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The Domino Effect of a US Treasury Technical Default

- We explore the systemic risks that would result from a technical default in the US Treasury market; although we view a default as extremely unlikely, assessing these tail risks is an important part of risk management and is useful in understanding how markets might behave in advance of a potential default
- Our analysis suggests that any delay in making a coupon or principal payment by Treasury would almost certainly have large systemic effects with long-term adverse consequences for Treasury finances and the US economy
- A technical default raises the risk of a flight to liquidity out of government money funds; because daily liquidity and stable NAV are of paramount importance to these investors, a Treasury default could trigger an increase in redemptions similar to that seen in 2008
- Repo market haircuts would likely rise sharply, causing deleveraging in lending markets
- Foreign demand for Treasuries could be adversely impacted; a worrisome precedent is the 40% decline in foreign holdings of GSE debt following conservatorship despite Treasury assurances that it stands behind the GSEs
- A 20% decline in foreign demand would have a dramatic impact on Treasury borrowing costs; we estimate Treasury yields would rise 50 bp, causing growth to slow and deficits to rise

Overview

In an April 4 Letter to Congress, Treasury Secretary Geithner wrote that without Congressional action, Treasury would reach the statutory debt limit on May 16, and that extraordinary measures would only allow the Treasury to avoid defaulting on its obligations

until July 8.¹ He further warned that “**default would cause a financial crisis potentially more severe than the crisis from which we are only now starting to recover.**”

In this research note, we explore the systemic risks that are likely to follow a technical default in the US Treasury market. By technical default, we mean a situation where the failure to raise the debt ceiling causes the Treasury to miss a coupon or principal payment on an outstanding obligation, but where the delay is quite short-term (less than a few days) and is not viewed by the market as reflecting a real deterioration in the solvency of the US. Although we view a default as extremely unlikely, assessing these tail risks is an important part of risk management and is useful in understanding how markets might behave in the period leading up to a potential Treasury default.

Our analysis suggests that any delay in making a coupon or principal payment by the Treasury—even for a very short period of time—would almost certainly have large systemic effects with long-term adverse consequences for Treasury finances and the US economy. These effects would be transmitted through three primary channels: US money funds, the Treasury repo market, and the foreign investor community, which holds nearly half of all Treasury securities. Our main conclusions are as follows:

- A technical default raises the risk of a flight to liquidity out of government money funds, potentially triggering an increase in redemptions similar to that seen in 2008
- Repo markets will be severely disrupted as haircuts are raised and could result in a significant deleveraging event
- Even if the technical default is cured immediately, foreign demand for Treasuries could be permanently impaired. As a case in point, we note that even without any kind of default, Fannie Mae and Freddie

¹ <http://www.treasury.gov/connect/blog/Pages/letter-to-congress.aspx>

Mac's move into conservatorship has led to permanently lower foreign sponsorship of GSE debt.

We explore these channels in detail in the discussion below. Finally, we emphasize that even if the debt ceiling is ultimately raised before a technical default occurs, **the delay in raising the debt ceiling is likely to negatively impact markets, as investors undertake risk-management actions in preparation for a potential Treasury default.** Delay could also reaffirm the notion that the political compromise necessary to forge longer-term fiscal solutions is lacking, something that S&P noted in its decision to move its US ratings outlook to negative on Monday.²

Lehman 2.0: money markets and the risk of redemptions

Government money funds currently hold \$760 bn of Treasury and Agency securities and repo. Given that these investors are primarily concerned with liquidity, they are likely to be most impacted by a technical default regardless of how quickly it cures. While we believe that a technical Treasury default would not automatically trigger selling, concern over a possible surge in shareholder redemptions would probably lead funds to build cash or limit investing to overnight obligations. As the report of the President's Working Group on Money Market Funds Reform³ noted, "[money market funds'] history of maintaining stable value has attracted highly risk-averse investors who are prone to withdraw assets rapidly when losses appear possible."

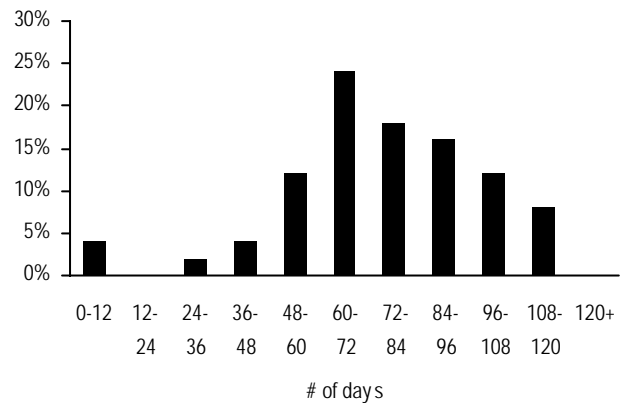
Adverse reaction from money market investors appears likely to stem from two sources. First, while we think most funds would continue to buy short-dated bills and roll over Treasury repo, demand for Agencies could falter much as it did in late-2008, and yields would climb as a result. This reflects our best judgment that short-dated Treasury securities will remain relatively more liquid than Agencies (which are implicitly supported by Treasury) in the event of a technical default. Nor would the Agency product be alone, as liquidity across all money market instruments would

² "United States of America 'AAA/A-1+' Rating Affirmed; Outlook Revised to Negative," Nikola G Swann, et al, Standard & Poor's, 4/18/11.

³ <http://www.sec.gov/rules/other/2010/ic-29497.pdf>

Exhibit 1: Some government money funds that hold a higher proportion of Agency FRNs have WALs close to 120 days

Distribution of weighted average life for government money funds as of February 2011; %



Source: Crane Data

likely be impaired following a Treasury default, even one viewed as temporary.

The second concern stems from the impact of rising yields on net asset values (NAV). If yields rise enough, asset values could theoretically "break the buck." To be sure, the hurdle for NAVs to fall below the \$0.995 threshold is high, and Agency or Treasury yields would have to spike by a considerable amount. But while the average government fund has a weighted average maturity (WAM) of only about 45 days, some funds have weighted average lives (WAL) as long as between 110 and 120 days, reflecting a higher concentration of Agency FRNs (**Exhibit 1**). For these funds, a 150-175 bp spike in front-end yields could lower NAVs below \$0.995.

Even if yields don't rise enough to cause funds to break the buck, the pressure of liquidating assets at a NAV below \$1.00 could put extreme pressure on fund sponsors and possibly lead one or more to halt redemptions. **Because daily liquidity and a stable NAV are what money fund shareholders care most about, a halt in redemptions at one fund is likely to cause broader outflows even if the Treasury's technical default is recognized as temporary and not a credit issue.**

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In the two days following the Lehman failure in 2008, the Reserve Primary Fund, which held less than \$1 bn (1.5% of its \$62 bn in assets) in Lehman debt, received redemption requests totaling \$40 bn. The fund quickly ran through its cash reserves and then sought to liquidate portfolio holdings, further depressing the price of those securities. The fund announced on September 16 that they had broken the buck with an NAV of \$0.97. As a result, prime institutional money market funds faced enormous redemption pressure. In the week following the Lehman bankruptcy, over \$300 bn of assets exited prime institutional money market funds as institutional investors no longer felt safe holding their money in these funds, and these outflows eventually reached nearly \$500 bn before recovering (**Exhibit 2**). On September 17, Putnam's institutional money market fund, due to significant redemption pressure, announced they would close the fund; one week later Federated announced it was acquiring the Putnam fund, ultimately preventing losses to the investors.

The run on prime money funds was halted only by extraordinary measures undertaken by Treasury and the Federal Reserve. On September 19, the Treasury and the Fed jointly announced a temporary guarantee of money market funds (TGP), and a liquidity facility extending credit to banks to finance their purchases of ABCP (AMLF). These actions helped stabilize the outflows and by mid-October, prime money funds began to again see inflows.

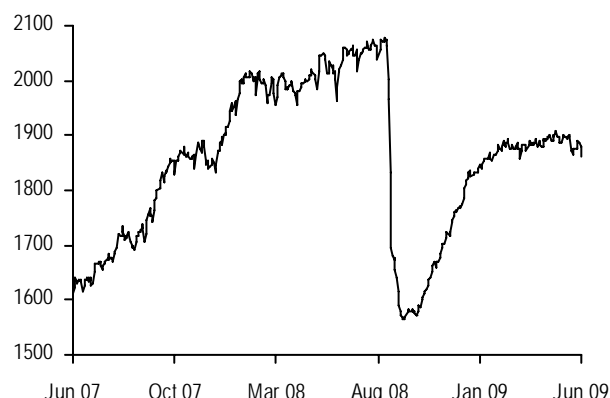
In sum, while most money market investors will likely not view a technical default as a credit issue, a technical default may nonetheless trigger a flight to liquidity that could ultimately be profoundly disruptive.

Deleveraging in Treasury repo markets

Treasuries have historically been viewed as the highest quality and safest asset, a status which has made them the vehicle of choice in collateralized lending agreements. We estimate that over \$4 trillion of Treasuries—nearly half of the outstanding stock—are used as collateral for repo agreements, futures clearinghouses and OTC derivatives (**Exhibit 3**). A sharp repricing of this collateral in response to a Treasury default would likely increase haircuts, potentially leading to significant margin calls, some

Exhibit 2: A single fund halting redemptions could trigger a broader run on money funds, similar to the aftermath of the Lehman failure

Prime money market fund balances (Taxable funds); \$ bn



Source: iMoneyNet

Exhibit 3: Over \$4 tn of Treasuries are used as collateral in the repo and derivatives markets

Estimated Treasury securities in use as collateral: \$ bn

Repo agreements	3,943
OTC derivatives	114
Listed derivatives	118
Total	4,175

Source: Repo data are for primary dealers as reported to the Federal Reserve Bank of New York; OTC derivatives are from 2010 ISDA Margin Survey; listed derivatives are estimated from clearinghouse margin data and J.P. Morgan

forced deleveraging, and a decline in lending capacity in financial markets.

In the event of a default, we would expect to see haircuts rise on Treasuries as higher volatility forces lenders to increase collateral requirements. We estimate that the average haircut for Treasury repo (across all durations) is currently 0.5%, but we could see haircuts rise toward 1.5%, the average level during the financial crisis. Other related collateral would likely be affected as well: during the repo market crisis of 2008, haircuts on Agency MBS doubled from 5% to 10%, causing significant deleveraging by investors, and this activity caused mortgage spreads to widen 150 bp (**Exhibit 4**).

Although leverage among market participants is considerably lower than in 2008, we would still expect to see some forced deleveraging as a result of increased haircuts. For example, REITs, which finance their MBS purchases with repo, would likely need to

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delever; their selling of MBS would likely push mortgage rates higher, potentially inducing others to sell. In addition, we think relative value hedge funds and Asian banks may also delever.

Regardless of the initial magnitude, we emphasize that any deleveraging activity may be damaging for markets: as we saw in 2008, forced deleveraging begets further deleveraging, as declining prices force more and more investors to liquidate their positions.

Impact on Treasury funding costs

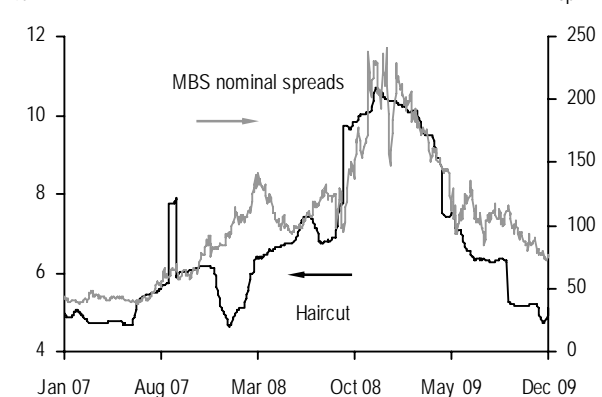
When assessing the potential impact of a default on Treasury yields, we think it is useful to differentiate between the immediate market response and the likely long-term consequences. In the short run, a technical default will likely push yields higher as investors absorb negative headlines. Even if such a near-term rise in yields is retraced after an eventual increase in the debt ceiling, however, it could leave lasting damage in its wake due to a permanent decline in foreign demand, which will likely lead to higher borrowing costs and larger deficits.

To gauge the near-term impact, we look to other examples of technical sovereign defaults that have cured rapidly. Over the past twenty years, there have been four such “grace period defaults,” and in each case, the default was accompanied by a ratings downgrade (**Exhibit 5**). Only one of these defaults was not directly related to a solvency issue, however, making it somewhat analogous to the current US situation—the Peru experience of 2000. In that event, Peru chose to not pay a coupon on September 7 in order to avoid deleterious consequences in its legal battle with the hedge fund Elliott Associates; once the lawsuit was settled, however, the coupon was promptly paid. As a result of the missed payment, Peru’s credit rating was lowered from Ba3 to B1 and then restored to Ba3 immediately after the coupon payment was made.

Even without ratings agency action, we would expect to see an immediate rise in yields on the back of a technical default. Although it is difficult to isolate the impact of the missed coupon on yields given the political scandal around President Fujimori that erupted shortly thereafter, the Peru experience nonetheless gives us some guidance; based on the widening of Peru

Exhibit 4: During the repo market crisis of 2008, the doubling of Agency MBS haircuts led to significant deleveraging and a sharp widening of spreads

Vol-adjusted Agency haircuts* and MBS nominal spreads to Treasuries;
%



* J.P. Morgan estimate for 1-month term repo.

Exhibit 5: Past grace period defaults

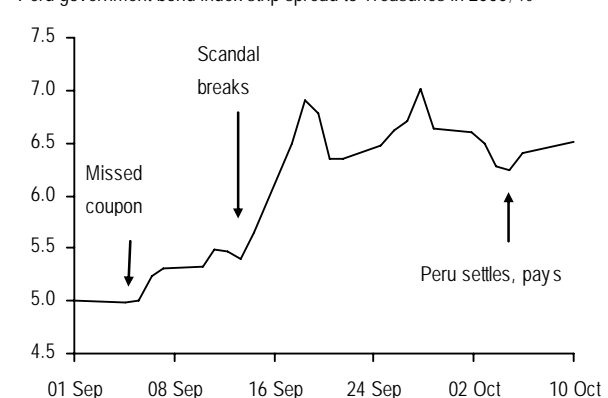
Summary of past grace period defaults*

Country	Date	Ratings action	Deteriorating credit?
Pakistan	Nov-98	Downgraded: B3 to Caa1	Yes
Peru	Sep-00	Downgraded: Ba3 to B1	No
Moldova	Jun-01	Downgraded: B3 to Caa1	Yes
Dominican Republic	Jan-04	Downgraded: B2 to B3	Yes

* Indicates that the default was cured within the grace period

Exhibit 6: We estimate that the missed coupon in September 2000 caused Peruvian yields to rise about 50bp

Peru government bond index strip spread to Treasuries in 2000; %



spreads in the immediate aftermath of the missed coupon, and the narrowing after the coupon was paid,

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we estimate the short-term impact on yields to be about 50bp (**Exhibit 6**).

This estimate is also roughly in line with investors' current expectations of the impact of a potential Treasury technical default. We asked 45 of our large rates clients how much they thought 10-year Treasury rates would increase if Treasury temporarily missed a coupon payment but announced it planned to make payment as soon as the debt ceiling is raised, and the mean response was a 37 bp increase in yields, although the uncertainty was very high (**Exhibit 7**). Notably, however, *foreign investors* expected a significantly larger initial increase—55 bp—than domestic investors.

Beyond any potential near-term impact, the long-term damage is likely to come in two forms. One is the risk of ratings downgrades down the road. We have previously estimated that a 1-notch downgrade could trigger a 100 bp rise in yields (see Treasuries, *US Fixed Income Markets Weekly*, 1/21/11). Congressional deadlock around increasing the debt ceiling could be viewed as increasing the long-term risk of inaction on fiscal policy reform, something S&P already has alluded to in its action to move the US sovereign ratings outlook to negative.

Even more significant, however, is the risk of lasting damage from a loss of sponsorship from foreign investors, similar to what happened to GSE debt holdings after the Agencies entered conservatorship. Despite Treasury's assurances that the US stands behind GSE debt, foreign investors liquidated nearly 40% of their holdings of GSE debt in the year following the placement of Fannie Mae and Freddie Mac under conservatorship, and these investors never returned. As **Exhibit 8** shows, foreign holdings of Agency debt steadily declined after conservatorship, and they have held steady at around half the size of their 2008 peak.

Even a modest decline in foreign holdings of Treasuries following a default would have a dramatic impact on Treasury borrowing costs. We estimate a 20% decline in Treasury holdings by foreign investors completed over a 1-year period would push Treasury yields higher by 50-60 bp (see grey box). A 50 bp increase in yields would increase annual deficits

Exhibit 7: Our clients expect a 37 bp rise in rates in the event of a technical default

Estimated increase in 10-year Treasury rates following technical default; % of respondents in each category

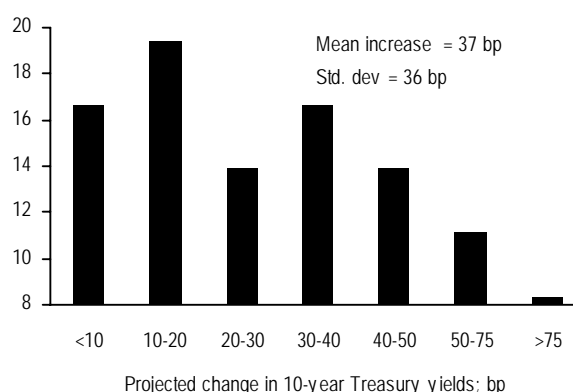
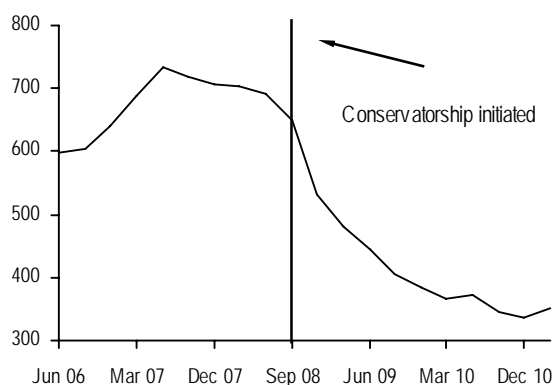


Exhibit 8: We think the bigger risk to the Treasury market is from foreign investors; the experience with GSE debt in 2008 suggests a technical default could permanently impact demand

Estimated foreign holdings of Agency debt* around the announcement of GSE conservatorship; \$bn



* Agency debt holdings are the TIC annual survey data for release dates (June 30) for each year through 2010; data between release dates is estimated using weekly Agency custody holdings data released by the Federal Reserve

by \$10 bn in the short run, and by \$75 bn per year over time as outstanding debt rolls over.

The impact on economic growth

Beyond the impact on borrowing costs, the failure to raise the debt ceiling in a timely fashion and a potential default would have real negative consequences for growth. Although it is difficult to quantify the total impact on GDP from a technical default, we can estimate the impact of the associated rise in rates as

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Measuring the impact of foreign selling: J.P. Morgan long-term model for 10-year Treasury yields

To estimate the impact of a structural change in foreign demand on Treasury yields, we use the parameter estimates from our long-term model of 10-year yields. The model, which is estimated using 20 years of data, models 10-year Treasury yields as a function of (a) core inflation, (b) the real funds rate, (c) one-year ahead consensus growth forecasts and (d) the budget deficit as a percentage of GDP. As shown in the table below, increases in the real funds rate, core inflation, the consensus growth outlook, and the budget deficit all result in higher 10-year Treasury yields.

Since increases in the budget deficit lead to an increase in Treasury supply, we can use the model to estimate the yield impact from a net supply shock due to foreign selling of Treasuries. Specifically, our model suggests that an increase in Treasury supply of \$148bn annually (i.e. 1% of GDP) or \$12 bn per month is likely to cheapen 10-year Treasuries by 6.6bp. A 20% decline in foreign holdings over 1-year amounts to a net increase in monthly supply of \$100 bn (\$65 bn per month of selling versus \$35 bn per month of buying currently). This implies an increase in the fair value of 10-year yields of 56 bp ($6.6 \times 100/12$).

10-year Treasury yield model parameters:*

Variable	Current level	Coefficient	T-statistics
Intercept	-	0.37	1.4
Core CPI yoy*; %	1.01	1.21	25.0
Real funds rate**; %	-0.64	0.44	12.8
Real GDP forecast***; %	3.34	0.38	6.1
Budget deficit ; % of GDP ⁺	8.33	0.066	3.7

Model estimated over last 20-years. R²= 80%; Std. error of regression =

* 3-month moving average of yoy core CPI rate

** 3-month moving average of the real funds rate as measured by rate implied by 1st

Eurodollar contract minus yoy core CPI

*** 3-month moving average of 1-year ahead Blue Chip real GDP growth forecast

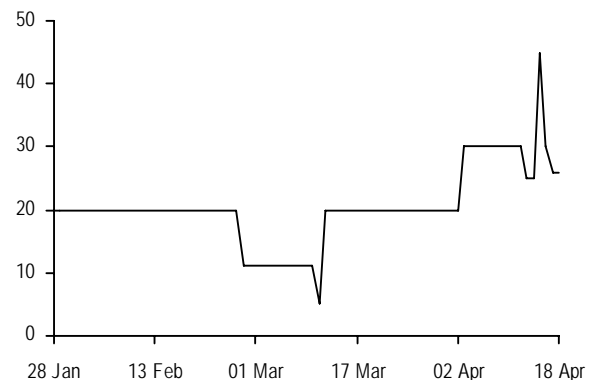
+ 3-month moving average of budget deficit as percentage of GDP

well as the wealth effects of an accompanying sell-off in equities. A Federal Reserve paper on the macroeconomic implications of changes in term premium⁴ suggests that a 100 bp rise in term premium lowers GDP by 0.8%; thus, if Treasury yields were to rise 50 bp as we project, GDP would likely be reduced by about 0.4%. In addition, the equity market would likely sell off sharply in response to a technical default, as it did on the day that Congress initially failed to pass TARP in September 2008. On that day, the S&P 500

⁴ "Macroeconomic Implications of Changes in the Term Premium," Glenn D. Rudebusch et al, Federal Reserve Bank of St. Louis Review, July/August 2007.

Exhibit 9: With the caveat that trading volumes are not large, one online market suggests there are considerable odds that the debt ceiling won't be raised by June 30

Odds that the debt ceiling won't be raised by June 30 as implied by Intrade contract*



* Contract payoff is \$10 if Congress approves increase in US debt ceiling to \$15.1T or more before midnight ET 30 Jun 2011; \$0 otherwise.
Source: www.Intrade.com

fell 9%; using this as a rough guide, we estimate that a decline of a similar magnitude on a sustained basis in the aftermath of a default would take an additional 0.5% off of GDP growth due to lower consumption. Thus, the quantifiable effects of a default alone would likely take about 1% off of GDP growth, and the ultimate damage could be far greater.

The impact of the battle over the debt ceiling, even without a default

Even if Treasury avoided a default, we think the delay in raising the debt ceiling is likely to negatively impact markets, as investors undertake risk-management actions in preparation for a potential Treasury default. Already, some market indicators are showing considerable odds that the debt ceiling won't be raised by July (Exhibit 9). **Because the tail risks from a technical default are so large, a prolonged delay in raising the debt ceiling seems likely to impact markets well before a default actually occurs.** These effects could include liquidity shortages over the late June/July period as borrowers attempt to raise additional cash and increase the tenor of their borrowings, large auction concessions especially if Treasury were to postpone an auction, increases in option volatility that cover the June/July period, and generally weaker demand for Treasury securities as

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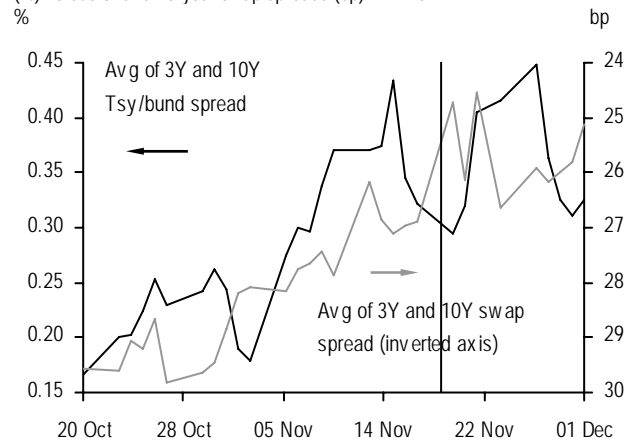
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uncertainty on whether the debt ceiling will be raised grows. Indeed, when the government shut down in November 1995 due to similar debt ceiling issues, Treasury delayed the 3-year and 10-year note auctions by eight days. As a result, 10-year Treasuries cheapened 25 bp (**Exhibit 10**).

Finally, we highlight that these seemingly prudent risk-management activities in preparation for a potential default could unintentionally bring about the very run on liquidity that these activities are meant to prevent, as one firm raising additional cash provokes similar action by other large firms.

Exhibit 10: Delays in scheduled bond auctions have historically caused Treasuries to underperform

Average spread between 3- and 10-year US Treasury yield minus Bund yields (%) versus 3- and 10-year swap spreads (bp) in 1995



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