

# DEMAND AND SUPPLY IMBALANCE RISK AND LONG TERM SWAP SPREADS

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# THE PAPER IN ONE SLIDE

## Motivating question

- What are the drivers of long term swaps spreads post GFC

## What the paper does

- Build pricing model of long term swap spreads with risk-averse intermediaries facing constraints
- Supply-side and demand-side shocks (plus shocks to cash-flows)
- SVAR representation, estimation of latent supply/demand factors
- Tests via predictive regressions

## Key take-aways

- supply and demand with approx. equal roles in explaining changes in swap spreads post-GFC
- narrative of different swap spread tightening and widening episodes
- framework that might be useful for other basis trades

## FRAMING OF THE PAPER

**Cynic view:** what's new here?

- Model: Vayanos & Vilas (2021) adding linear constraints
- Demand-side: Klingler & Sundaresan (2019)
- Supply-side: Jermann (2020), Boyarchenko & al (2018)
- Convergence risk: De Long & al (1990) and many others
- Swap spreads - dealer treasury position co-movement: Du & al (2022)

**My take:** we DO learn new things

- Emphasis:
  - this is NOT about pre- vs. post-GFC regime shift, but instead...
  - about explaining high(er)-frequency changes in swap spreads
- Model:
  - elegant, allows us to “look under the hood”
  - nice and sharp theoretical results re: existence and multiplicity
  - serious estimation of supply and demand factors

## POTENTIAL ISSUES WITH THEORY

**Linear equilibrium:** what could we be missing?

- Intermediary capital  $w_t$  into swap spread trade is hit by shocks, but...
- ... no feedback loop between intermediary P&L at time  $t$  and  $w_{t+1}$
- Rules out (potentially interesting) non-linearities and amplification
- Empirically open question: dealers tend to be in crowded trades, but...
- ... rates' desks potentially small compared to size of broker dealer

**Model vs. data:** this is about *long-term* swaps!

- Model: term structure of swap spreads – only driven by economic forces in long-end of the curve
- Data: dynamics of 30yr swap spreads de-linked from those of shorter maturities (Klingler & Sundaresan 2019)
- Data: in paper, main empirical specification uses dealer's *total* net UST positions

# INTERMEDIARIES HEDGING RECEIVE-FIXED DEMAND WITH USTs?

Table 6

## Value of interest rate swaps by sector

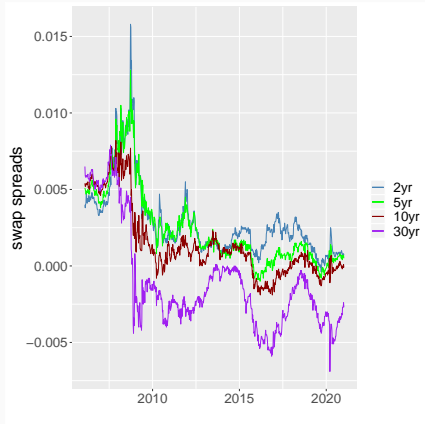
	No. of contracts	Gross notional (€ bn)	% pay-fixed	Net PV01 (€ m)	Gross PV01 (€ m)	Net/Gross PV01 (%)
G16 dealers	204,517	15,919	47.0	-21	11,528	-0.2
Banks	194,609	10,927	51.8	245	7,682	3.2
Insurers and pension funds	7,324	592	38.2	-344	860	-39.9
Other financials	39,749	2,631	51.9	-39	2,330	-1.7
Non-financials	7,209	188	83.2	73	141	51.7

Source: DTCC OTC interest rate swap dataset (based on the 02/11/15 trade state report plain-vanilla fixed-for-floating 6M Euribor IRSs).

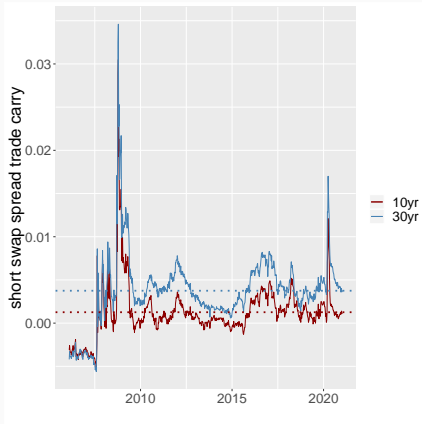
Note: "Other" includes governments, central banks, CCPs and counterparties with an unidentified sector.

**Figure 1:** Abad & al: Shedding Light on Dark Markets

# CARRY OF SHORT SWAPS SPREAD TRADE (MY CALCULATIONS)

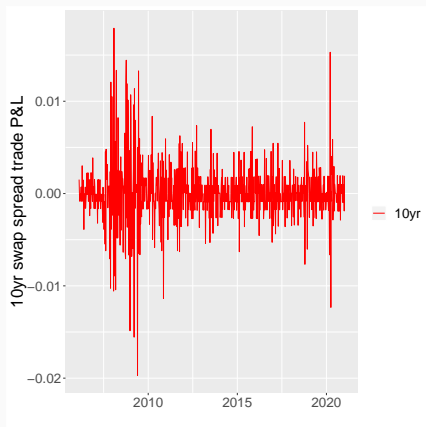


**Figure 2:** swap spreads

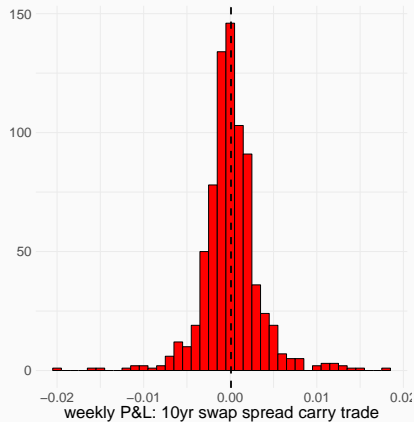


**Figure 3:** Libor – repo – swap spread

# 10YR SWAP SPREAD TRADE P&L (MY CALCULATIONS)

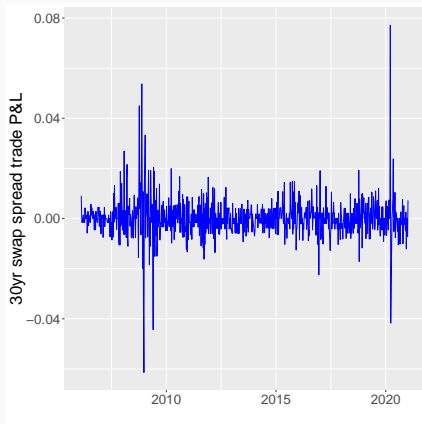


**Figure 4:** weekly P&L time series

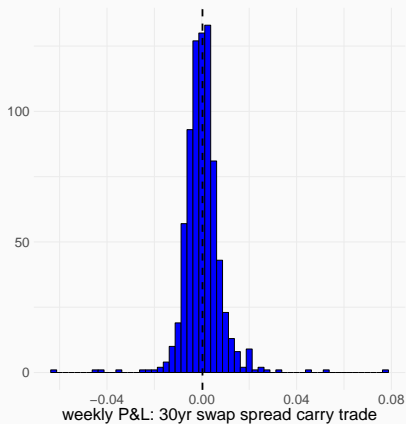


**Figure 5:** weekly P&L time distribution

# 30YR SWAP SPREAD TRADE P&L (MY CALCULATIONS)



**Figure 6:** weekly P&L time series



**Figure 7:** weekly P&L time distribution



## P&L STATISTICS (SINCE FEB 2006) (MY CALCULATIONS)

Trade	10yr	30yr
avg carry (bps p.a.)	13	38
st. dev weekly P&L (bps)	33	81
5% VaR weekly P&L (bps)	-45	-94
1% VaR weekly P&L (bps)	-94	-176
Max drawdown (bps)	-197	-614

### Capital requirement?

- SLR most likely binding for large dealer-banks
- balance-sheet impact:
  - treasury bond (on b/s)
  - repo haircut (unsecured) funding (on b/s)
  - swap IM (unsecured) funding (on b/s)
  - swap PFE (off b/s)
- reg cap SLR for GSIBs:  $\approx 6.0\% \Rightarrow$  max leverage  $\approx 15x$

### Are dealers-banks really engaged in such trade?

### NY Fed primary dealer statistics: dealers' net UST position

- pre-GFC: largely negative; post-GFC: largely positive
- story 1 (this paper): dealers (and HFs) short long-term swap spreads
- story 2 (my first guess):
  - all primary dealers affiliated with a GSIB
  - required increase in HQLA on banks' balance-sheet given LCR regs
  - internal liquidity requirements at all bank-affiliated entities
- story 3 (my second guess):
  - post-crisis, increased collateral posting requirements on derivatives
  - IM at CCPs: dealers post "cheapest" collateral – in many cases, USTs

### Dealers' asset swap spread position:

- Dealer net UST position related to asset swap spread risk? Maybe...
- ... but need data on all IR derivatives – in particular, UST *futures*

# CONCLUSION

- **The good stuff**
  - Elegant model with SVAR representation and many “predictions”
  - Consider together demand *and* supply effects
  - Estimate these demand/supply factors + relate them to empirical proxys
- **The stuff that might be improved**
  - Contribution / framing
    - this is about *post-GFC, high(er)-frequency* 30yr swap spreads changes
  - Currently: model of long-term swap spreads only
    - Stick to this, but then consider data that is consistent with that model
    - Expand to include demand shifters at shorter end of term structure (as in Vayanos & Vilas (2021)), and generalize the intermediary constraint
  - Data:
    - For now, common issue in the entire literature on swap spreads
    - Currently, only publicly available data that is very *noisy*
    - Get NY Fed co-author and drill down into dealer asset swap spread risk