Intermediary Balance Sheets and the Treasury Yield Curve

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The views expressed in this presentation are those of the discussant and not necessarily those of the Federal Reserve Bank of New York or the Federal Reserve System.
Known Facts: (i) swap spread pos. to neg. and (ii) CIP zero to neg.
New Facts: (i) dealer net position neg. to pos. and (ii) CIP/swap spread correlation
1. Dealer-Long and Dealer-Short Curves
Balance-Sheet Neutral Treasury Trading Strategies

(A) Long Treasury

- Treasury Bonds
- Repo $r_{tri}$
- Dollar Lending in FX Swap $r_{syn}$
- Unsecured Funding $r_{ois}$

(B) Short Treasury

- Cash Collateral $r_{sec}$
- Treasury Bonds Borrowed
- Dollar Lending in FX Swap $r_{syn}$
- Unsecured Funding $r_{ois}$

Du, Hébert and Li (2022)
Net-Long vs. Net-Short Curve

- Long regime:
  \[ y^s \approx r^{syn} - r^{ois} + r^{tri}, \]
  or equivalently,
  \[ r^{ois} - y^s \approx - (r^{syn} - r^{ois}) + (r^{ois} - r^{tri}). \]

- Short regime:
  \[ y^s \approx -(r^{syn} - r^{ois}) + r^{sec}, \]
  or equivalently,
  \[ r^{ois} - y^s \approx r^{syn} - r^{ois} + (r^{ois} - r^{sec}). \]
10Y Yield pre- and post-GFC

- The actual bond yield switches from the dealer-short to the dealer-long curve, consistent with the change in dealers’ position.
2. Equilibrium Model
An Equilibrium Model

- Endogenous variables: (1) current $n$-period treasury bond yield $y$; (2) synthetic dollar lending rates $r^{\text{syn}}$. (3) Intermediary choices $q^{\text{bond}}$ and $q^{\text{syn}}$.

- Intermediaries (consolidated dealers and levered clients) optimize profit subject to constraint

$$|q^{\text{bond}}| + q^{\text{syn}} \leq \bar{q}$$

- Real-money investors (e.g., pension funds and mutual funds) demand

$$D^{\text{bond}}_U = D_U\left(ny - (n - 1)y_P - y^{\text{bill}}\right)$$

Exp. Dollar Return vs Bill

- FX-hedge foreign investors (e.g., foreign life insurance companies) demand

$$D^{\text{bond}}_H = D_H\left(ny - (n - 1)y_P - r^{\text{syn}}\right)$$

Exp. Dollar Hedged Excess Return

- Each unit of bond requires synthetic financing, so $D^{\text{syn}}_H = D^{\text{bond}}_H$. 
Market Clearings

▶ Treasury market:

\[
\exp(-ny)S^{\text{bond}} = q^{\text{bond}} + D_U^{\text{bond}} + D_H^{\text{bond}}
\]

Treasury bond supply in dollars

▶ Synthetic lending market:

\[
q^{\text{syn}} = D_H^{\text{bond}} + D^{\text{syn}}(r^{\text{syn}} - r^{\text{ois}})
\]

intermediary supply of syn lending

residual demand
Dealers’ Position Negatively Correlated with the Slope

- The model can explain that a steeper Treasury yield slope is correlated with stronger real-money demand for Treasury, which results in a lower dealer position, and a more negative swap spread.

- Contrasts with Jermann (2020) that the dealer inventory increases in the slope.
Key Changes Pre/Post GFC

- Supply of Treasury bonds has increased significantly, dealer balance sheets have contracted

Source: U.S. Flow of Funds
Regimes and Treasury Market Fragility

- Crises reduce dealer capacity \( \bar{q} \).
  - In the short regime (pre-2009) a bad shock to intermediary balance sheet decreases the Treasury yield relative to swaps.
  - In the long regime (post-2009) a bad shock to intermediary balance sheet increases the Treasury yield relative to swaps.

- An explanation of the Treasury market turmoil in March 2020 (Duffie (2020)).
  - Our explanation does not rely on “selling pressure” in the Treasury market (He, Nagel, and Song (2022)). Quantifying both forces is an interesting future direction.