Treasury Borrowing Advisory Committee Presentation

- ***At the November 2015 Quarterly Refunding, and consistent with a recommendation by the Committee, Treasury reaffirmed its commitment to increase Treasury bill issuance. Because of declining deficits, Treasury's borrowing needs have declined over the last several years. Thus, in order to increase Treasury bill issuance meaningfully, Treasury may need to reduce some nominal coupon or TIPS issuance over the next year or two.***

- ***We would like the Committee to discuss the appropriate size of an increase in bill issuance needed over the next couple of years. If a reduction in nominal coupon and TIPS issuance would be required, discuss how Treasury should evaluate issuance across these securities. What criteria should be considered and how should they be weighed against each other?***

Agenda

Bills supply and demand dynamics

- What are the drivers of demand for HQLA?
- What are the supply dynamics for Tbills/HQLA?
- How substitutable are various short-end products?

Given these demand dynamics, how much should TBill supply be increased?

- Are there any particular tenors of T-Bills that should be the focus of increases?
- Should Treasury consider adding an additional T-bill tenor (e.g, 2 month)?

Treasury financing needs

- What is the deficit/net borrowing needs outlook through the end of FY2017?
- With the existing auction sizes, is Treasury over financed or underfinanced? By how much?
- What is the likelihood that the Federal Reserve will begin to reduce the SOMA portfolio by end of FY2017?
- What are the estimates for the magnitude of the reductions through FY2017?
- To what extent should Treasury reduce coupon or TIPS issuance in order to increase bill issuance this year?

Framework for determining how to reduce coupon and TIPS issuance?

- What sort of framework(s)/factors should Treasury consider for evaluating where to reduce issuance?
- How should Treasury implement any such reductions in coupons and/or TIPS?
- If Treasury should reduce TIPS issuance, how should Treasury communicate the fact that it remains committed to the TIPS program?

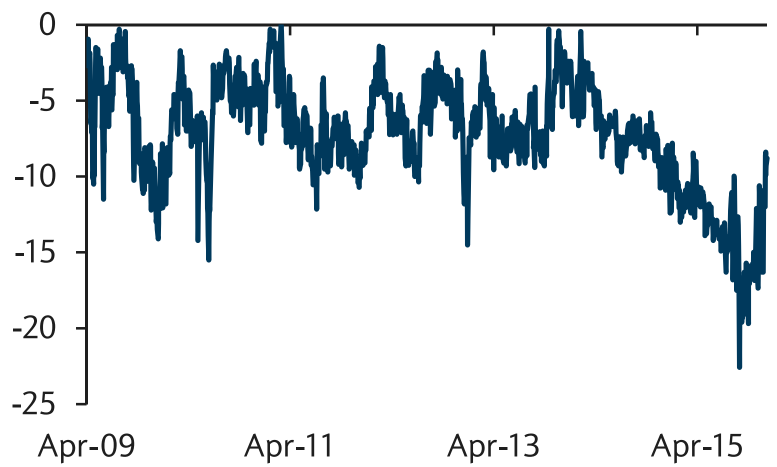
Bills supply and demand dynamics

A supply imbalance will develop for government safe assets

Est. imbalance for short term safe assets ($bn)

	2016	2017
Demand for safe ST assets		
Gov-only money fund balances	300	100
Bank deposit outflows	150	0
Other demand (HQLA, margin)	50	50
Total	500	150
Supply of safe ST assets		
Private sector repo	-90	-90
FHLB issuance	75	25
RRP usage	285	150
Total	270	85
Projected supply imbalance	**-230**	**-65**

Bill-OIS, 3m (bp)



- We expect the demand for government safe assets to exceed the available supply in 2016 and 2017
- The Treasury can fill the gap through increased bill issuance

- Even if the Treasury increases bill issuance in 2016 by $230bn **there may not be much cheapening in bill rates** given the equally strong demand
  - The bill-OIS spread may stay near the current -10bp to-15bp level
- Additional issuance in 2017 would be needed to cheapen bills
  - In 2013, when the bill/total debt ratio was last at 13%, 3m bills traded about 7bp under OIS

Source: US Treasury, Bloomberg, Barclays Research

Factors affecting bills on the demand side (1)

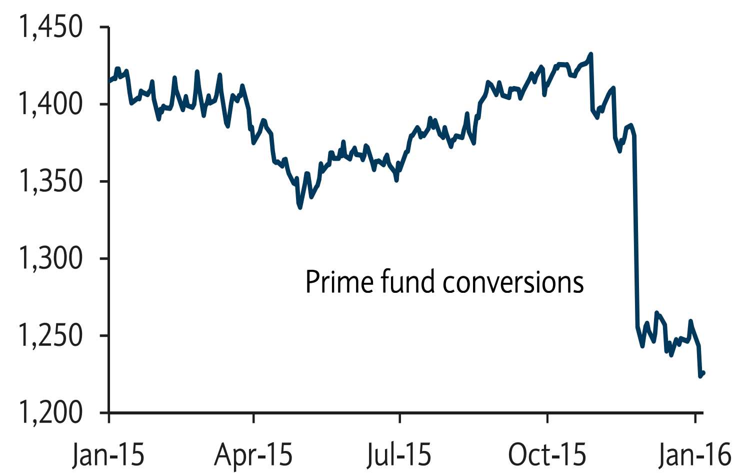
Institutional prime fund departures in 2016

- Institutional prime fund investors are likely to start leaving next year ahead of the October 2016 mandatory money fund reform deadline
- The pace and scale of the departures will depend on:
  - Level of market rates
    - Are prime fund returns high enough to overcome investor dislike of floating NAVs, liquidity fees, and redemption gates?
    - How aggressively will the Fed raise interest rates?
  - Availability of substitutes – such as bank deposits and gov-only money funds
    - Large US banks face capital and deposit insurance assessments that make them unwilling deposit recipients
- **We have little sense of how much money will leave institutional prime funds next year but our initial estimate is $300bn**

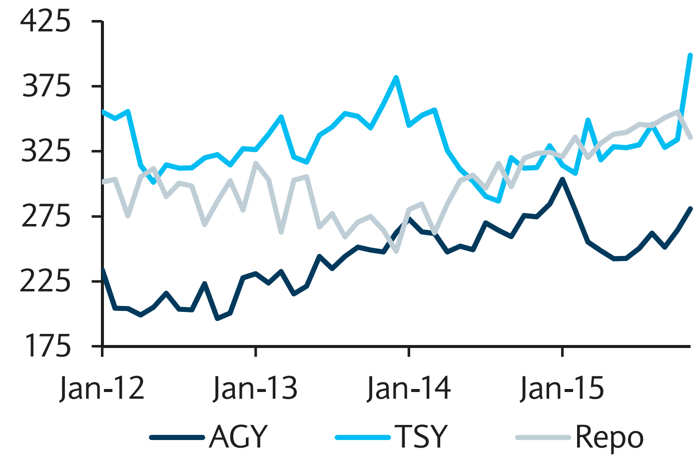
Gov-only money fund portfolio reallocation

- If $300bn leaves prime funds for gov-only funds in the first half of 2016 the demand for gov-safe assets could rise sharply
  - Based on current gov-only fund allocations:
    - Tsys +$105bn, Agencies +$85bn, Gov-repo +$111bn
  - But if agency and private sector gov-repo is less available, gov-only funds could ramp up their Treasury allocations
    - To 50% or more from 35% currently

Prime fund balances ($bn)



Gov-only holdings ($bn)



Source: Crane's Data

Factors affecting bills on the demand side (2)

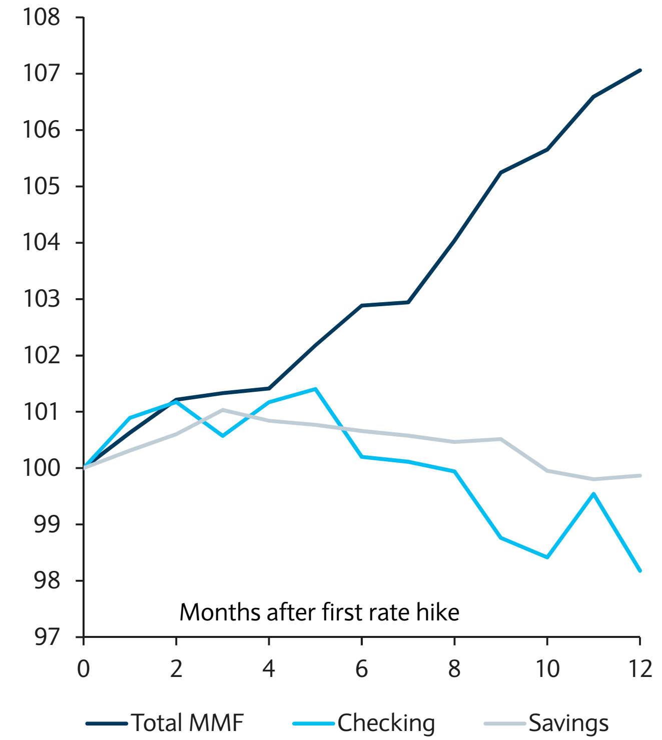
Other sources of demand

- Large US banks are eager to shed non-operating deposits as these balances are expensive for the banks to maintain
    - A shortage of safe assets for them to deploy these cash balances
    - Deposit insurance assessments are determined by the total sum of the banks' assets
    - Likewise the supplemental leverage ratio is determined by total assets (without regard to risk weighting) less capital
- One large bank has already shed $200bn in non-operating balances in 2015 (after announcing plans to shed $100bn in February 2015)
- ***There are few places for this cash to go beside government-only money funds***

Money fund balances typically increase in a tightening

- Traditionally, bank deposit rates lag the increase in the fed funds rate during a tightening
    - And deposits flow into money funds
- In past rate hike cycles, money fund balances have risen an average of 7% in the year after the first hike
    - But the increase may be larger as banks are eager to shed balances given capital and deposit insurance costs

Money fund balances (index)



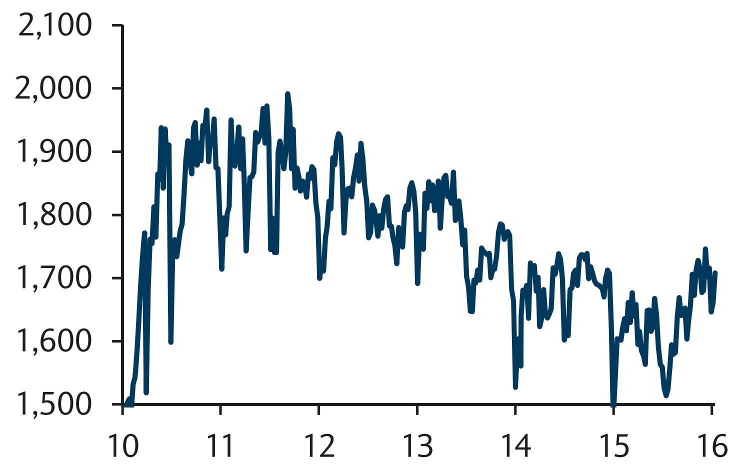
Note: Money fund balances are indexed to the first month of the tightening cycle. Average across the 1994, 1999, and 2004 cycles. Source: Federal Reserve, Barclays Research

Source: Crane's Data, Barclays Research

Factors affecting bills on the supply side (1)

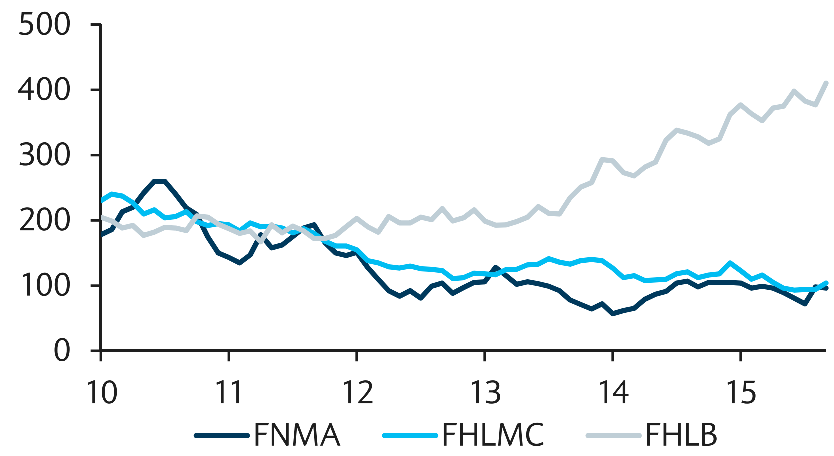
- **Less competition from private sector TSY repo**
    - Bank capital requirements become more binding
    - More institutions shift to average daily net exposure reporting
        - effectively makes “every day a quarter-end”
    - **We expect Treasury tri-party repo volumes to shrink by 20% (or $180bn) through 2017**
        - Although this is conservative given the behavior of the GCF market on quarter-ends where the decline is closer to 40%

Declining dealer Treasury repo volumes 1/ ($bn)



- **FHLB discount note issuance to slow**
    - Recent surge driven by demand for advances from a handful of large US banks (FHLB advances used to purchase HQLA)
        - FHLB discount note issuance has picked up sharply as other GSEs have stepped back from issuing disc notes
    - But in 2015, bank demand for FHLB advances began to cool as the largest banks are already LCR-compliant

Discount notes outstanding ($bn)

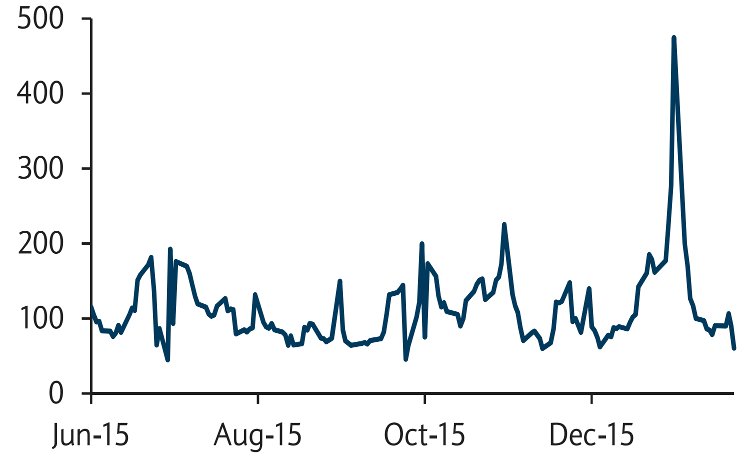


1/ Includes bilateral repo. Source: Federal Reserve

Factors affecting bills on the supply side (2)

- More collateral from the Fed's RRP
  - Close, but not perfect, substitute for Treasury bills
    - Not all cash-long institutions have access to the RRP
      - Small money funds (under $5bn in AUM), non-money market asset managers, securities lenders
  - The Fed is likely uncomfortable with an unlimited RRP program given its potential to dis-intermediate bank financing in a crisis
    - We expect a cap will be re-imposed on the RRP – perhaps as early as Jun'16, and then steadily reduced through '17

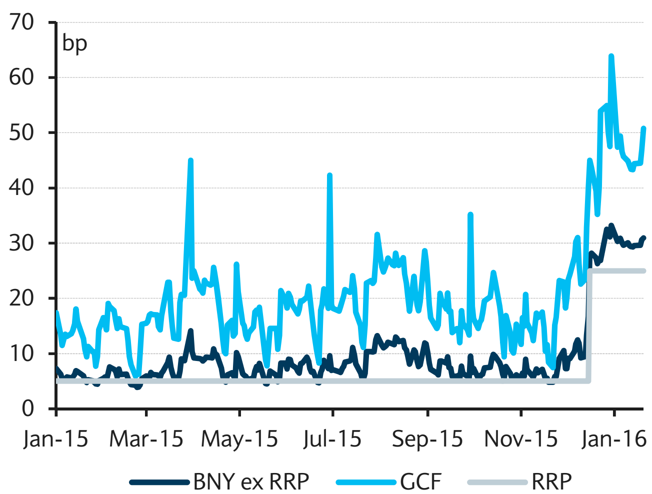
Daily overnight RRP usage ($bn)



RRP use has been moderate since lift-off

- The volume of extra collateral provided by the RRP depends on the spread between market interest rates and the RRP and dealer balance sheet capacity
  - Treasury tri-party repo rates have averaged 4bp above the RRP since lift-off
    - And this has been sufficient to keep daily program usage fairly moderate
    - Outside of the balance sheet driven surge at year-end average post-lift off usage has been $160bn/day

Tsy triparty repo rate have averaged 4bp higher than RRP



Source: Federal Reserve, Barclays Research

A new bill maturity?

Should Treasury consider adding an additional T-bill tenor (e.g, 2 month)?

- An increase in bill issuance of $230bn in 2016 might justify the introduction of a new maturity
  - Balance sheet constraints make it more difficult for the primary dealers to bid for large, pro-rata shares of super-sized bill auctions
    - Market participants seem interested in a 2m maturity
      - Other suggestions have included bills with of less than 1m to maturity
      - Or changing the settlement cycle so that some weekly bills settle on a day other than Thursday
        - But it is not clear how either would benefit the Treasury
    - Investors are somewhat familiar with the 2m maturity from the Treasury's 2009-11 Supplemental Financing Bill program

- *If the Treasury decides to introduce a new bill maturity we expect the most demand would be for a 2m security*

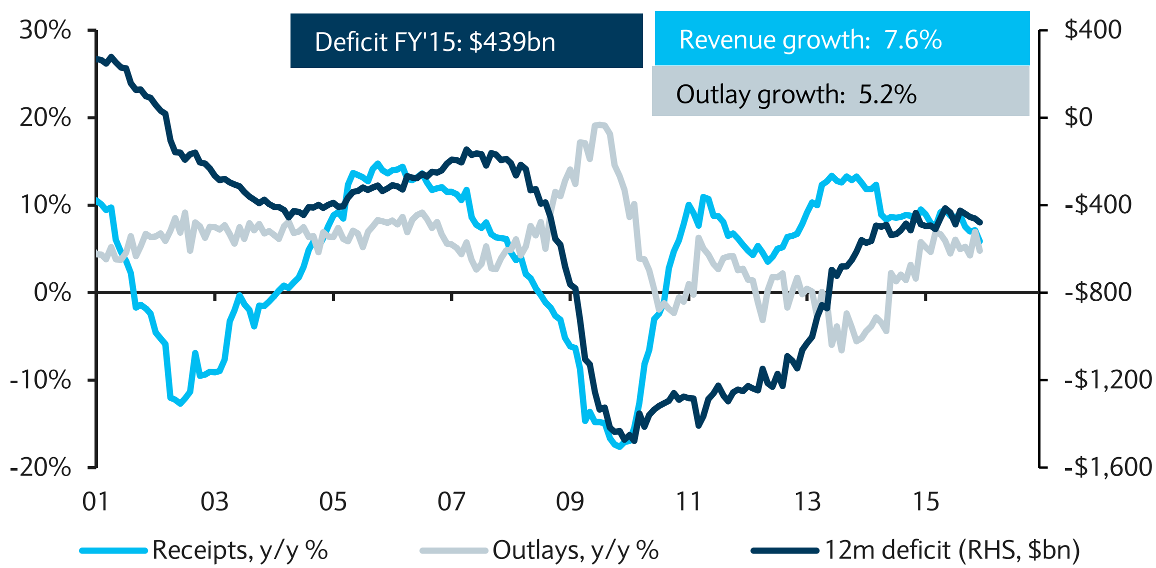
Treasury financing needs and issuance outlook

Budget deficits are likely to be higher going forward

What is the deficit/net borrowing needs outlook through the end of FY2017?

- Budget deficits have been shrinking over the last few years amid solid tax revenue growth. They seem to have stabilized recently as growth of outlays has increased
- Budget deficits expected to widen going forward amid a modest slowdown in revenue growth and a pickup in outlays. We expect budget deficits of ~$550bn in FY16 and FY17.
- The increase is largely a result of the Bipartisan Budget Act of 2015, a retroactive extension of tax provisions calendar effects. More broadly, entitlement related outlays will continue to grow

Budget Deficit Outlook



Barclays Forecast

	Revenue Growth, y/y	Outlay Growth, y/y	Deficit
FY'14	8.9%	1.4%	483
FY'15	7.6%	5.2%	439
FY'16	3.9%	6.3%	550
FY'17	4.5%	4.0%	550

Source: Haver Analytics, Barclays Research

Borrowing needs likely to remain higher than deficits

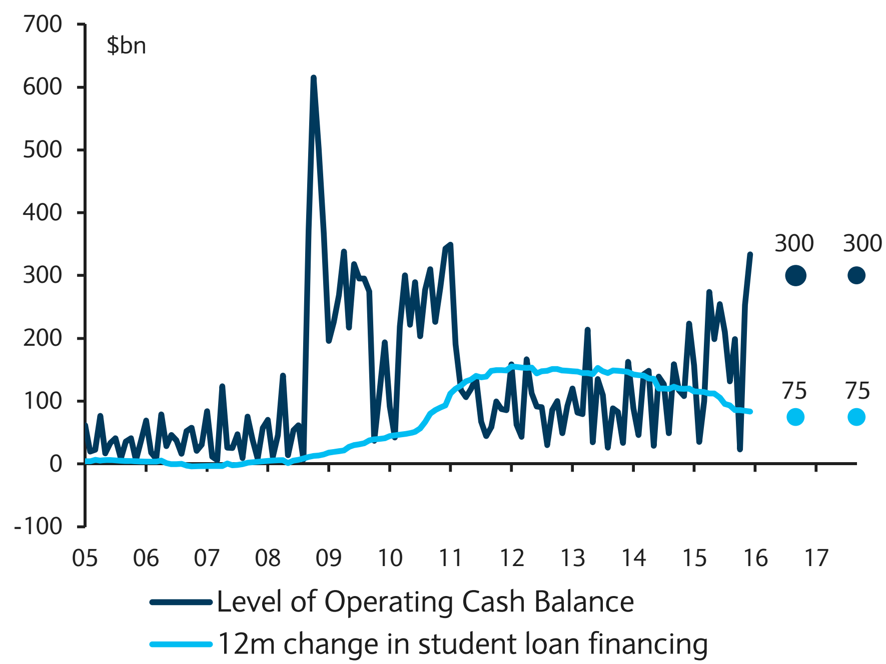
What is the deficit/net borrowing needs outlook through the end of FY2017?

- Borrowing needs are likely to be higher than budget deficits owing to changes in cash balance and other financing needs, particularly student loans
- Expect Borrowing needs of roughly $725bn in FY16 and $625bn in FY17

Net Borrowing Need Projection

	FY2015	FY2016 (Projection)	FY2017 (Projection)
Deficit (Barclays Estimate)	439	550	550
+ Increase in operating cash balance	40	100	0
Starting Cash Balance	*158*	*199*	*300*
Ending Cash Balance	*199*	*300*	*300*
+Other financing needs (inc student loan program)	79	75	75
Net Borrowing Need	558	725	625

Projection for cash balance and student loan financing program



Source: Haver Analytics, Barclays Research

The Treasury is underfinanced through FY2017

With the existing auction sizes, is Treasury over financed or underfinanced between now and then end of FY2017?

Scenario 1: The Fed continues to reinvest the entire maturing amount of Treasuries

$bn		FY2015		FY2016		FY2017
Gross to Pvt Investors (ex-bills) (A)	$	2,131	$	2,119	$	2,119
Fed Add-ons (B)	$	3	$	174	$	192
Total Gross Issuance (C=A+B)	$	2,134	$	2,293	$	2,311
Maturing Debt (ex-bills) (D)	$	1,523	$	1,738	$	1,867
Net Issuance (ex-bills) (E=C-D)	$	611	$	555	$	444
Borrowing Needs (F)	$	558	$	725	$	625
Funding gap (F-E, +ve shows underfunding)	*$*	*(53)*	*$*	*170*	*$*	*181*
Bills, % of outstanding		*10.6%*		*11.3%*		*12.0%*

With existing coupon sizes, the Treasury is underfinanced by ~$170bn in FY16 and $180bn in FY17

Bills, as % of outstanding rises to 12.0%

Scenario 2: The Fed maintains reinvestment policy in FY2016, but tapers reinvestments gradually starting after Q1'17

$bn		FY2015		FY2016		FY2017
Gross to Pvt Investors (ex-bills) (A)	$	2,131	$	2,119	$	2,119
Fed Add-ons (B)	$	3	$	174	$	164
Total Gross Issuance (C=A+B)	$	2,134	$	2,293	$	2,283
Maturing Debt (ex-bills) (D)	$	1,523	$	1,738	$	1,867
Net Issuance (ex-bills) (E=C-D)	$	611	$	555	$	416
Borrowing Needs (F)	$	558	$	725	$	625
Funding gap (F-E, +ve shows underfunding)	*$*	*(53)*	*$*	*170*	*$*	*209*
Bills, % of outstanding		*10.6%*		*11.3%*		*12.2%*

With existing coupon sizes, the Treasury is underfinanced by ~$380bn in FY2016/17
Bills, as % of outstanding rises to 12.2%

By FY'18, bills will be 13.9% of outstanding

Source: Haver Analytics, Barclays Research

SOMA Reinvestments: Likely to remain in place in 2016

What is the likelihood that the Federal Reserve will begin to reduce the SOMA portfolio between now and the end of FY17?

FOMC statement Dec'15: The Committee … anticipates [reinvesting] until normalization of the level of the federal funds rate is well under way.

NY Fed President Dudley (Jan'16): "If the economy were growing very quickly and the risks of an early return to the zero lower bound for the federal funds rate were deemed to be low, then I could see ending reinvestment at a relatively low federal funds rate…in contrast, if the economy lacked forward momentum and the risks of a return to the zero lower bound were judged to be considerably higher, I would want to continue reinvestment until the federal funds rate was higher."

Low unemployment rate, modestly above trend GDP growth and rising core inflation should allow the FOMC to begin phasing out reinvestments around Q1'17

Consensus Forecasts

Median Consensus Forecast	2015	2016				2017	
%		Q1	Q2	Q3	Q4	Q1	Q2
Real GDP (q/q saar)	2.0*	2.5	2.6	2.5	2.5	2.3	2.3
Private consumption (q/q saar)	2.7*	2.8	2.8	2.7	2.6	2.4	
Unemployment rate	5.0	4.9	4.8	4.8	4.7	4.7	4.7
Core PCE (y/y)	1.3	1.5	1.5	1.6	1.7	1.8	1.8
Fed Funds rate (upper end)	0.50	0.75	0.75	1.00	1.25	1.50	1.75

* Assuming consensus forecast of 1.4% and 2.3% in Q4 for real GDP and Private Consumption

Source: Federal Reserve, Bloomberg

Consensus for reinvestment phase out to begin in Q1'17 and last 12 months

What is the likelihood that the Federal Reserve will begin to reduce the SOMA portfolio between now and the end of FY17?

NY Fed Survey suggests Q1 17 as the start of ending reinvestments, or ~15m after the first hike

Most likely time for Fed to first cease reinvesting

	Treasuries	Agency Debt and MBS
25th percentile response	Q1'17	Q4'16
Median response	Q1'17	Q1'17
75th percentile response	Q2'17	Q1'17

Number of months relative to liftoff

	Treasuries	Agency Debt and MBS
25th percentile response	12	12
Median response	15	13
75th percentile response	18	15

NY Fed Survey suggests a 65% chance that reinvestments will be phased out - on average over 12m

Probability of phase-out process for reinvestments in Treasuries

	No change to reinvestments	Reinvestments ceased all at once	Reinvestments phased out over time
Average	19%	18%	64%

Anticipated duration of phase-out (mths)

25th percentile response	8
Median response	12
75th percentile response	12

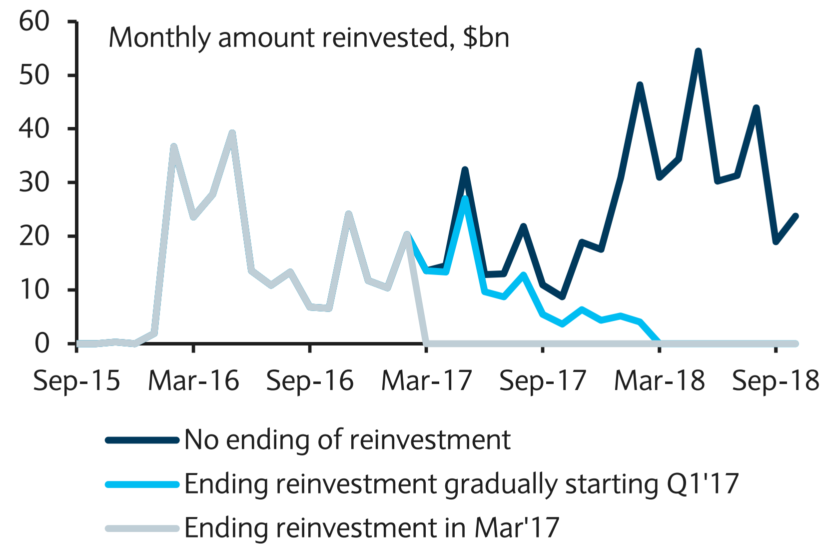
Source: NY Fed

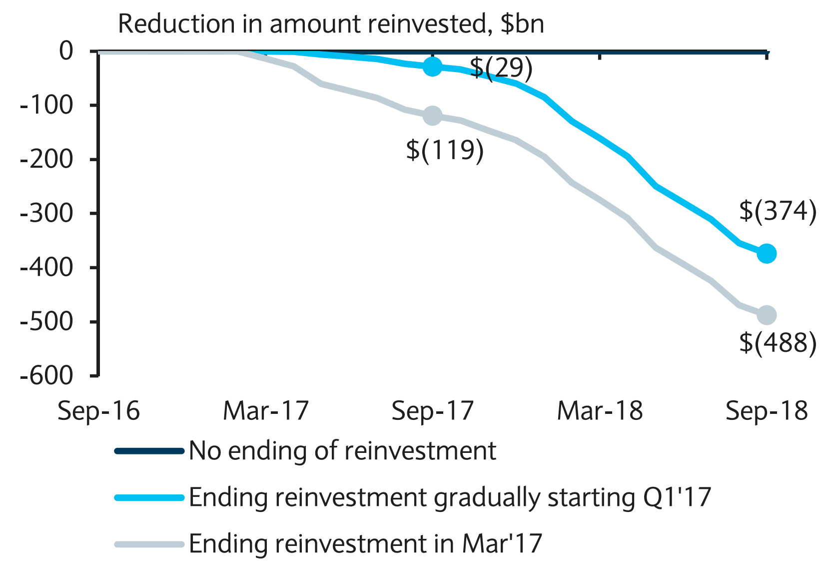
SOMA portfolio is unlikely to be materially reduced by FY 17

If the Fed decides to reduce the SOMA portfolio, what are the estimates for magnitude of the reductions through FY17?

SOMA portfolio should shrink by $29bn by FY 17 and $375bn by FY 18 assuming gradual phase out

Amt reinvested from maturing Tsy in SOMA			
$bn	No ending of reinvestment	Ending reinvestment gradually starting Q1'17	Ending reinvestment in Mar'17
FY2016	174	174	174
FY2017	192	164	73
Total	366	338	247
Cumulative Change		-29	-119





Source: Haver Analytics, Barclays Research

Room for cuts in coupon sizes

- Bill issuance to fall short of ex-ante demand in 2016 by ~$50-75bn.
- We recommend that the Treasury cut auction sizes to allow for a faster expansion of the bill universe
- **Extent of cuts should also take into account future funding gaps. Deeper cuts now would significantly increase funding gap in future years**
- For instance, if the Treasury cuts all coupon sizes by just $1bn each starting February, funding gap in FY 17 would be $295bn in addition to roughly $225bn in FY 16.
- While $225bn in net bill issuance is likely to be easily absorbed in FY 16, another $295bn in FY 17 likely to cheapen bills.
- The Treasury could also temporarily increase the cash balance in FY 16 to allow for a greater expansion of the bill universe in the near term without having to rely on cutting coupon auction sizes
- Where should the Treasury reduce auction sizes?

Est. imbalance for short term safe assets ($bn)

	2016	2017
Demand for safe ST assets		
Gov-only money fund balances	300	100
Bank deposit outflows	150	0
Other demand (HQLA, margin)	50	50
Total	500	150
Supply of safe ST assets		
Private sector repo	-90	-90
FHLB issuance	75	25
RRP usage	285	150
Total	270	85
Projected supply imbalance	**-230**	**-65**

Tsy overfinancing under scenario of Fed tapering reinvestments

$bn	FY2015	FY2016	FY2017
Gross to Pvt Investors (ex-bills) (A)	$ 2,131	$ 2,119	$ 2,119
Fed Add-ons (B)	$ 3	$ 174	$ 164
Total Gross Issuance (C=A+B)	$ 2,134	$ 2,293	$ 2,283
Maturing Debt (ex-bills) (D)	$ 1,523	$ 1,738	$ 1,867
Net Issuance (ex-bills) (E=C-D)	$ 611	$ 555	$ 416
Borrowing Needs (F)	$ 558	$ 725	$ 625
Funding gap (F-E, +ve shows underfunding)	*$ (53)*	*$ 170*	*$ 209*
Bills, % of outstanding	*10.6%*	*11.3%*	*12.2%*

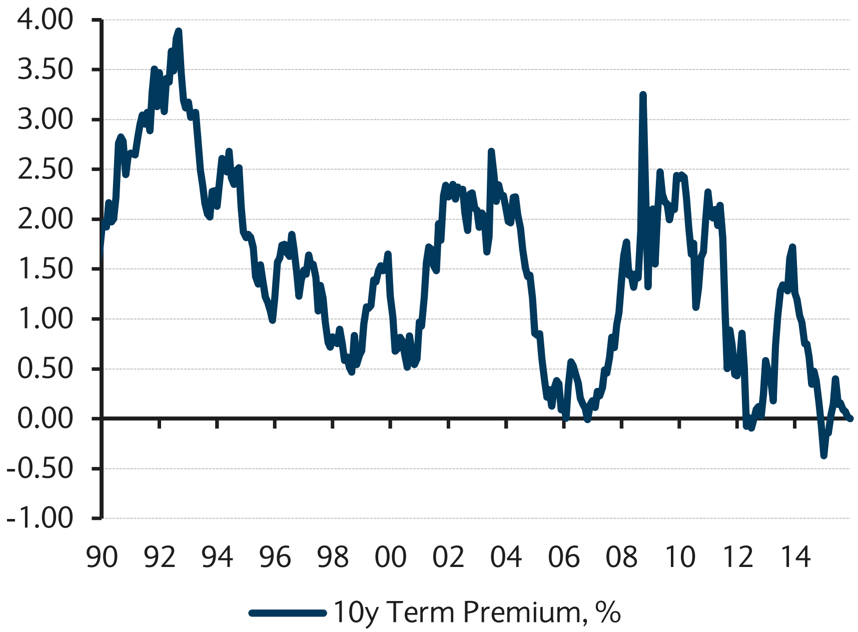
Source: Haver Analytics, Barclays Research

Ex-ante cost of issuing debt is highest at the long end

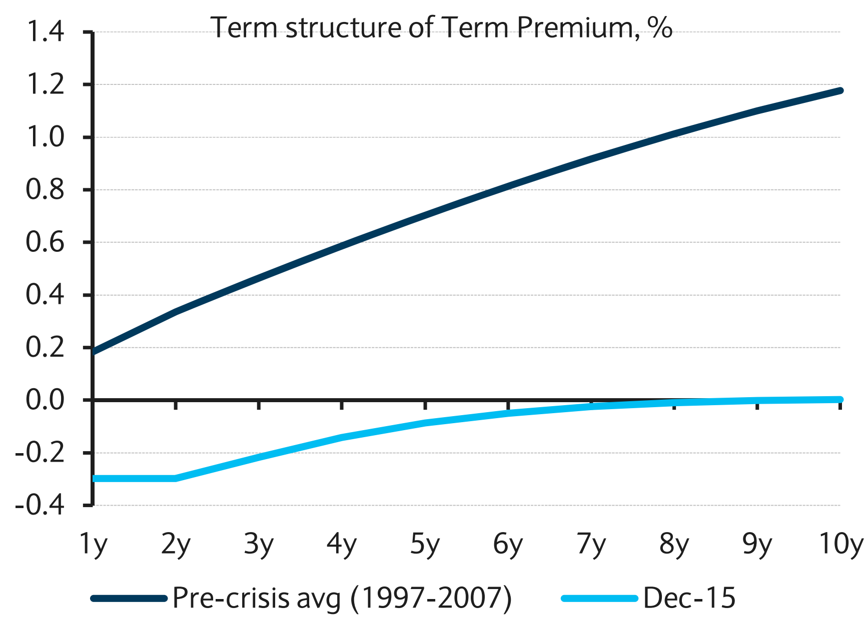
- Even though term premium has declined recently and is currently close to zero, the shape of the term premium curve remains upward sloping

- Ex-ante cost of issuing long term debt is higher than issuing short term debt

While term premium has declined…



…term structure of term premium is upward sloping

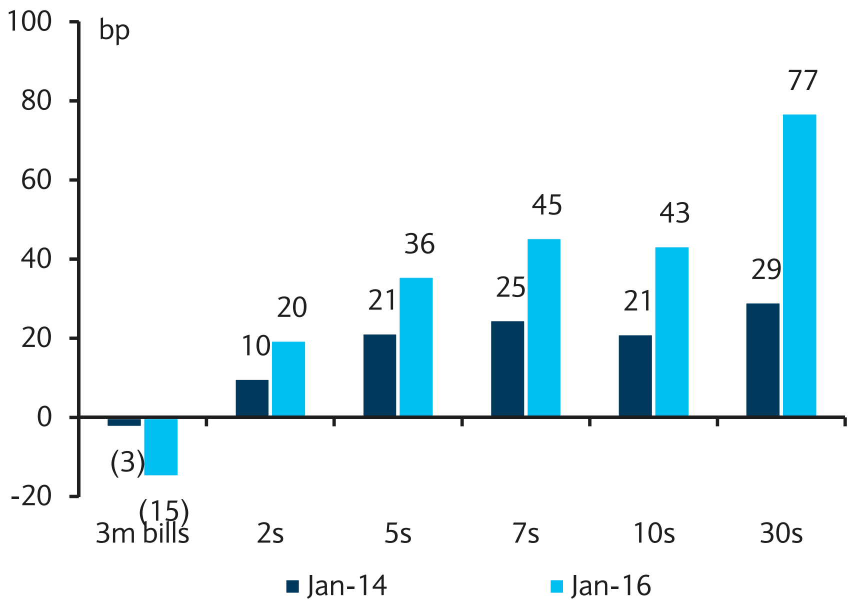


Source: Haver Analytics, Barclays Research

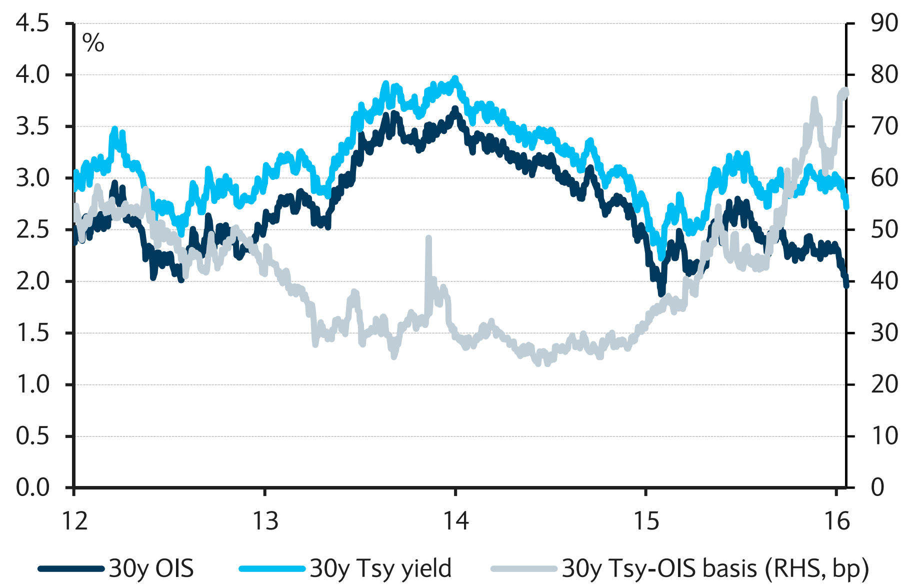
Long end is trading significantly cheap relative to OIS

- In sharp contrast to a few years ago, long end Treasuries are trading significantly cheap to OIS.
- This cheapening has happened throughout 2015 and seems persistent.
- This increases the ex-ante cost of issuing long term debt

Long end Treasuries cheap to OIS



30y Tsy have cheapened to OIS over the past year

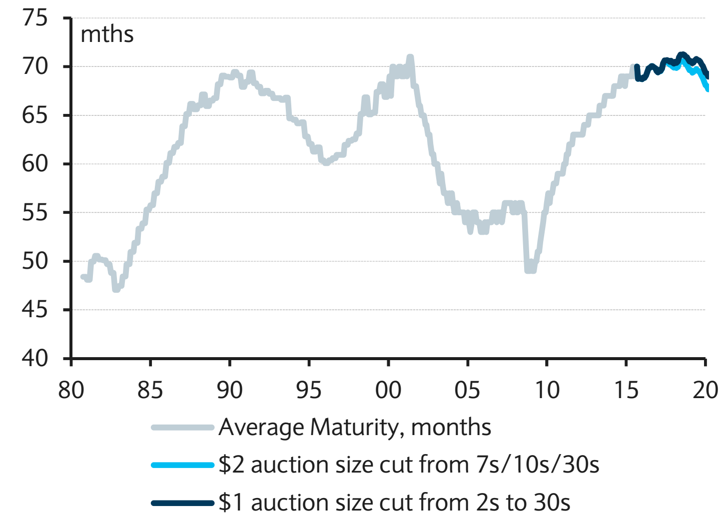


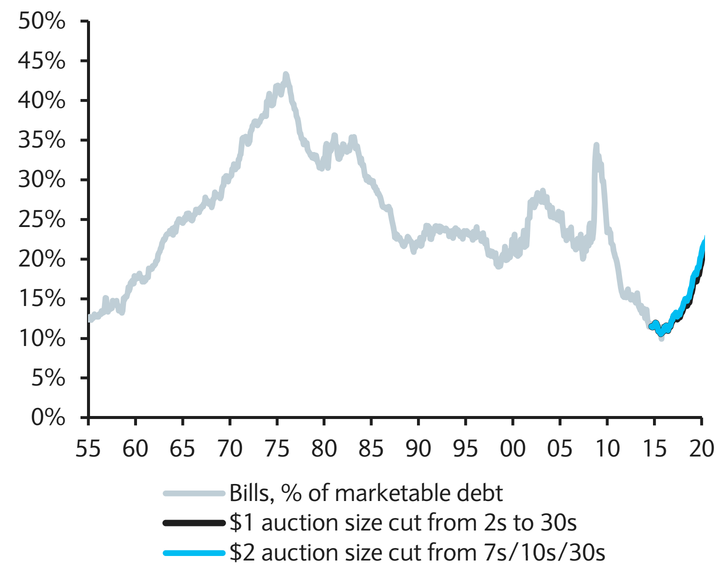
Source: Bloomberg

WAM is already close to the historical highs

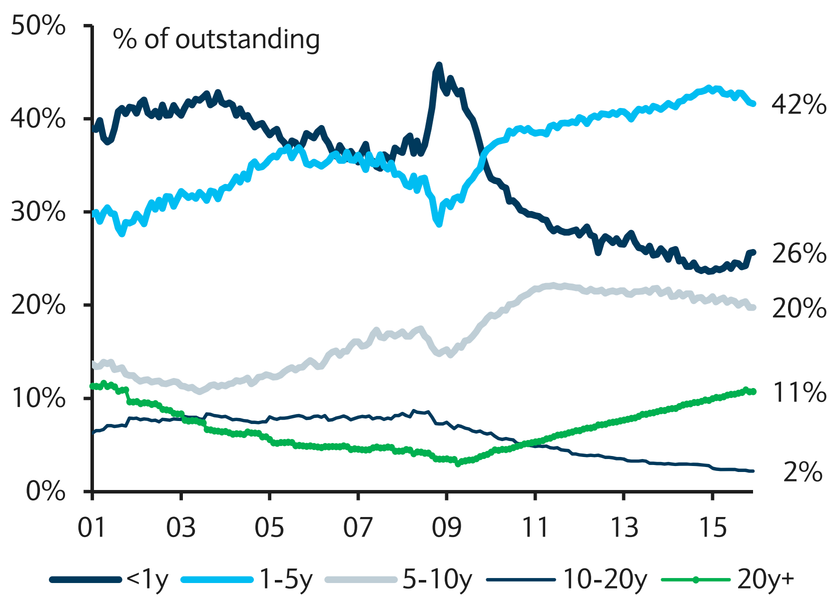
- WAM of the Treasury universe has already risen to the highs.
- % maturing at the very long end has steadily risen over the last few years.
- % bills is close to the historical lows
- These along with upward sloping term premia suggest room for long end sizes to be reduced

WAM is already at multi-decade highs and % outstanding in bills is close to the lows





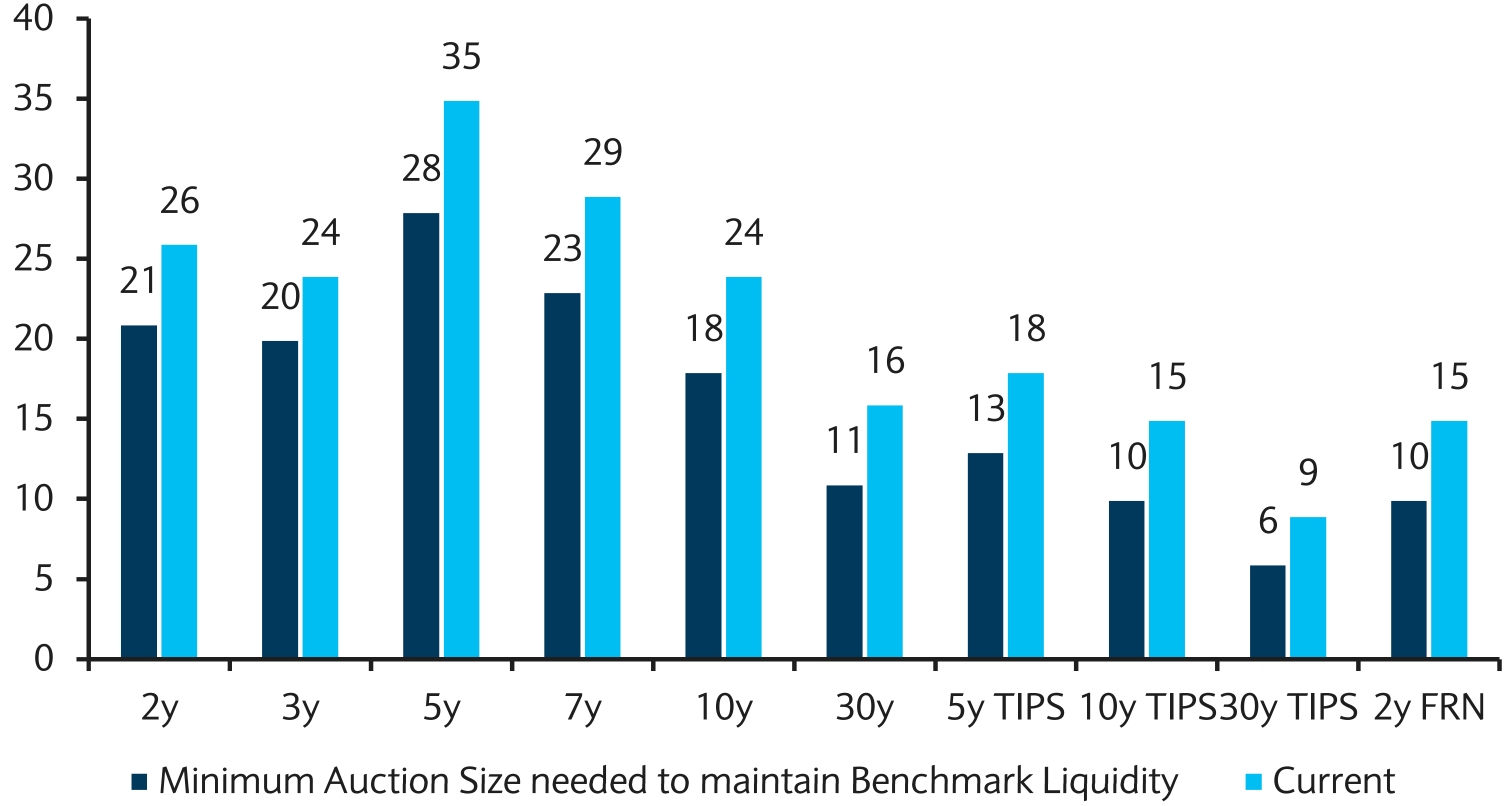
% of debt maturing in 20y+ has already risen back to the 2000 highs



Source: Haver Analytics, Barclays Research

Deep cuts in auction size of any tenor should be avoided

The Treasury should maintain a certain buffer versus the minimum size needed to maintain liquidity

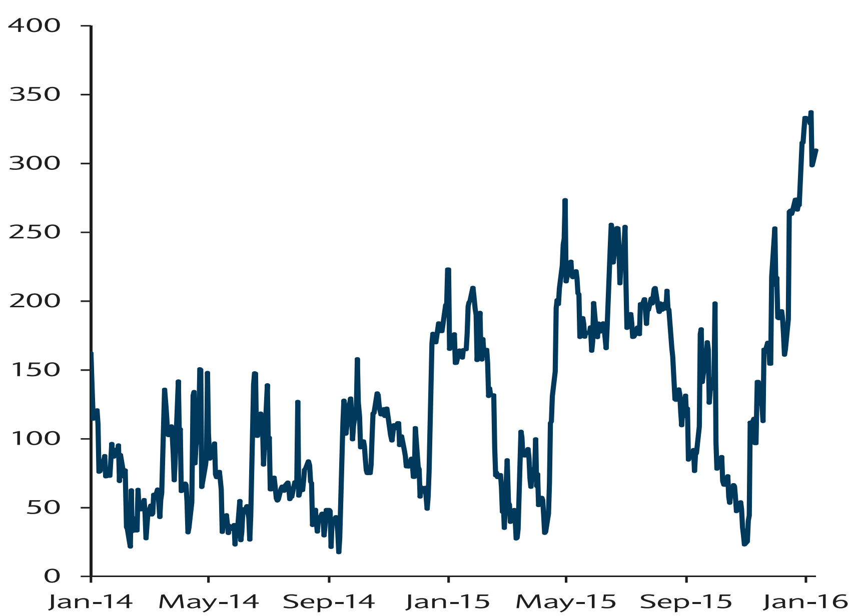


Source: US Treasury, Barclays Research

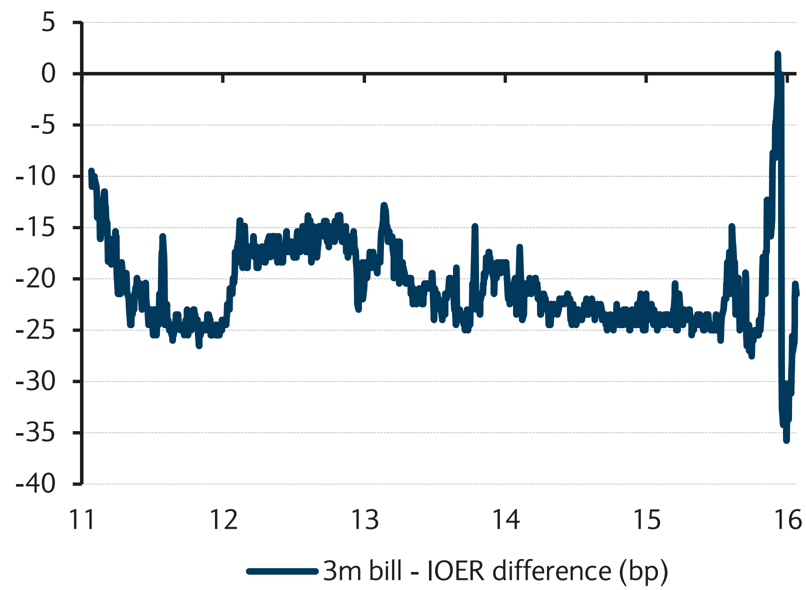
The Treasury could also rely on a higher cash balance to expand the T-bill universe in a short order

- To increase bill issuance significantly in 2016 without aggressively cutting coupon issuance the Treasury could also increase its year-end cash buffer
- TBAC recommendation was to maintain $500bn in cash balance for 10d of liquidity. YE-15 cash balance was $333bn.

The Treasury could also target a higher cash balance



Higher cash balance would result in cost savings



Source: Bloomberg

The Treasury should also consider reducing TIPS issuance

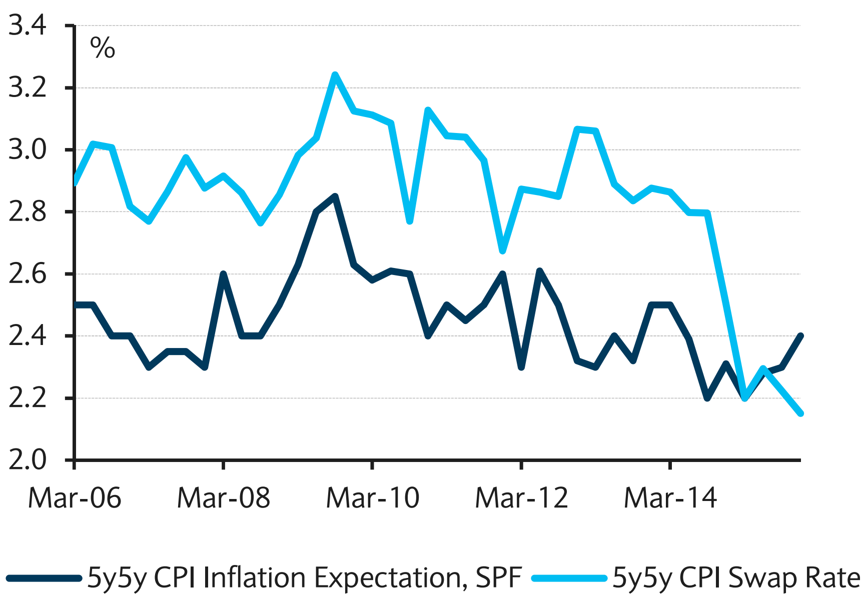
•The Treasury should also consider reducing TIPS issuance, along with nominals coupon Treasuries

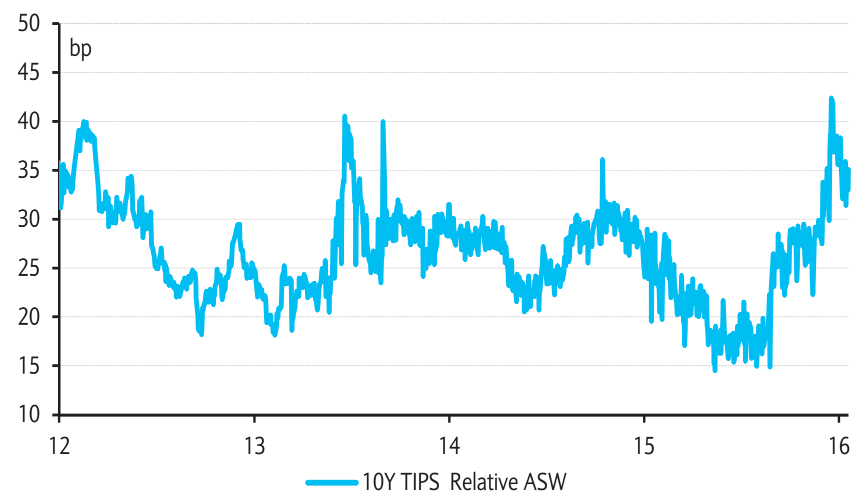
•TIPS' share of net coupon issuance would rise to about 17% and TIPS current share of the outstanding stock would also rise from about 10.3% to 10.6% by year-end.
•It should not increase TIPS relative to nominal coupon supply as a time when structural demand for the asset class may have declined.

- •Foreign official institutions may have reached a steady state in their TIPS holdings as a percentage of FX reserves. Risk-parity funds, a historically important TIPS demand base, may also be less keen on the asset class because of its increase volatility and correlation of breakeven performance with risk assets.

•It appears that inflation risk premium is much lower now where as illiquidity discount has remained persistent suggesting a greater cost in issuing TIPS relative to Nominals.

Inflation risk premium is likely now negative and illiquidity discount has remained persistent





Source: Haver Analytics, Barclays Research

Implementation / Communication strategy

- Overall, the Treasury should consider making modest cuts to coupon auction sizes.
- Long end of the nominal curve and TIPS appear to be the best candidates for making modest cuts
- Were the Treasury to pursue much deeper cuts, they should be spread across all tenors to maintain a buffer to minimum size needed for liquidity
- The Treasury should gradually reduce auction sizes maintaining its policy of being regular and predictable.
- Specifically with respect to TIPS, the Treasury should emphasise commitment to the program.
    - It should stress that reduction in TIPS auction sizes is in line with the overall policy of reducing coupon sizes to make way for T-bills.
    - Highlight that from the peak, reduction in nominal coupon sizes is still larger than that for TIPS
    - Note that TIPS auction sizes may very well be raised again if coupon auction sizes are raised.

- The Treasury should increase the frequency of new issue 5y TIPS auctions

    - The Treasury should issue the same, or slightly lower, annual amount but across two cusips, each reopened once, where one would mature in April and the other in October.

    - This would add another maturity seasonal point to the curve; this would help the inflation derivatives market . The Treasury should point to this as an example of greater commitment to the inflation market.

    - The Treasury would save borrowing costs through a lower auction concession which will reduce the need to cut sizes.

    - Most April issues trade cheap because of their large size. The large size of the April series also exacerbates the pressure on them when they roll out of 1-30y TIPS indices