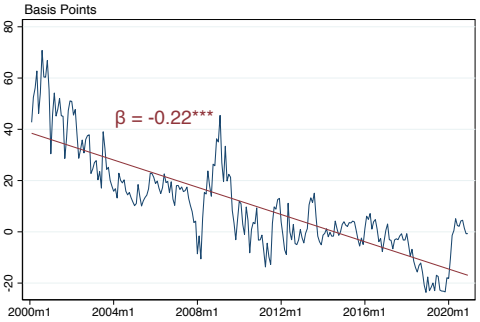
U.S. minus E.A. 10-Year Swap Spreads



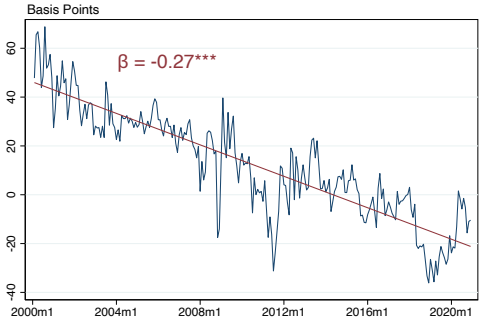
Note. from Corsetti, Lloyd, Marin, Ostry (mimeo), similar trends, but smaller, for 6-Month Spreads.

Decline in Long-Maturity U.S. Treasury CIP deviations

U.S. 10-Year Treasury Basis vs. G.7



U.S. 10-Year Treasury Basis vs. E.A.

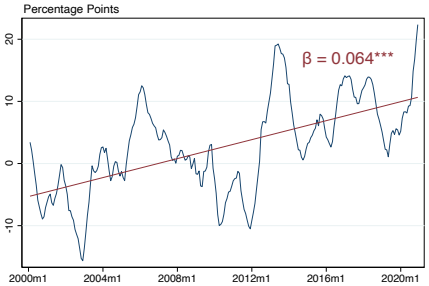


Note. from Corsetti, Lloyd, Marin, Ostry (mimeo) using data from Du, Im, Schreger (2018)

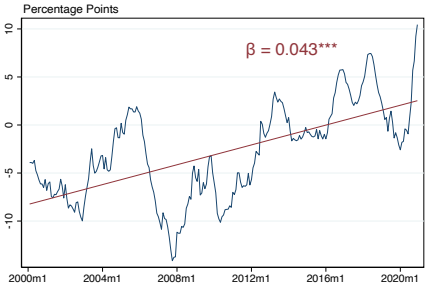
U.S. Long-Run Risk and the "End of Privilege"

$$\underbrace{\text{U.S. Relative Long-Run Risk}}_{\text{Relative Permanent SDF Volatility}} = \underbrace{\text{Long-Run USD Risk}}_{\text{Long-Run UIP Deviation}} - \underbrace{\text{Long-Run Treasury Convenience}}_{\text{Long-Run Treasury CIP Deviation}}$$

U.S. Long-Run Risk



U.S. Long-Run Risk vs. G.7 Average



Note. Long-Run Risk = Equity Prem. (Gordon model) - Term Prem. - CY, (Corsetti, Lloyd, Marin, Ostry (mimeo)) Generalized Alvarez and Jermann (2005) bounds; correlates w/ long-run risk of Schorfheide, Song, and Yaron (2018)

Conclusion

Really nice paper that connects arbitrage deviations across markets!