

Assessing fixed income market liquidity

Presentation to TBAC

July 2013

Committee Charge #2: Fixed Income Market Liquidity

Since the 2008 financial crisis, there have been a number of developments in financial markets, such as new regulations, changes in market structure, and technological advancements.

To varying degrees, these developments have had an impact on the landscape and structure of the global financial marketplace. We would like the Committee to comment on the extent to which these changes could impact liquidity in fixed-income markets.

What is the outlook for fixed-income liquidity over the longer-term?

Executive summary

- Market turnover has if anything increased since the financial crisis
- But liquidity is about much more than turnover
 - Tendency to disappear abruptly when really needed
- Primary liquidity not really a problem; major issues all in secondary
- Neither turnover nor the street have been able to keep pace with the massive expansion in markets
- Regulations have created multiple constraints likely to curtail liquidity when it is really needed:
 - Most have pushed liquidity towards Treasuries, reducing it in risky assets:
 - Basel risk-weightings, swaps clearing, LCR requirements
 - Now, supplementary leverage ratios risk curtailing it even in Treasuries: dealers likely to meet requirements by reducing assets rather than raising capital
- Effects of regulations to date have been offset by Fed policy pushing investors in the opposite direction:
 - Significant demand for fixed income assets in general, and risky assets in particular
- Technology and shifts in market structure have added to the *appearance* of liquidity, but done little to add depth
- Potential for significant dislocation when investor flows reverse

Agenda

Trends in fixed income liquidity

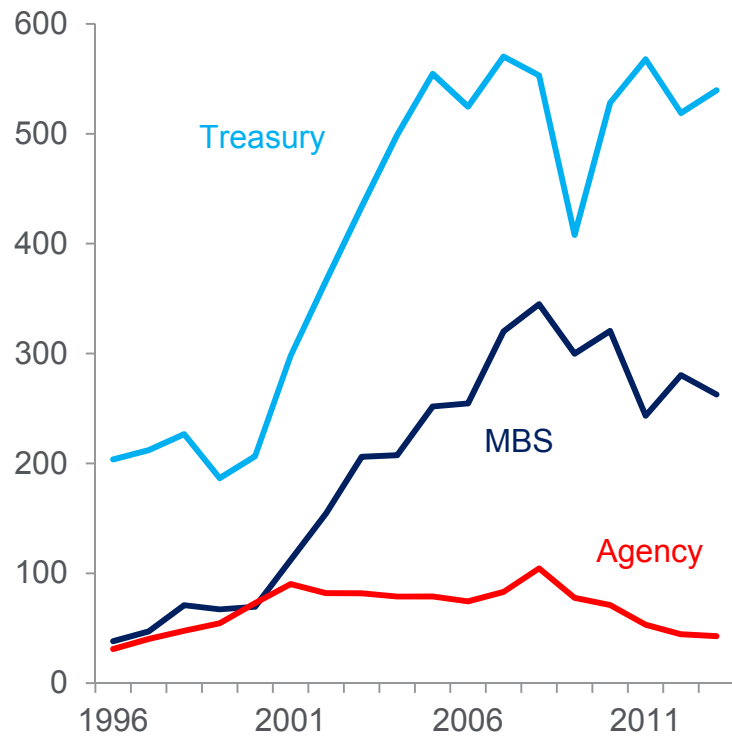
Effects of new regulations

Effects of policy and market structure

Simple market turnover

Turnover in Treasuries & Agencies

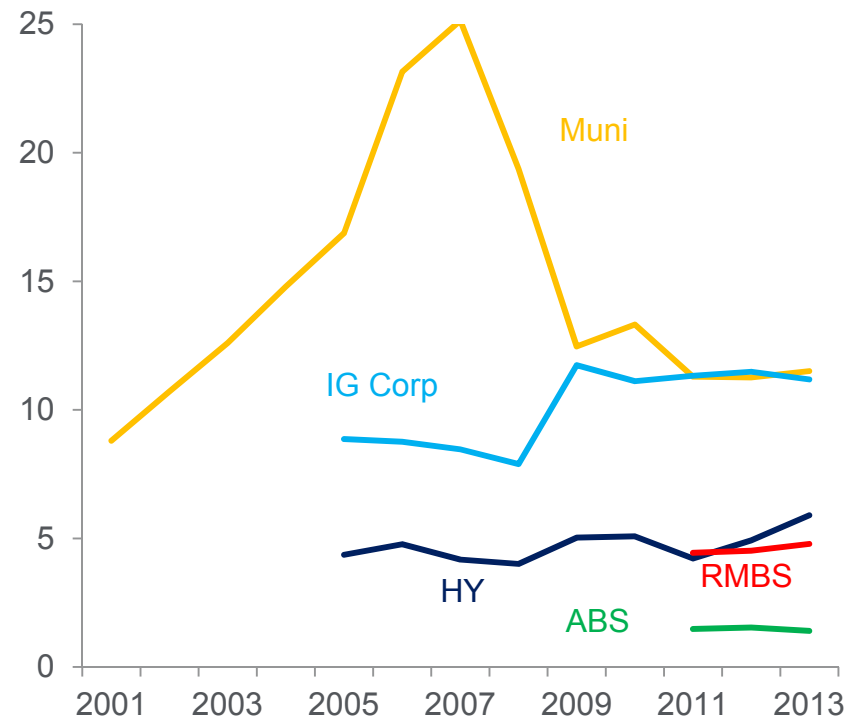
Average daily traded volumes (\$bn)



Source: SIFMA. Agency and MBS data uses primary dealer transactions. TRACE-reported volumes are much lower.

Turnover in credit

US traded volumes in credit (\$bn, daily)



Source: SIFMA, FINRA TRACE, Haver Analytics.

Dollar turnover suggests no great drop since 07

But what do we mean by liquidity?

The four dimensions of liquidity

- **Tightness:** difference between bid and offer
- **Depth:** size of transaction that can be absorbed without affecting prices
- **Immediacy:** speed with which orders can be executed
- **Resiliency:** ease with which prices return to “normal”

Source: Borio, C., Market liquidity and stress: selected issues and policy implications, BIS (2000)

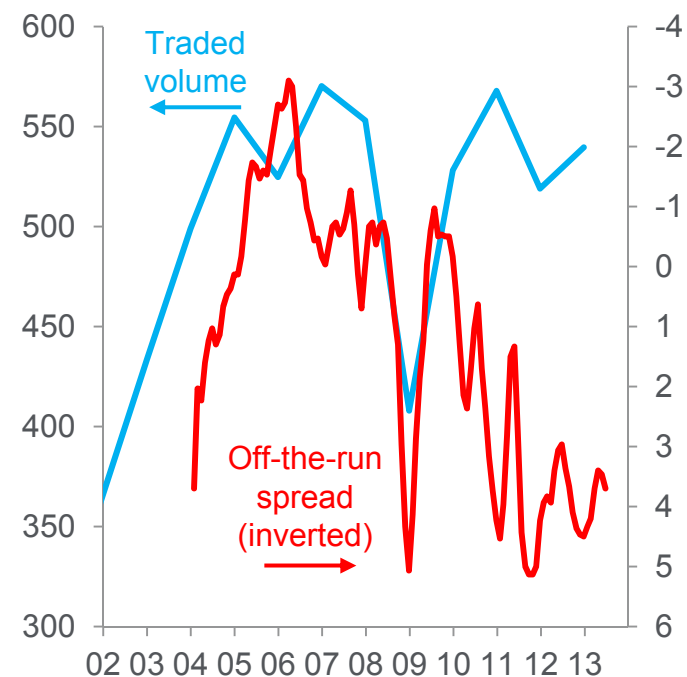
Ingredients for a liquid market

- Competitive market structure
- Low fragmentation
- Minimization of transaction costs
- Heterogeneity of market participants
- Sound infrastructure

Source: BIS Committee on the Global Financial System, *CGFS issues recommendations for the design of liquid markets*, BIS (1999).

Volumes up; liquidity not

10y UST off-the-run on-the run premium, bp vs average daily traded Treasury volume, \$bn



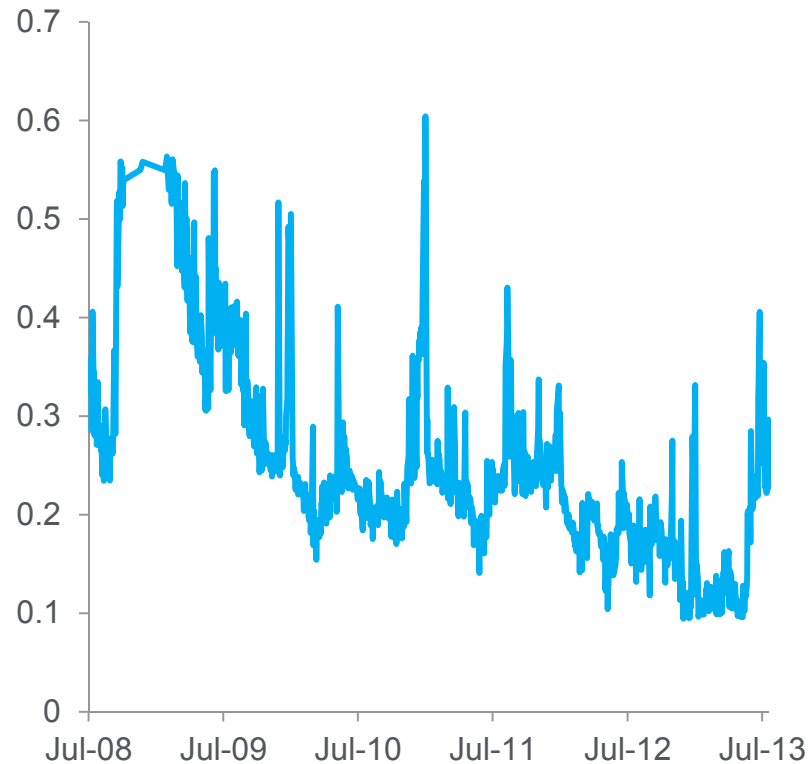
Source: Haver Analytics.

Liquidity has many facets

Bid-offer tends to be spiky

Trend improving, spikes not

Cost to trade 2k TY futures, yield bp



Source: Bloomberg.

Prone to sudden spikes

Modelled* bid-offer in credit, 15-day rolling, median, bp



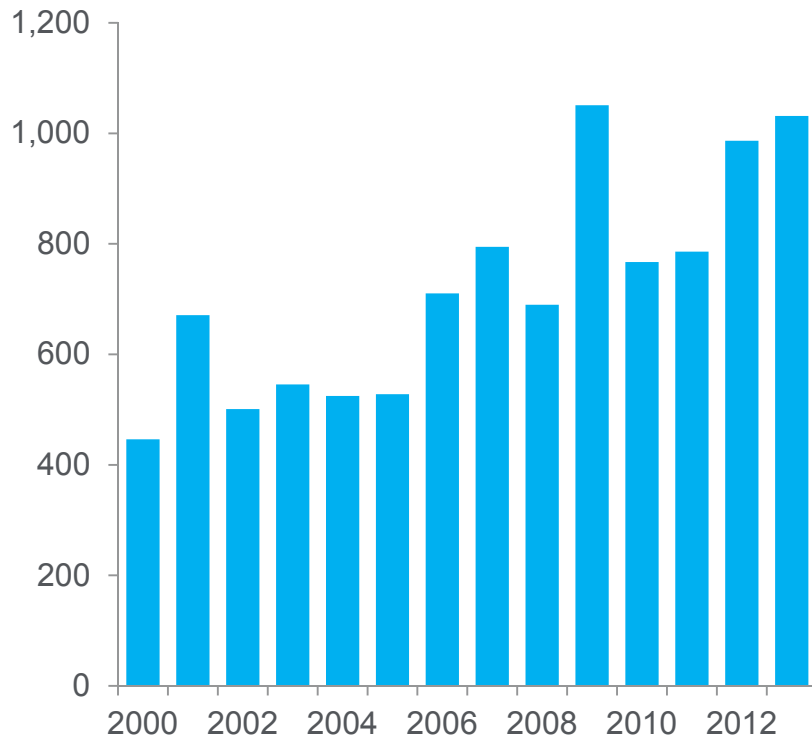
Source: Bloomberg. See "A Simple Implicit Measure of the Effective Bid-Ask Spread", R. Roll, *Journal of Finance* (1984).

Liquidity typically fine – until you actually need it

Assessing liquidity in primary

Record volumes in primary...

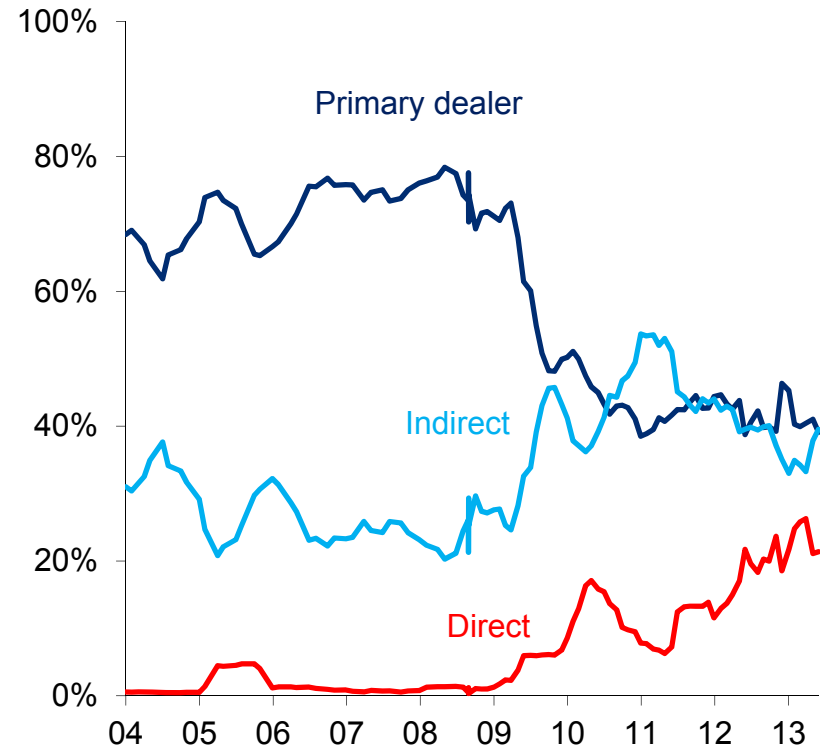
Gross new issuance of \$ corporates (fin+nonfin, fixed + floating), \$bn



Source: Dealogic. 2013 data are annualized from first seven months.

... though direct participation may lead to secondary "opacity"

Treasury auction participation, %



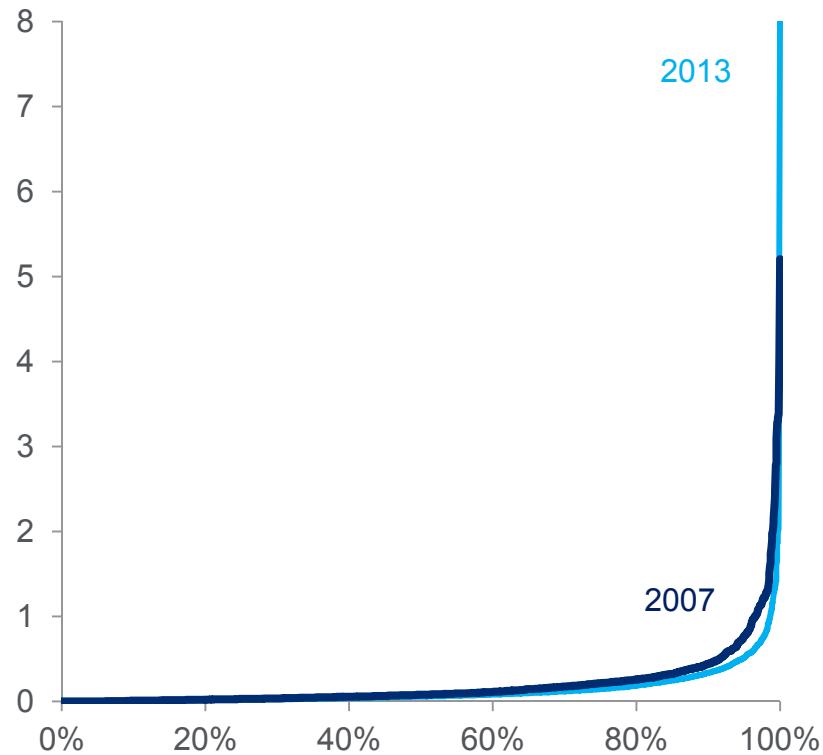
Source: NY Fed.

Primary markets are generally not a problem

Assessing liquidity in secondary

Corp turnover concentrated in very few bonds

Corp bonds ranked by annual traded volume in block trades, \$bn



Source: TRACE.

Post-crisis, balance sheet costs more

Asset swap spread of TIP Jan25, bp



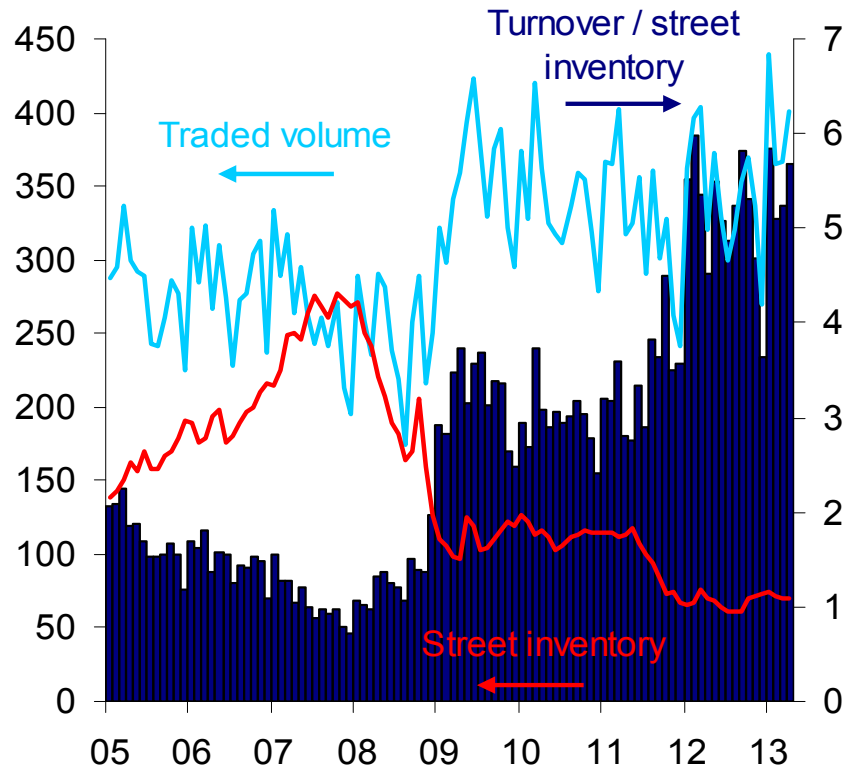
Source: TRACE.

Secondary trading requires risk warehouses

Accounting for the growth in the market

The street has become more efficient...

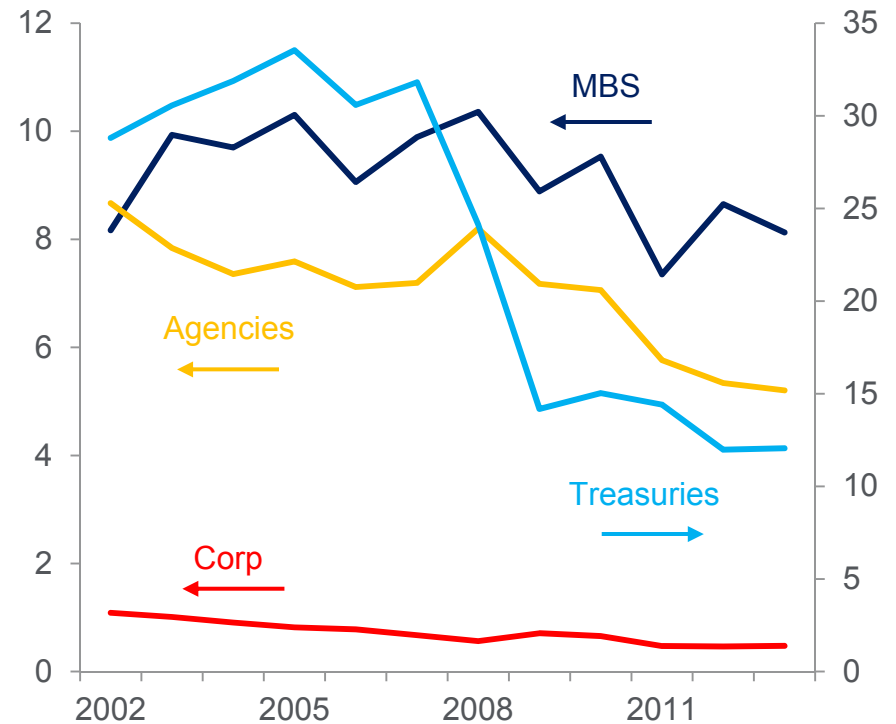
US traded volumes (IG+HY, \$bn) vs inventory (\$bn) and ratio



Source: FINRA TRACE, Haver Analytics.

...but has not kept pace with outstandings

Turnover, multiple of outstandings, annual, times



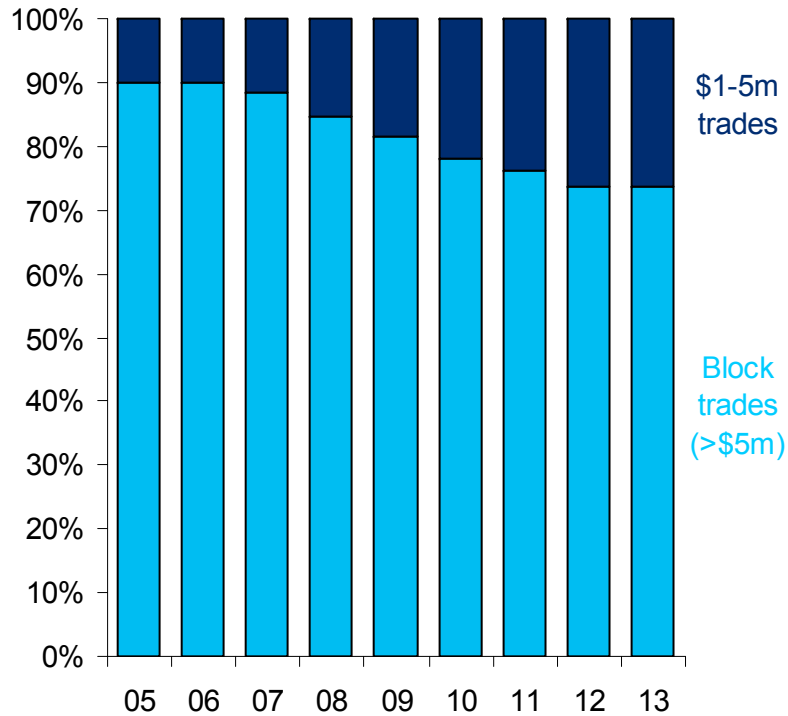
Source: SIFMA, TRACE.

Markets have grown rapidly;
neither turnover nor the street has kept up

How are investors responding?

Fewer large trades...

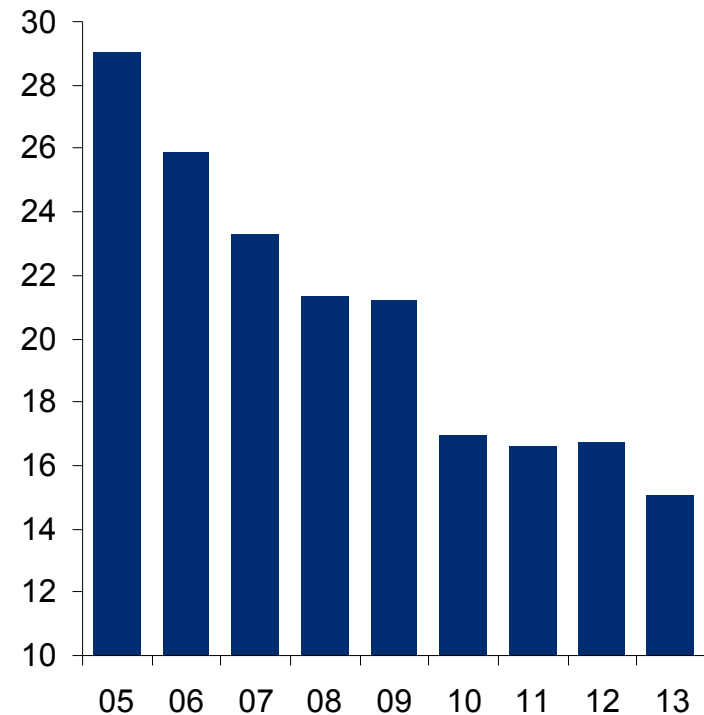
Block trade volume as % total traded volume, US



Source:FINRA TRACE.

...and even those are smaller

Average block trade size, US IG, \$m



Source:FINRA TRACE.

Making trades smaller – or not trading at all

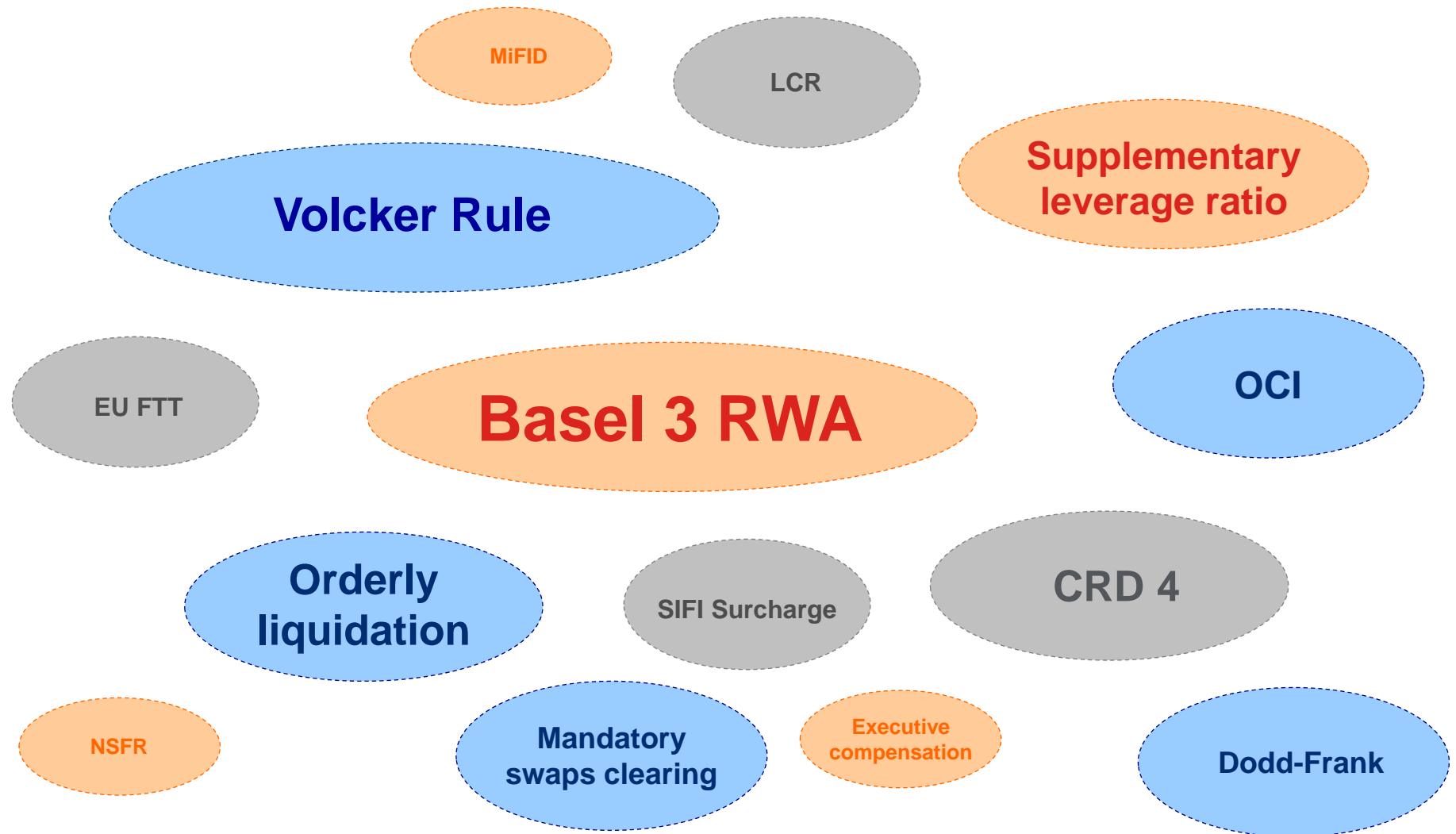
Agenda

Trends in fixed income liquidity

Effects of new regulations

Effects of policy and market structure

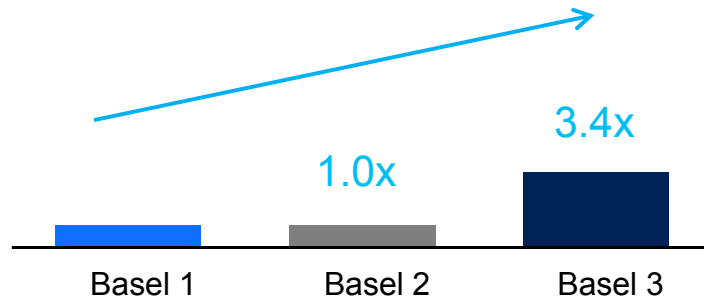
A tighter regulatory framework



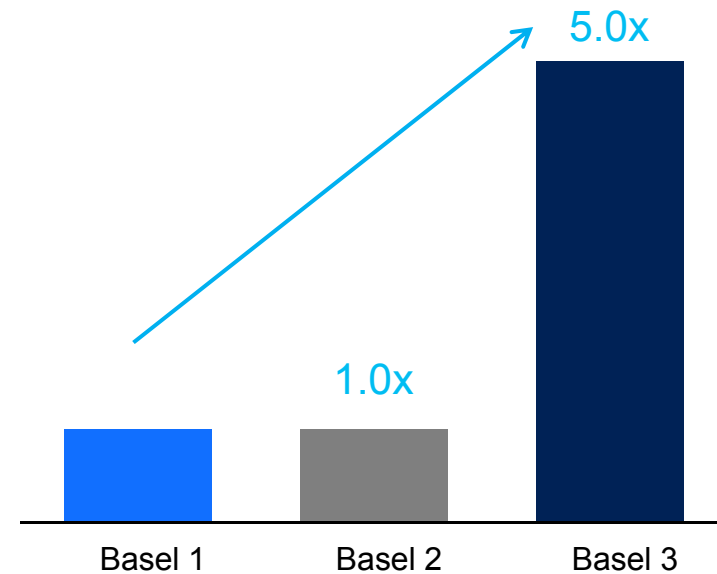
Reduced risk – but also reduced liquidity

Capital cost under Basel 3

3x cost for investment grade
Risk-weighted asset charges (\$m)



5x cost for high yield
Risk-weighted asset charges (\$m)



Bond Description

Average Tenor	2-3 years
IG Ratings	Average of AAA, AA, A, BBB
HY Ratings	Average of BB, B, CCC

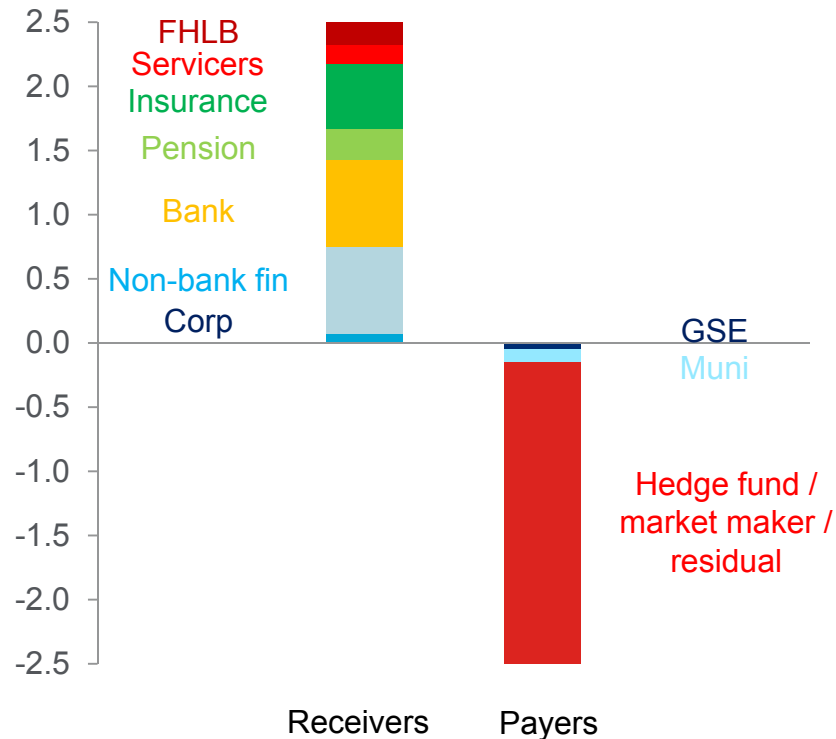
Note: Capital Impact from Basel 1 to Basel 3 is based on single bonds and does not take into account portfolio diversification effects

3-5x increase in charges for corporate bonds

Swaps clearing

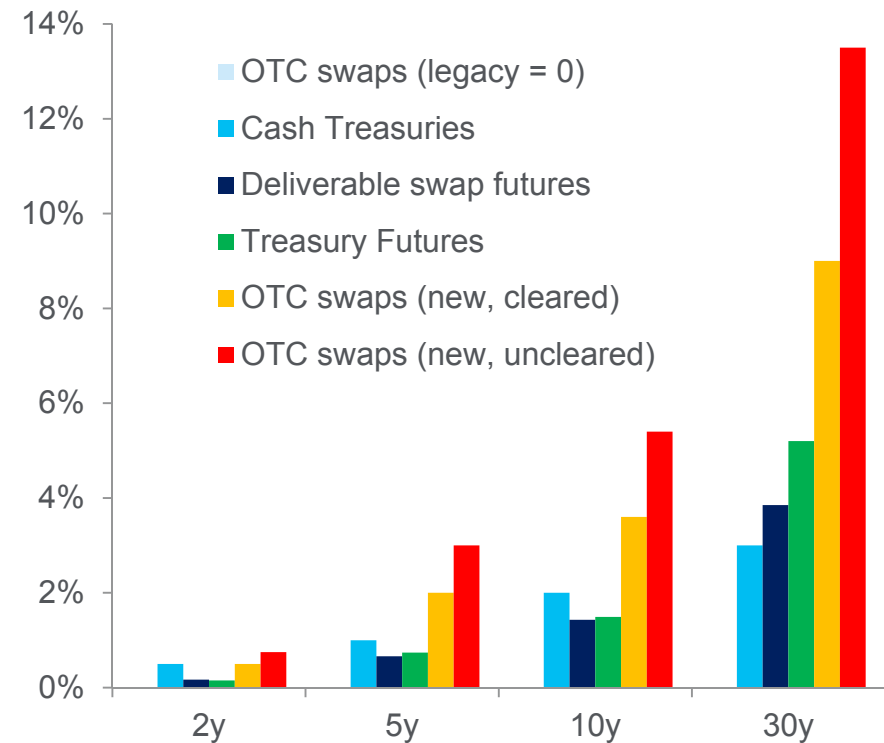
A market out of balance...

Imbalance between OTC swaps payers and receivers, \$bn DV01



...even before margins were hiked

Initial margin requirements (% notional)*



Source: Dealer estimates.

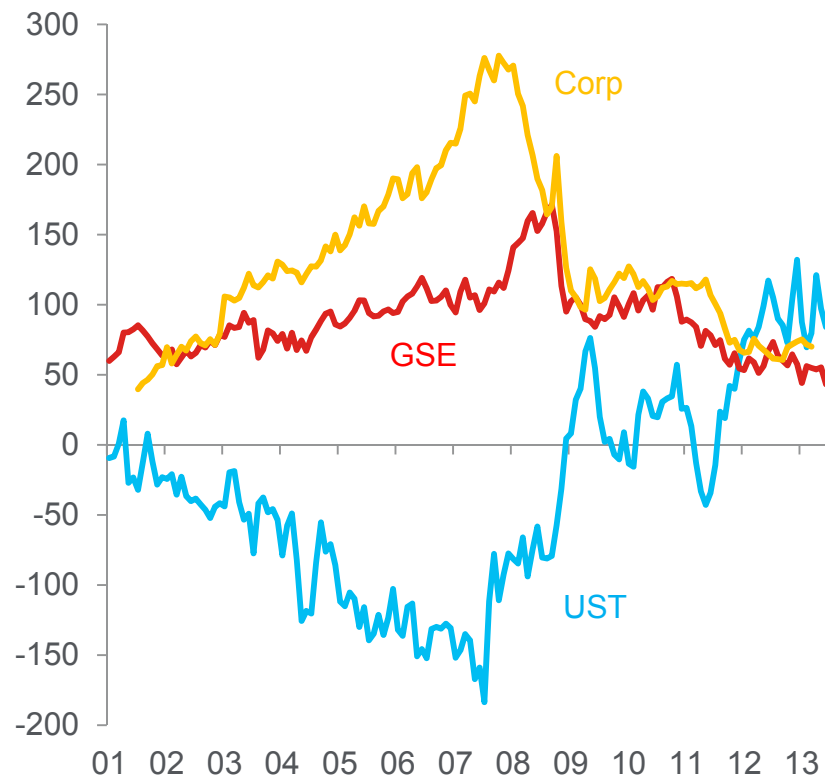
Source: CFTC. * Calculated from current VaR levels.

Activity migrating from swaps towards futures

Higher balance sheet charges have affected:

What the street holds

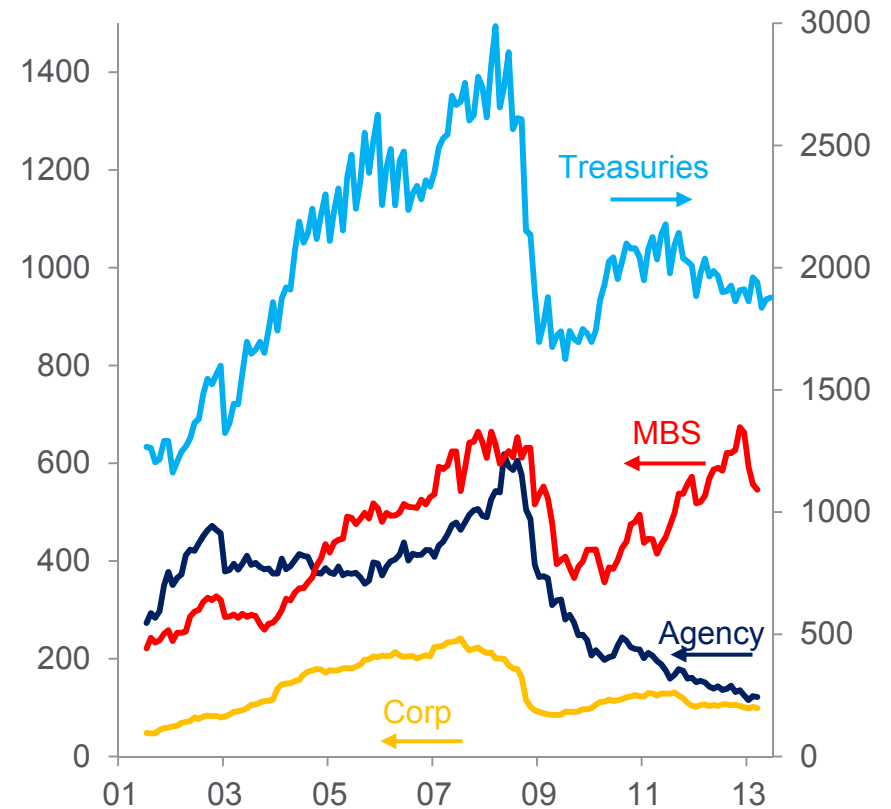
Primary dealer positions by asset class, \$bn



Source: NY Fed, Haver Analytics.

What the street is willing to finance

Primary dealer financing (reverse repo) by asset class, \$bn



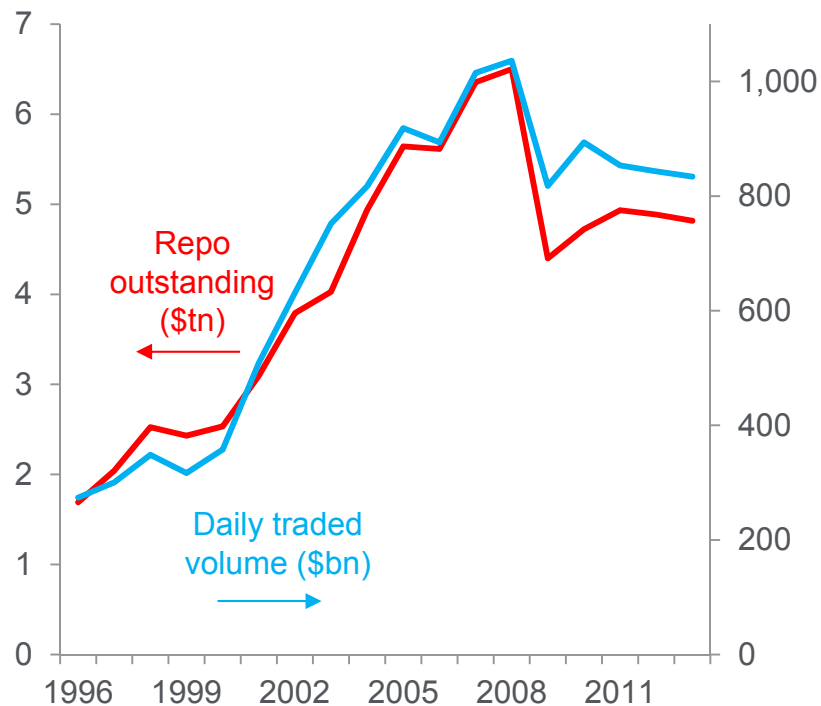
Source: NY Fed, Haver Analytics.

Dealers can no longer afford to act as credit warehouses

Supplementary leverage ratios

The silently beating heart of the market

Primary dealer total financing (\$tn) vs
total daily traded volume across US fixed income (\$bn)



Source: SIFMA. Dealer financing = repo + reverse repo.

- Key leveraged players in fixed-income markets consume dealer balance sheet via repo
 - Relative value players police the Treasury yield curve
 - REITs, hedge funds police the MBS basis
- Supplementary leverage ratios could significantly reduce dealer repo activity (low margin, balance sheet intensive)
- Would increase yield curve and agency MBS basis volatility


Leverage ratios will leave dealers less willing to provide repo financing and to hold USTs

How much might leverage ratios cost?


Cut assets, or raise more capital?

Changes in leverage ratio (bp) produced by shifts in balance sheet (\$bn) and capital (\$bn)

Change in balance sheet assets (\$bn)



Change in capital (\$bn)



	-50	-40	-30	-20	-10	0	10	20	30	40	50	100	150	200	250
0	11	6	6	4	2	0	-2	-4	-6	-8	-10	-20	-29	-38	-47
0.5	13	8	8	6	4	2	0	-2	-4	-6	-8	-18	-27	-36	-45
1	15	10	10	8	6	4	2	0	-2	-4	-6	-16	-25	-35	-43
1.5	17	13	13	10	8	6	4	2	0	-2	-4	-14	-23	-33	-41
2	19	15	15	13	10	8	6	4	2	0	-2	-12	-22	-31	-40
2.5	21	17	17	15	12	10	8	6	4	2	0	-10	-20	-29	-38
3	23	19	19	17	15	12	10	8	6	4	2	-8	-18	-27	-36
3.5	25	21	21	19	17	14	12	10	8	6	4	-6	-16	-25	-34
4	28	23	23	21	19	17	14	12	10	8	6	-4	-14	-23	-32
4.5	30	25	25	23	21	19	16	14	12	10	8	-2	-12	-21	-30
5	32	27	27	25	23	21	19	16	14	12	10	0	-10	-19	-28
10	53	48	48	46	44	41	39	37	35	33	30	20	10	0	-10
15	74	69	69	67	64	62	60	57	55	53	51	40	29	19	9
20	95	90	90	88	85	83	80	78	76	73	71	60	49	38	28

10bp higher ratio can be offset by \$2.5bn in capital,
or by shedding \$50bn in assets

OCI changes

- Large banks must now reflect mark-to-market gains/losses in tier-1 capital
- Recent 100 bp sell-off in Treasury market dented tier-1 capital by ~\$40 bn
- Worsened tier-1 capital ratio by ~0.3%

And that was only the first 100bp

Net unrealized gains (losses) on available-for-sale securities, domestic commercial banks, \$bn



Source: Federal Reserve H.8.

Will reduce banks' role as stabilizer in agency MBS

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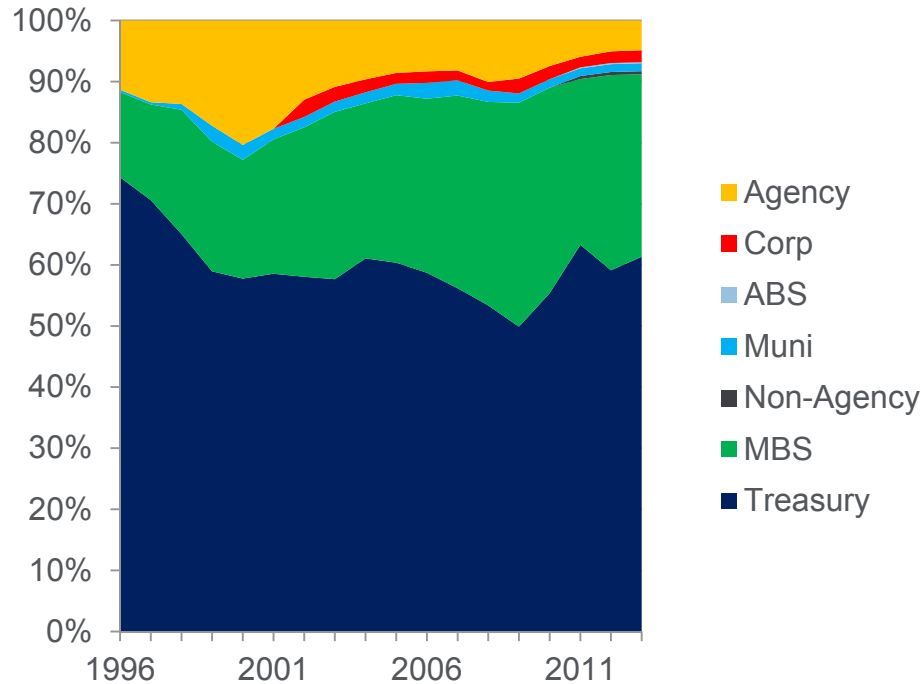
Effects of new regulations

Effects of policy and market structure

Regulations and monetary policy in conflict

Liquidity moving towards Treasuries...

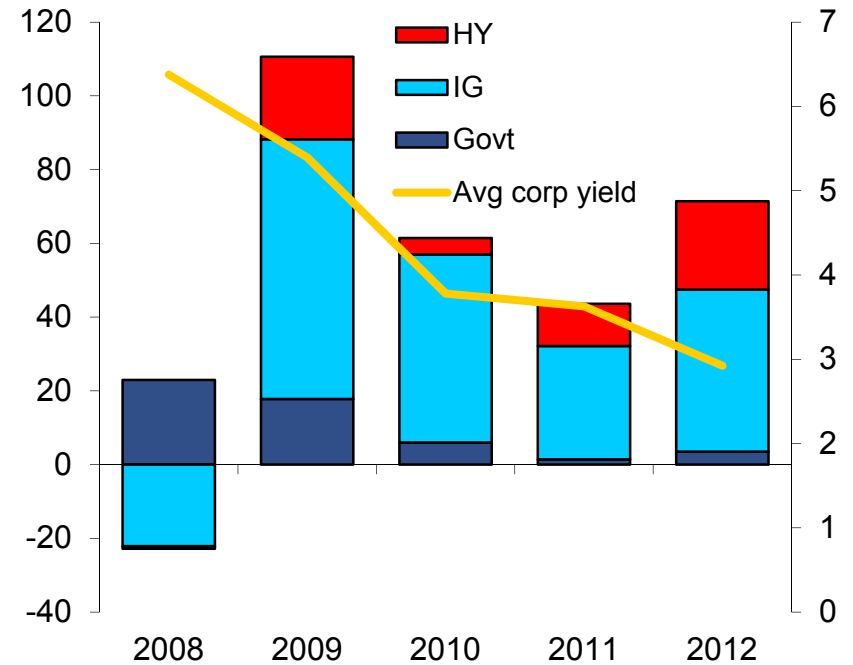
Distribution of daily market turnover, %



Source: SIFMA.

Investors moving away from them

Net mutual fund sales, \$bn



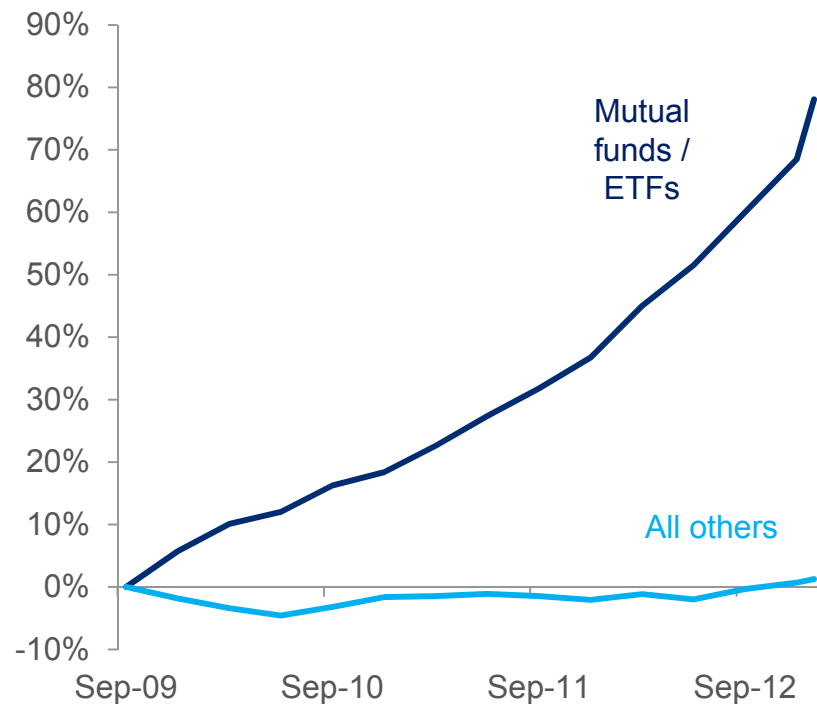
Source: ICI, Haver Analytics.

Regulations moving one way; investors moving the other

Credit awash with inflows

Tourist influx?

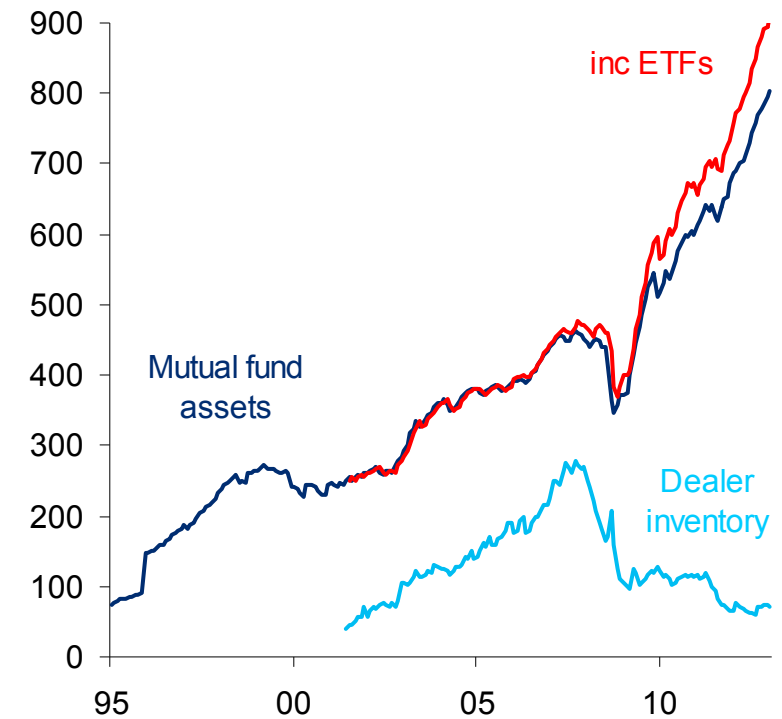
Percentage growth in credit holdings since Sep09



Source: Federal Reserve, Haver Analytics.

Entrance with no exit?

US credit mutual fund assets vs dealer inventory (\$bn, IG+HY)



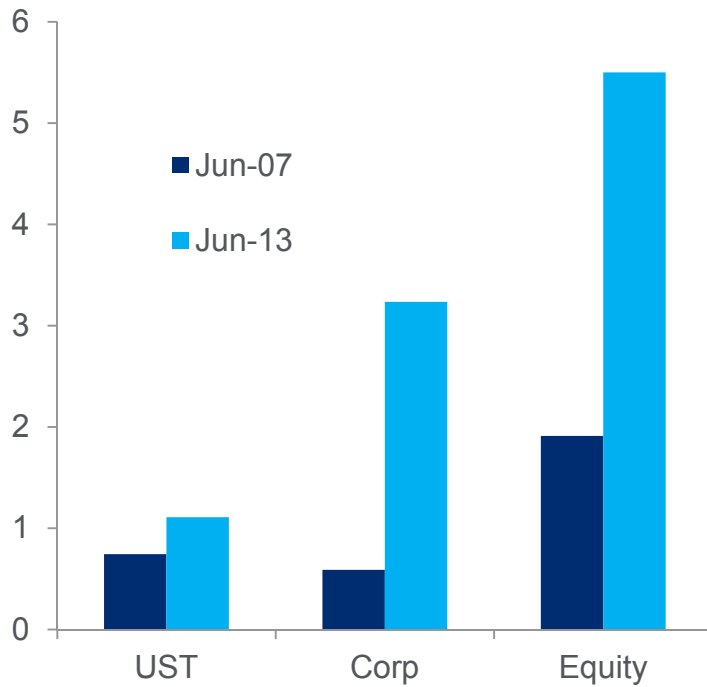
Source: ICI, NY Fed, Bloomberg, Haver Analytics.

Liquidity likely to prove a problem on the way out

ETFs

Small, but growing fast...

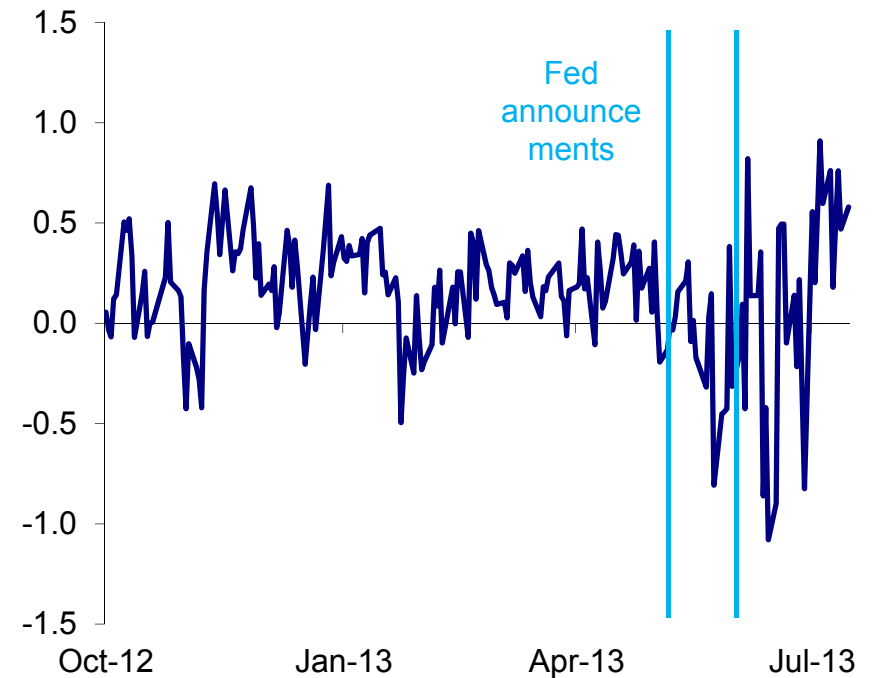
ETF outstandings vs underlying mkt size, %



Source: ICI, Haver Analytics.

...and vulnerable to any rush for the exit

US HY JNK ETF discount to net asset value, %



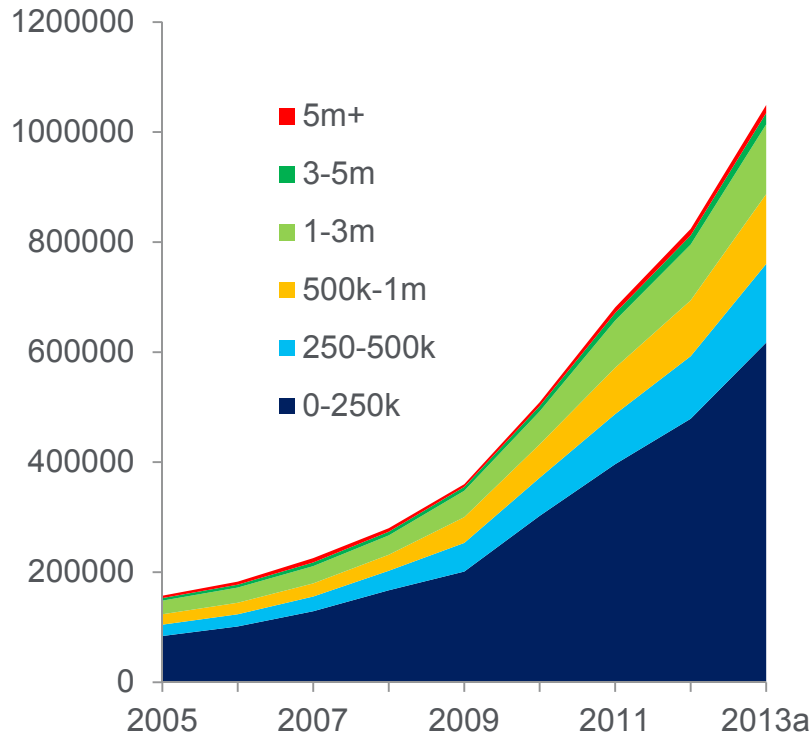
Source: Bloomberg.

Still small, but symptomatic of a broader issue

E-trading: phantom liquidity personified

Massive growth in electronic inquiry...

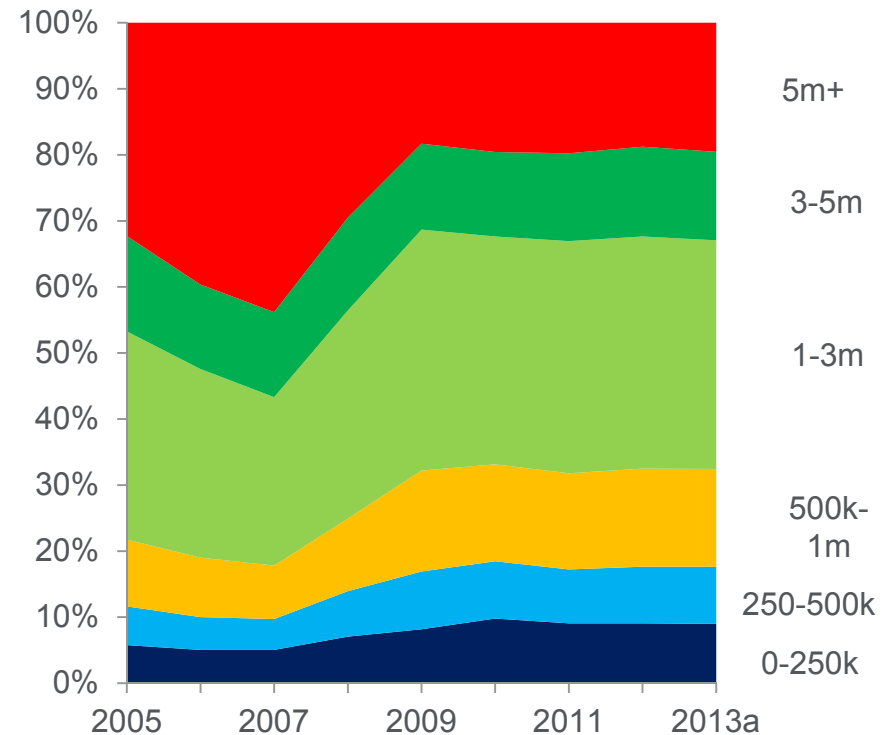
Number* of price inquiries on Market Axess by size, IG Corp, annual



Source: Market Axess. 2013 data is annualized from 1H.
* Uses single dealer data thought to be representative of broad market.

...shame so much is in small sizes

\$ volume of Market Axess inquiries by size*, IG Corp, \$bn



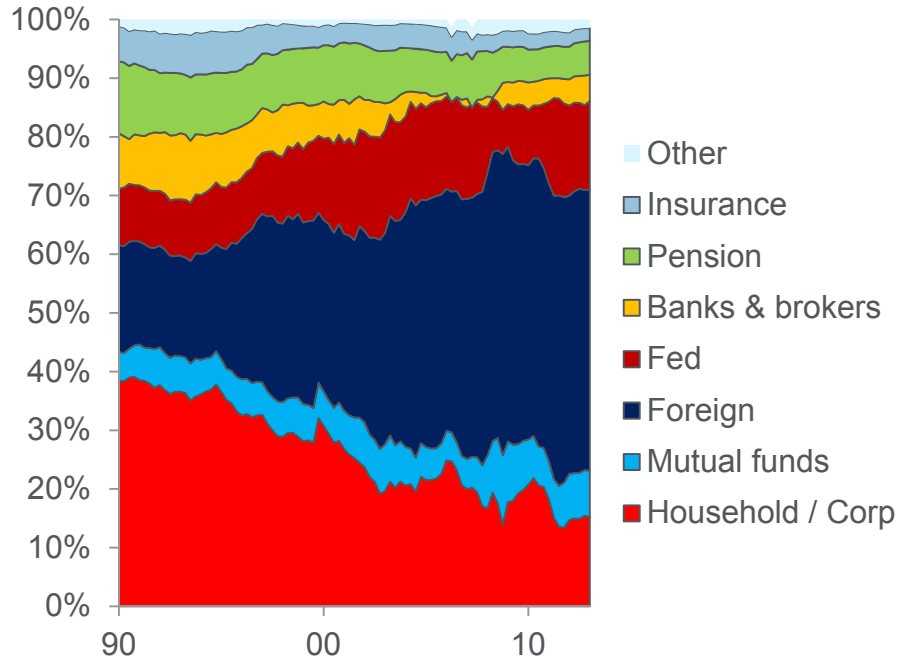
Source: Market Axess.
* Uses single dealer data thought to be representative of broad market.

Much volume, little depth

Shifts in market structure

Dominated by the Fed and foreigners

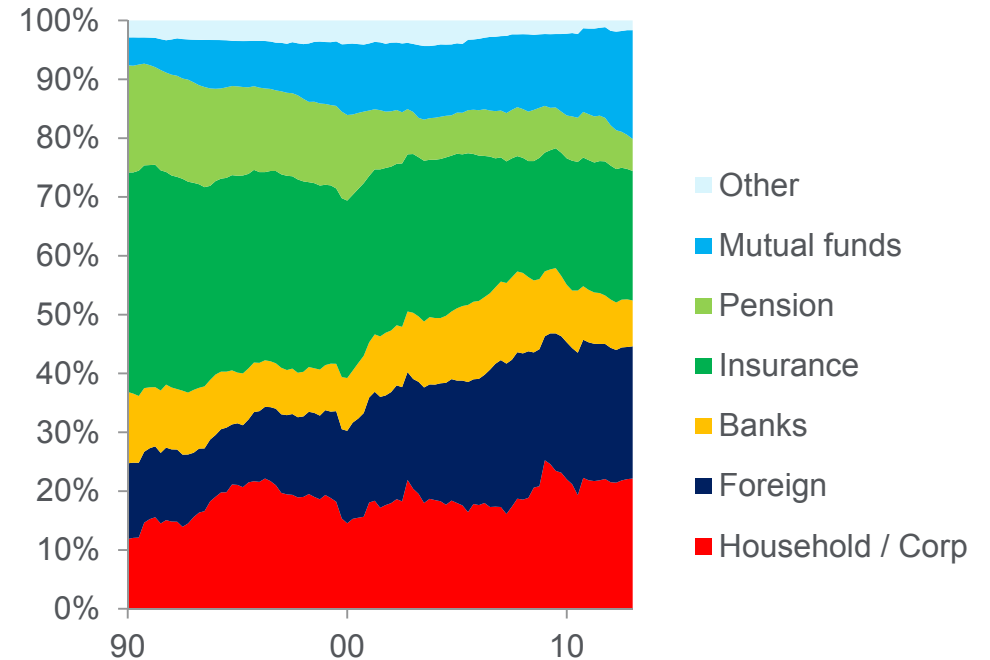
Holders of US Treasuries, % outstandings



Source: Federal Reserve Flow of Funds, Haver Analytics.

Total return investors on the rise

Holders of US Corporate bonds, % outstandings



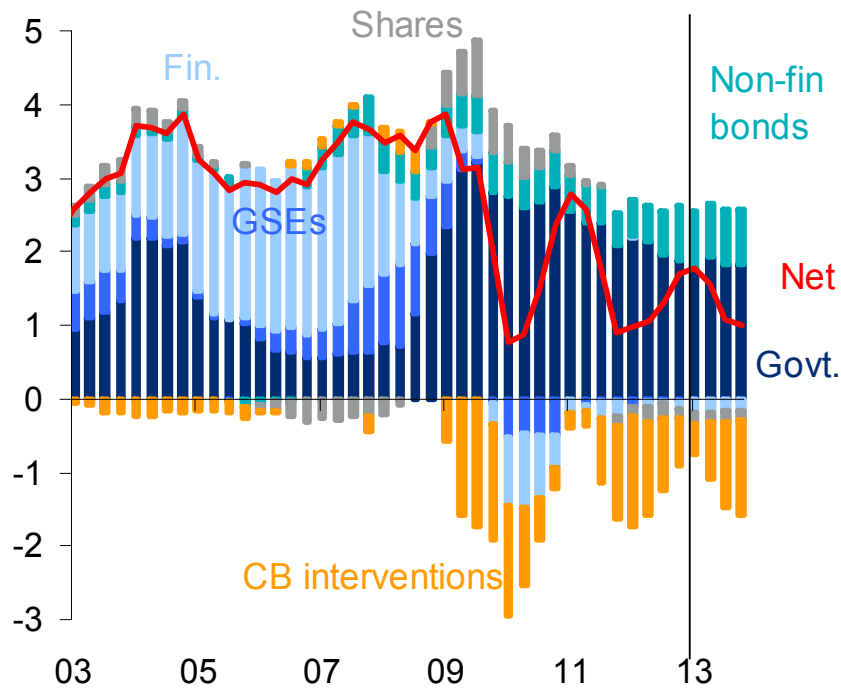
Source: Federal Reserve Flow of Funds, Haver Analytics.

Reduced heterogeneity

The impact of monetary policy (1)

Net issuance down from \$4tn to \$1tn

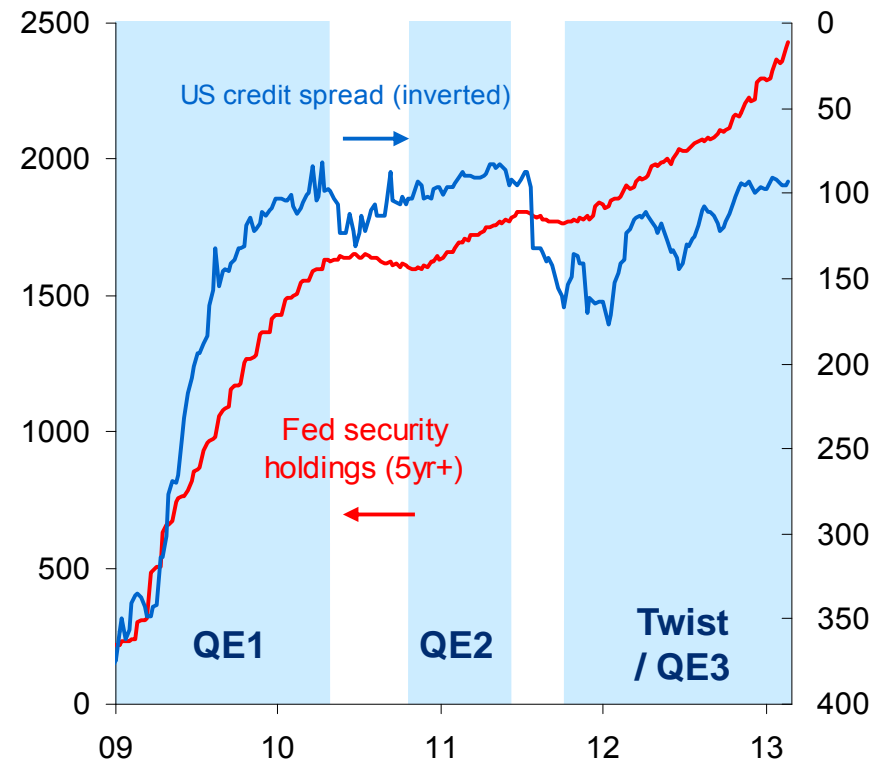
Net iss. of new securities minus central bank* interventions, 12m rolling, \$tn



Source: Haver Analytics. *: Federal Reserve, BoJ & ECB

No one dares fight the Fed

US BIG Corporate spread (bp) vs Fed security holdings (\$bn)



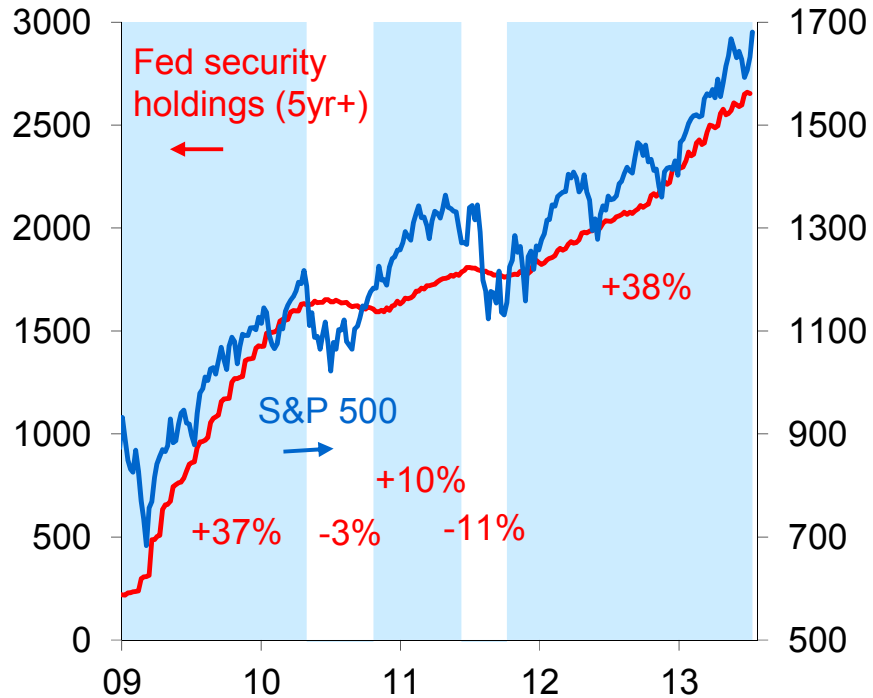
Source: Federal Reserve.

Not just increased demand – also reduced supply

The impact of monetary policy (2)

It also works in equities

S&P 500 vs Fed security holdings (\$bn)



Source: Haver Analytics.

It even works week by week

Weekly Fed purchases vs associated market move in credit and equities, Jan09-Apr13

Fed buying (\$bn)	S&P Chg pts	Chg %	US BIG Chg bp	# Weeks Count
>5bn	570	54%	-401	159
<5bn	141	15%	55	62
<0	-51	-2%	36	29

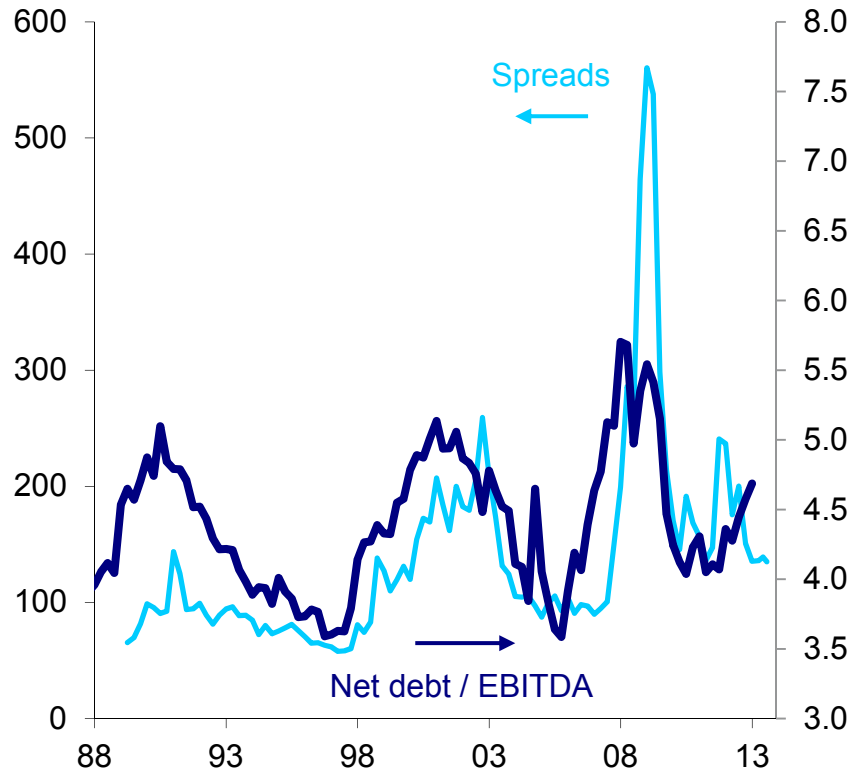
Source: Bloomberg, Haver Analytics.

Investors just following the Fed

Beware the potential for reversal

No longer following fundamentals

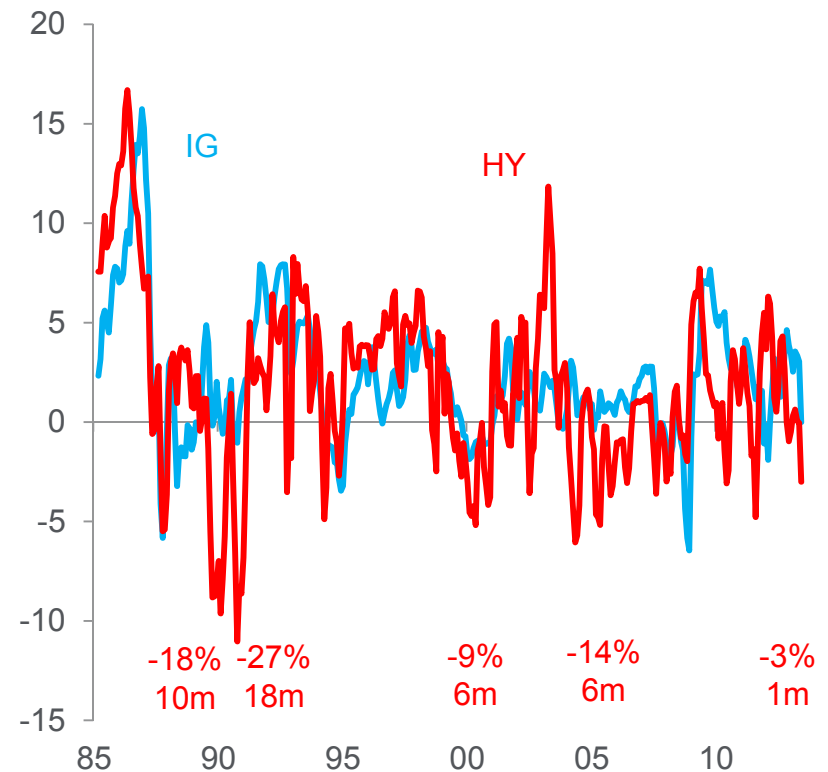
US IG credit spreads (bp) vs nonfin corp leverage (times)



Source: Federal Reserve Flow of Funds, Bloomberg.

June will happen again, and worse

Net flow into US credit mutual funds, % outstandings, 3m sum

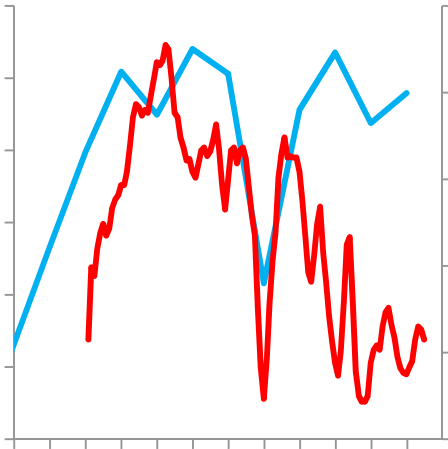


Source: ICI, Haver Analytics.

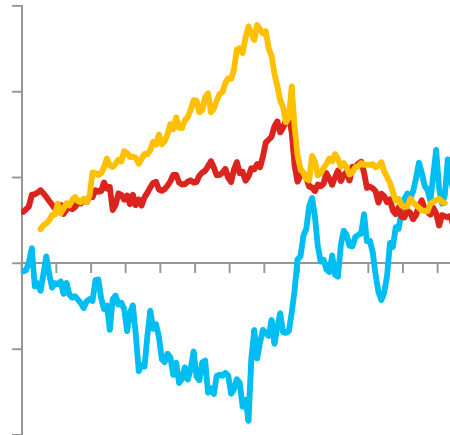
Potential for sudden dislocations

Conclusion

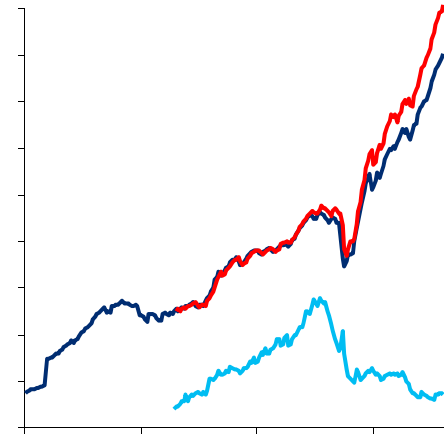
Turnover up;
liquidity not



Regulations creating
ever greater constraints



What happens when policy
and investor flows turn?



Liquidity significantly more challenged
than has been visible to date