

# ATI: Activist Treasury Issuance and the Tug-of-War Over Monetary Policy

July 2024

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## Executive Summary

By adjusting the maturity profile of its debt issuance, Treasury is dynamically managing financial conditions and through them, the economy, usurping core functions of the Federal Reserve. We dub this novel tool “activist Treasury issuance,” or ATI. By manipulating the amount of interest rate risk owned by investors, ATI works through the same channels as the Fed’s quantitative easing programs.

ATI has been a major market driver over the past year and we expect it will continue to play a significant role in the years ahead; ATI may become a regular element of the policy toolbox, driving political business cycles in the market and the economy.

We calculate that ATI has reduced 10-year yields over the last year by roughly a quarter of a percent, providing similar stimulus as a one-point cut in the Fed Funds rate, the central bank’s primary policy tool. Combined with higher neutral rates, ATI implies the total stance of both monetary and issuance policy, considered together, is roughly neutral—in other words, ATI has interdicted the Fed’s attempt to restrain the economy, helping explain inflation persistence and upward nominal growth surprises over the past year.

If ATI is unwound via terming out \$1 trillion of excess Treasury Bills, we expect it to temporarily boost 10-year yields by 50 basis points, before settling into a permanent 30-bp increase, with corresponding price changes in risk assets. A 50-bp increase in the 10-year yield will have similar economic effects as a two-point hike in the Fed Funds rate.

If ATI is not unwound but becomes a permanently employed policy tool, we are likely to see higher equilibrium inflation and interest rates priced in over time due to political business cycles becoming reality.

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## Introduction

Over the last year and looking forward into coming years, one of the most significant but least appreciated policy innovations has been the dynamic management of the relative amounts of short- and long-term government debt auctioned by the U.S. Treasury. These policies have similar market and economic effects as the Federal Reserve's quantitative easing programs and have had major consequences over recent quarters.

Whereas Treasury has historically striven for "regular and predictable"—read: boring—issuance, recent aggressive changes to the relative levels of long- and short-term security auction sizes have made issuance irregular and unpredictable. Because Treasury is using this novel tool for managing financial markets and through them, the economy, we dub it "activist Treasury issuance," or ATI.

Investors have finite ability to absorb interest rate risk, so increased Treasury issuance of medium- and long-term debt raises interest rate levels and through them affects the broad array of financial markets. By deviating from long-standing practice and tilting issuance toward short-term bills and away from duration-bearing notes and bonds, ATI mimics the effects of the Fed's so-called quantitative easing (QE) programs, which work primarily via Fed purchases of Treasury notes and bonds.

ATI serves as a stealth form of QE, delivered by Treasury. QE functions by hiding bonds and interest rate risk away on the Fed's balance sheet, and ATI functions by limiting the creation of bonds and interest rate risk at the source, instead skewing Treasury issuance toward short-term bills.

Drawing on several strands of the empirical economics literature—studies of monetary policy, asset pricing, and fiscal policy—we calculate the size of stealth QE provided to date as roughly \$800 billion, equivalent in economic terms to about 1 percentage point of cuts to the Federal Funds rate. In other words, since the Fed stopped hiking in mid-2023, ATI has provided a meaningful amount of liquidity accommodation which has supported financial markets and nominal growth.

Combined with neutral interest rates creeping higher, we calculate that ATI-induced accommodation has loosened the combined stance of monetary and issuance policy such that total policy is just about at neutral levels. In other words, contrary to the Fed's insistence that monetary conditions are quite restrictive, they are not, and Treasury's issuance policies help explain the persistence of inflation and strong economic growth.

Treasury's highly unorthodox forward guidance to heavily rely on bill funding "for several quarters" sets up an unattractive problem for whoever is in charge at 1500 Pennsylvania after the election: the need to term out all those bills into duration-bearing coupon securities. By early next year, we expect Treasury to be sitting on a pile of roughly \$1 trillion of excess bills, and in order for Treasury to hit its debt composition targets, it will have to replace these maturing short-term bills with new intermediate- and long-term coupon debt.

When the market begins to look forward to this term out and the accompanying normalization of issuance policy, we expect it to temporarily raise long-term debt yields by 50 basis points, before reverting down to a more permanent increase of around 30 basis points—enough to cause some material changes in risk asset pricing, but hardly a financial crisis. A 50-bp increase in the 10-year yield will have similar economic effects as a two-point hike in the Fed Funds rate. The timing issue is complicated by the impending reinstatement of the debt limit on January 2, 2025.

There is every reason to expect that once one political party begins using ATI to stimulate the economy into election season, it may be used repeatedly by all future administrations. Regular use of ATI to stimulate economies in advance of elections will drive political business cycles of the type described in Alesina, Roubini and Cohen (1997), with attendant upward pressure on inflation and interest rates.

The remainder of this study is structured as follows: We first review how Fed QE works, and we show how ATI can replicate the effects of QE in markets and the economy. We then estimate the size of ATI-driven stealth QE and attempt to translate it into equivalent rate cuts for evaluation of the stance of combined monetary-issuance policy. Finally, we discuss the market effects of the outlook for future issuance, and address potential questions or criticisms of the ATI framework.

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**ATI-induced accommodation has loosened the combined stance of monetary and issuance policy.** Contrary to the Fed's insistence that monetary conditions are quite restrictive, they are not, and **Treasury's issuance policies help explain the persistence of inflation and strong economic growth.**

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## Review of Quantitative Easing

To understand ATI, it is necessary to review the Federal Reserve's so-called large-scale asset purchases (LSAPs, referred to in markets as QE). LSAPs rely on purchasing longer-term government debt to move the economy in ways purchasing shorter-term government debt will not. The reason for this distinction is that bills are "money-like" in that they are short-term instruments with almost no interest rate or credit risk, as treated in Greenwood and Vayanos (2014) and Greenwood, Hanson and Stein (2015). The money-likeness of bills makes them a close substitute with money or bank reserves, so that swapping short-term bills for money in savers' portfolios leads to only modest differences in economic constraints.

The money-likeness of bills has grown in recent decades. Before 2008, base money was the zero-yielding liabilities of the central bank, currency or reserves, and the bank regulatory system was focused largely on reserve requirements. However, after the Global Financial Crisis and the attendant LSAPs, the Fed began remunerating reserves, and the yield on reserves and Treasury bills became similar. Further, Dodd-Frank and the Basel process transitioned the bank regulatory framework from a focus on reserve requirements to a focus on capital ratios, in which bills now received similar treatment to reserves. In addition to bearing similar duration and credit profiles to reserves at the Fed, bills now offered similar yield and regulatory profiles as well. The economic substitutability between bills and reserves became greatly enhanced. Bills are not part of base money, but they are quasi-money.

By contrast, the significant interest rate risk and vulnerability to price changes inherent in medium- and long-term government debt (called "coupons") make them less money-like, requiring specific clienteles of holders willing to bear that risk. When the price of interest rate risk experiences a shock (for instance, because the Fed is engaging in a LSAP), this clientele will substitute into or out of better rather than poorer substitutes for duration-bearing coupons; because bills are nearly risk-free, bills make poor substitutes for a clientele that wants interest-rate risk and associated returns. The lack of substitutability between longer-term debt and money results in meaningful economic consequences when government reduces or increases the supply of longer-term debt.

A thorough discussion of unorthodox monetary policy is given in Bernanke (2020), but for our purposes, we emphasize two primary channels through which QE is thought to work:

- 1) Portfolio balance channel: by changing the amount of duration held by the market, the Fed can push people out the risk curve. The Fed bids up long-term Treasury debt, which leads holders of Treasury notes and bonds to sell them and buy something riskier instead, like corporate debt. Then the price of credit in turn moves higher, and holders of credit sell and buy something riskier, like stocks. Fed money first appears in the Treasury market but flows out the risk spectrum. Financial conditions ease and create more economic activity through wealth effects, cheaper access to funds, increased investment, and so forth.

- 2) Money supply channel: by changing the amount of money or bank reserves in circulation, the Fed can affect nominal growth (this is a form of monetarism).

Most economists find the first channel easier to account for, since the velocity of money whips around, making monetarist relationships unreliable for forecasting. The core insight of the portfolio balance channel is that as the Fed removes interest rate risk from investors' portfolios by buying duration-bearing Treasury securities, those investors have additional capacity to take on additional forms of risk. Additional risk appetite feeds through into higher nominal growth.

Right now, the Fed is letting some bonds mature off its balance sheet, called quantitative tightening because it reduces rather than expands the Fed's balance sheet. At its May meeting, the Fed announced that it would reduce the amount of bonds allowed to mature from a run-rate of \$60 billion in Treasuries per month to \$25 billion, starting in June.<sup>1</sup>

## ATI as Stealth QE

If the main levers the Fed pulls when engaging in QE are manipulating the levels of bank reserves (money) and duration held by the public, then Treasury can do this as well.

Consider for instance Treasury's most recent Quarterly Refunding Announcement:

Treasury expects to borrow \$847 billion of new money from the public in the third quarter. Treasury has indicated it will issue \$1100 billion of gross coupons<sup>2</sup>, and with approximately \$650 billion of redemptions, this implies net new coupon issuance will be \$450 billion. The gap to \$847 billion must be made up by net new bills, in turn implying approximate net new bill issuance of \$397 billion, or 47% of all money raised.<sup>3</sup>

Normally, Treasury would borrow 15% to 20% in bills, and the rest in coupons. The deviation from the 15% to 20% range is ATI. If Treasury borrowed 18% of its funding in bills, instead of 47%, it would require issuance of \$245 billion additional coupons.

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Whereas QE works by removing interest rate risk from the market and hiding it away on the Fed's balance sheet, **ATI works by limiting the production of interest rate risk at the source.** The net effect, however, is similar.

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In this sense, the \$245 billion of missing coupons is a form of stealth QE over the quarter that provides many of the same liquidity consequences as Fed-driven QE. Whereas Fed QE removed coupons from circulation to depress long yields and loosen financial conditions, ATI in this example has been used to reduce coupon issuance to prevent an increase in long yields and a tightening of financial conditions that would help control inflation.

Taking into account information from the Federal Reserve regarding slowing the pace of its QT program that was released after the refunding announcement, the actual borrowing needs and bill issuance will be a bit lower; see Table 2 below, which incorporates new information from the Fed.

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1 The Fed intends to keep the cap on maturing mortgages at \$35 billion per month but due to reduced prepayments actual reductions are running far below this cap. See <https://www.federalreserve.gov/newsevents/pressreleases/monetary20240501a.htm>

2 Treasury securities one year in maturity and shorter are called bills, and sell at a discount to par value, so that the interest is paid via redemption at par. Securities longer than one year (effectively starting with two-year notes) are sold at par, and pay a fixed coupon remittance twice a year, and are called coupons.

3 This discussion example excludes the Fed's announcement of reductions to its QT program, which occurred subsequent to the May QRA. The Fed's new policies are included in our calculations below.

## How ATI Drives Liquidity and Financial Conditions

ATI works through the same channels as QE, but with some subtle differences:

- 1) Portfolio balance channel: because of market structure, the market has a fixed amount of overall risk it can absorb. If Treasury were to issue a significant amount of duration risk, it would induce investors to sell other assets to buy bonds, since interest rate risk would displace investors' tolerance for other kinds of risk. Treasury is a price-insensitive, inelastic seller whose sales are essentially dictated by Congress and issuance policy, whereas market participants are elastic buyers and sellers who transact only at prices they deem attractive. If Treasury will sell debt regardless of clearing yields, the market-clearing yield is that which induces buyers to sell some other asset to buy Treasury debt.

In a reversal of the QE portfolio balance, higher coupon supply pushes Treasury yields higher, which induces credit holders to sell credit and buy Treasuries. Wider credit spreads then induce equity holders to sell equities and buy credit. Term premia increase, and since risk premia on other assets are priced relative to long yields, they would widen. All else equal, an increase in the ten-year yield would push mortgage rates up, stocks down, and so forth. Economic activity slows as risk-taking appetite is reduced, called "crowding out" in the fiscal policy literature.

- 2) Money supply channel: there are two pathways for money supply to affect financial conditions and growth, and they both rely on the fact that bills and cash deposits (bank reserves) are close substitutes (both are short-term, interest-bearing assets with little counterparty or interest rate risk), while bank reserves and coupons are not. In other words, bills are more money-like than coupons.
  - First, consider that when Treasury issues a security, it corresponds to a drawdown in bank reserves; someone sells a bank reserve to buy a Treasury bill or coupon. Because bills and reserves are close substitutes but coupons and cash are not, swapping bills for reserves causes a much smaller reduction in effective money supply than swapping coupons for reserves. Just as reserves can be used by banks to extend loans, bills can be leveraged in repo transactions to extend credit. Coupons require deeper haircuts, since the collateral implies risk.
  - Second, since the Basel process forced the Fed to adopt an "abundant reserves" rather than "scarce reserves" monetary framework like it used prior to the Global Financial Crisis, the Fed uses its Reverse Repo Facility (RRP) to keep the Fed Funds rate in its target range. The RRP balance at present is roughly half a trillion dollars, down from a high of about \$2.5 trillion in late 2022. Increased bill issuance has had the effect of draining RRP rather than bank reserves. RRP is relevant because the balances are mostly held by money market funds, and money fund balances are also close substitutes for money because they can fund transactions (people write checks on their money market funds). When bill issuance by Treasury drains RRP balances instead of reserves, it merely shifts the private sector's allocation among several close substitutes of money rather than reducing the money supply. If bank reserves are "money" and both bills and RRP are very money-like, shifting allocations among these three will have much less effect on the economy than a reduction in money balances in favor of a non-money-like asset like long bonds.

Driving both channels is that when a financial institution sells \$1 of bank reserves (or RRP) to buy \$1 of T-bills, its overall financial position and ability to lend into risky activities is little changed from either a profit-maximizing or regulatory perspective. However, when that institution sells \$1 of reserves (or RRP) to buy \$1 of a 30-year bond, its financial position is much changed, and it will have a significant amount of interest rate risk. That interest rate risk may reduce its ability to tolerate other risky assets (portfolio balance) or it may reduce its ability to lend into the economy, because the duration-bearing Treasury securities cannot be leveraged as easily as bills (via repo) or reserves (via lending) for both market and regulatory reasons.



Although academics and policymakers have little discussed the channels through which ATI affects the economy, market practitioners have developed frameworks for investing based on it, for instance Constan (2022, 2023): “the [policy] transmission mechanism IS coupon supply.” Whereas QE works by removing interest rate risk from the market and hiding it away on the Fed’s balance sheet, ATI works by limiting the production of interest rate risk at the source. The net effect, however, is similar.

There is another instrument of ATI that we do not focus on in this paper, which is manipulation of the size of Treasury’s General Account (TGA) at the Federal Reserve, which is essentially the government’s checking account. If Treasury decides to boost the size of TGA by raising issuance, it means money flows out of the private sector banking system and into government coffers, implying a reduction in private sector money supply and increased issuance needs. If Treasury decides to spend down TGA, it reduces issuance needs and boosts money supply. Manipulating the size of TGA works through the same channels of money supply and interest rate risk, but by changing the total amount of borrowing rather than the borrowing split among bills and coupons.<sup>4</sup>

Moreover, increased bill issuance has brought forward the date at which the Fed decided to taper the QT program. The Fed doesn’t know the levels at which reserves transition between abundant, ample, and scarce, so it wanted to slow the pace of reserve reduction when the RRP balance is small, to reduce the chance it accidentally sets off problems in short-term funding markets as it did in the last tightening cycle. The Fed explicitly tied the taper of QT to declining RRP balances,<sup>5</sup> ceding the timing of the QT taper to Treasury via the latter’s control of bill issuance.

After slowing QT, the Fed will roll over a greater amount of maturing coupon bonds from Treasury and the public will have to absorb less new issuance. The result, of course, is looser financial conditions.

Comparison of QE and ATI		
	QE	ATI
Transaction	Fed buys intermediate- and long-term debt, creates overnight reserves (money)	Treasury auctions less intermediate- and long-term debt, auctions more short-term bills (quasi-money)
Portfolio Balance Channel	Fed removes interest rate risk by placing it on Fed balance sheet	Treasury reduces creation of interest rate risk at issuance
Money Supply Channel	Fed increases money supply by creating bank reserves	Treasury prevents reductions in effective money supply because bills are a close substitute for bank reserves
Bond Market Effects	Bond prices are higher than they otherwise would be	Bond prices are higher than they otherwise would be
Risk Asset Effects	Other asset prices are higher than they otherwise would be	Other asset prices are higher than they otherwise would be
Political Economy Framework	Politically independent (in principle) central bank managing the business cycle via financial markets	Politically dependent Treasury officials managing the business cycle via financial markets

Table 1: Comparison of QE and ATI

4 Moreover, because the Fed does not pay interest on TGA but Treasury pays interest on issuance used to fund it, TGA balances imply unappropriated and opaque transfers from taxpayers to the Fed. That arrangement was inconsequential when the Fed remitted operating profits back to Treasury, but while the Fed is incurring large operating losses, it has become problematic.

5 <https://www.bloomberg.com/news/articles/2024-01-06/logan-says-fed-should-slow-asset-runoff-as-reverse-repo-dwindles>

Finally, there is historic precedent for the purposive manipulation of liquidity and financial conditions via ATI. The Federal Reserve’s 2011 “Operation Twist,” whereby it sold short-term Treasury securities and purchased long-term Treasury securities, was named after an earlier Operation Twist executed by the Treasury Department during the Kennedy Administration. As recounted in Alon and Swanson (2011), the goal of the original Operation Twist was to lower long yields to stimulate the economy while maintaining elevated short yields to halt gold outflows. The original Operation Twist was a collaboration between the Fed and Treasury whereby Treasury increased its issuance of short-term debt and the Fed offset the new borrowing by buying long-term debt. This example was an early use of creative issuance policy to achieve unorthodox economic goals.

## The Size of Treasury’s Stealth QE

### Treasury’s Target Bill Share

Treasury has targeted 15%-20% as the share of outstanding debt in bills since 2020. To continue our comparison with monetary policy, the bill share is analogous to a target for overnight interest rates. One might also consider targeting the weighted average maturity (WAM) of the debt, just as a central bank might consider targeting money supply instead of overnight rates. See below subsection “Focus on WAM” for a discussion of why we believe WAM an inferior measure of Treasury’s issuance effects.

Over the years, the target share of debt issued in bills has varied with evolving market structure driven by the rise and fall of different investor bases and changes to the regulatory environment. The bills target is set in consultation with the Treasury Borrowing Advisory Committee (TBAC), comprised of significant participants in the Treasury market, who are able to advise Treasury of shifts in demand among different investor clienteles.

For instance, the long-term average is 22.4%, but in the years after the GFC, the share of bills was close to 10% as demand for long-duration securities was very high due to persistently low global growth and inflation (Figure 1).

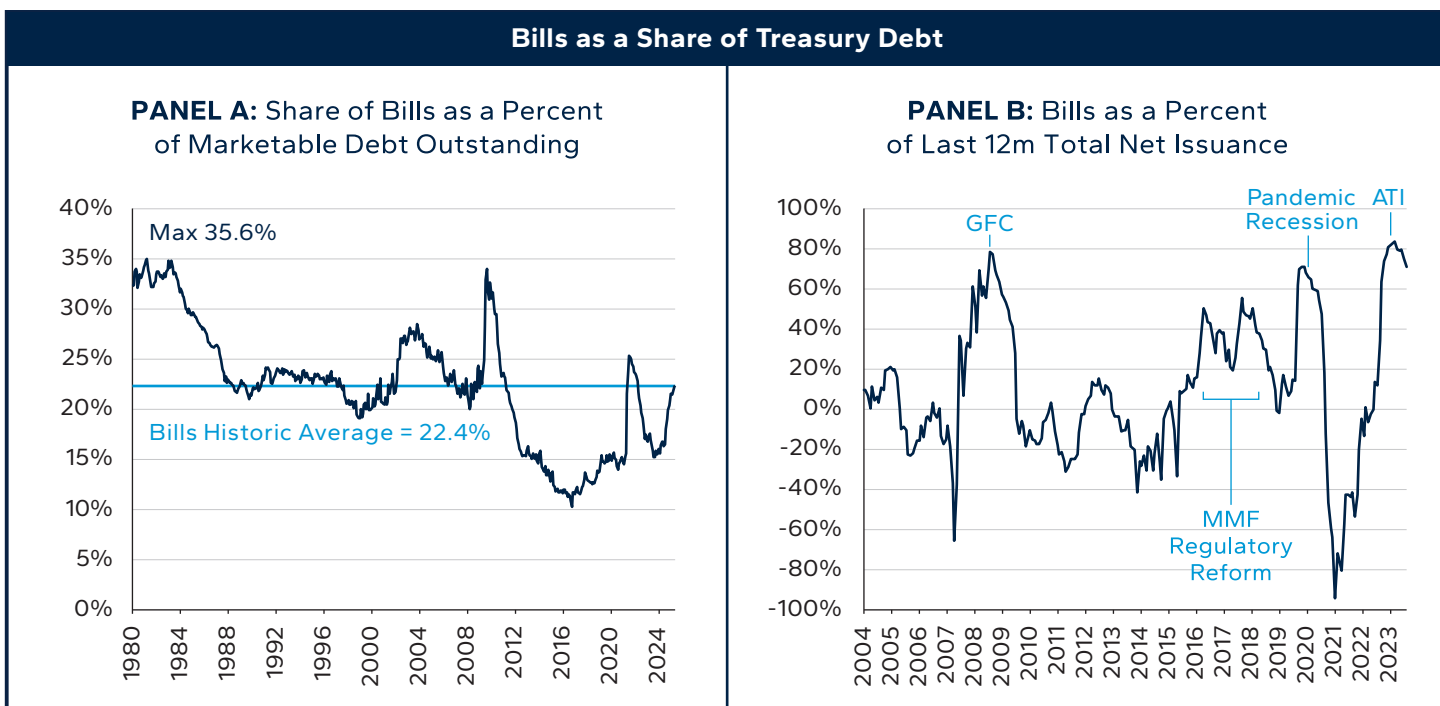


Figure 1 Panel A: The share of bills in outstanding Treasury securities over time. Source: U.S. Treasury (2024a). Panel B: Bills as a share of net new marketable issuance over the last 12 months. The four periods of high bill issuance: the Global Financial Crisis, in which funding needs spiked due to recession; 2016-2018, in which Treasury raised the bill share to accommodate stronger demand from money market funds; the pandemic recession, in which funding needs spiked due to fiscal support; and the period of ATI, 2023-present. Source: U.S. Treasury, SIFMA.



In 2015, Treasury decided to increase the share of bills to 15% due to a variety of regulatory changes boosting demand (U.S. Treasury, 2015). For example, new regulations for the money market fund (MMF) industry prohibited non-government institutional (“prime”) MMFs, which invest predominantly in short-term corporate paper and therefore bear credit risk, from pegging net asset value to \$1.<sup>6</sup> The result was the outflow of the majority of prime MMF assets into government-only MMFs, which invest mostly in bills (Figure 2). Treasury decided to accommodate the regulator-driven surge in demand for bills by increasing supply.

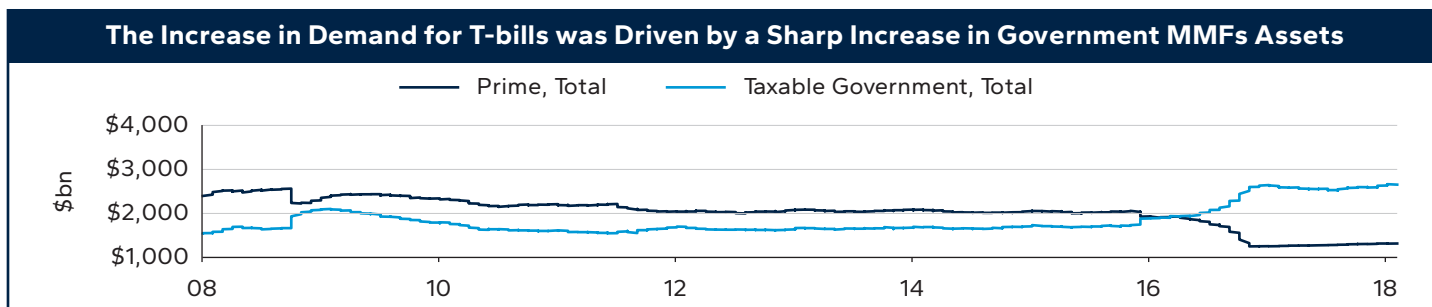


Figure 2 Regulatory changes to the money market fund industry drove demand for T-bills by creating migration of assets from the non-government to government sectors of the MMF industry. Source: U.S. Treasury (2020).

In 2020, Treasury again decided to increase the stock of bills to a target range of 15% to 20%, this time to provide more flexibility for issuance in the face of funding spikes due to potential future pandemic-related fiscal stimulus as well as to offset targeted maturity extensions in the universe of coupons while preventing too big an increase in the overall average maturity of the debt (U.S. Treasury, 2020).

In none of these cases was Treasury’s motivation for changing the bill share management of the business cycle or timing the interest rate cycle with respect to issuance. Indeed, Treasury’s principles for debt management prohibit trying to time the interest rate cycle, but rather focus on creating long-term policies for minimizing interest expenses secularly (U.S. Treasury 2024b, also [see below section on potential criticisms of the ATI view](#)).

It is important to understand that even though the stock of debt in bills may vary by only a few percentage points, that can have substantial effects in markets, because the size of the debt is so large. With \$27 trillion marketable debt outstanding (and rising), it takes less than a four-point swing in the bill share to cause a market flow in excess of \$1 trillion, in line with a moderately-sized QE program. And as Figure 1 makes clear, it only takes small changes in the bill share of the stock of outstanding bills to generate substantial variation in the share of bills as a percentage of net new issuance.

### Deviations From Target

The stealth QE achieved by ATI is the “missing” coupons that would be issued if Treasury stuck to its guidelines of 15% to 20% bill issuance. Such policy is “activist” because it deviates from rules, in the same way monetary policy is considered activist.

Because QE, like all policy actions, becomes priced into forward-looking markets going into and at announcement, we use the Treasury’s auction guidance tables released at every refunding round to produce the following analysis: we first estimate the amount of net bills Treasury will need to sell each quarter and calculate the implied bill share of overall issuance. We then calculate the missing coupons as the deviation of the bill-share from Treasury’s target range of 15% to 20%. The missing coupons are the dollar value of bills deviating from the target.

<sup>6</sup> These regulations were driven by a desire to avoid MMFs from unpegging NAV from \$1 and thereby “breaking the buck,” which regulators fear could cause or worsen a financial crisis. Because corporations can default on short-term paper but (in theory) Treasury cannot, prime MMFs were forced to move to floating NAV. Customers use MMFs as substitutes for savings accounts, so they preferred the fixed NAV even if it bore lower yields, and migrated assets to government-only MMFs.

Because ATI and QE both work through the amount of interest rate risk and effective money supply Treasury and the Fed place in market circulation, all numbers refer to net issuance of new Treasury securities unless otherwise stated. Gross issuance inclusive of rolling over maturing debt doesn't result in a change in the amount of interest rate risk owned by the public.<sup>7</sup>

## Missing coupons in just three calendar quarters of ATI are in excess of \$800 billion. ATI's effects are similar to the Fed's QE.

Our estimate is conservative insofar as it benchmarks to Treasury issuing 18% bills when in fact it should be issuing well below 15% to return to the 15% to 20% reference range more quickly. If Treasury issued 15% bills instead of 18%, the figures would be approximately \$100 billion higher.

Estimated Missing Coupons					
Line	Formula	(billions of \$)	2023 Q4	2024 Q1	2024 Q3
1		Bills	\$ 513	\$ 468	\$ 285
2		Total financing need	\$ 852	\$ 816	\$ 847
3	(1/2)	Bill share	60.2%	57.4%	33.6%
4	3 - 18%	Bill share deviation from target	42.2%	39.4%	15.6%
5	4 * 2	<b>Missing coupons</b>	<b>\$ 360</b>	<b>\$ 321</b>	<b>\$ 133</b>
6	sum(5)	<b>Total</b>			<b>\$ 813</b>

Table 2 Source: US Treasury, HBC calculations. Because of seasonal dynamics with deficits, there was no need for large bill issuance in Q2 of 2024. 24Q3 adjusted by HBC to reflect the revised path of Fed SOMA reductions. Numbers reflect issuance net of rolling over maturing debt.

Our calculations indicate the value of missing coupons in just three calendar quarters of ATI is in excess of \$800 billion. ATI-provided accommodation works through very similar channels to QE.

Moreover, guidance for Q3 of 2023 was that 76% of net issuance would be bills, implying an additional \$423 billion of missing coupons beyond our baseline calculation. We don't include those in the table since raising new money mostly in bills during a spike in funding needs is not unreasonable, and the wake of the debt limit suspension left a spike in funding needs. It is the subsequent failure to term these bills out and return to regular and predictable issuance patterns on which we focus. However, there are good reasons one might include the additional \$423 billion in missing coupons from 2023 Q3 in ATI: the spike in funding needs wasn't due to an event that would upset financial conditions, like a recession or a war, that we typically think of as justifying bills finance. Instead, the spike was due to peculiarities over the debt limit, the nation was at peace, inflation was far too high, financial conditions were easy, the economy was growing well above potential, and markets most likely could have absorbed the additional issuance. We choose not to include it for sake of being conservative.

Because of seasonal variations in financing needs, Treasury engaged in no ATI in the second quarter of 2024—there was no need to artificially reduce coupon issuance because overall borrowing needs are quite low during tax season.

<sup>7</sup> What matters economically is new issuance, net of redemptions. When Treasury rolls over maturing debt, a saver receives dollars for a maturing bill or coupon security and then trades those dollars for a new bill or coupon security. Rollovers have no meaningful economic difference, since the saver owned a bill or coupon both before and after the rollover. Because most Treasury securities are held in portfolios managed to a particular mandate—a government fixed income portfolio or sleeve indexed to the maturity structure of outstanding debt in a given sector of the yield curve—most maturing securities are in fact replaced with new issues by the same saver.

To see ATI's effect on the distribution of outstanding debt, consider that the weighted average maturity of debt held by the public (private, i.e. not owned by the Federal Reserve's System Open Market Account) has trended down since Treasury began its novel issuance strategy, and is on track to decline even further. In this sense, the decline in weighted average maturity (WAM) of Treasury debt in Figure 3 is a visual representation of ATI/stealth QE.<sup>8</sup> For a lengthy discussion of WAM's drawbacks as a measure of ATI, please see the subsection "Focus on WAM" in the "Criticisms of ATI" section of this paper.

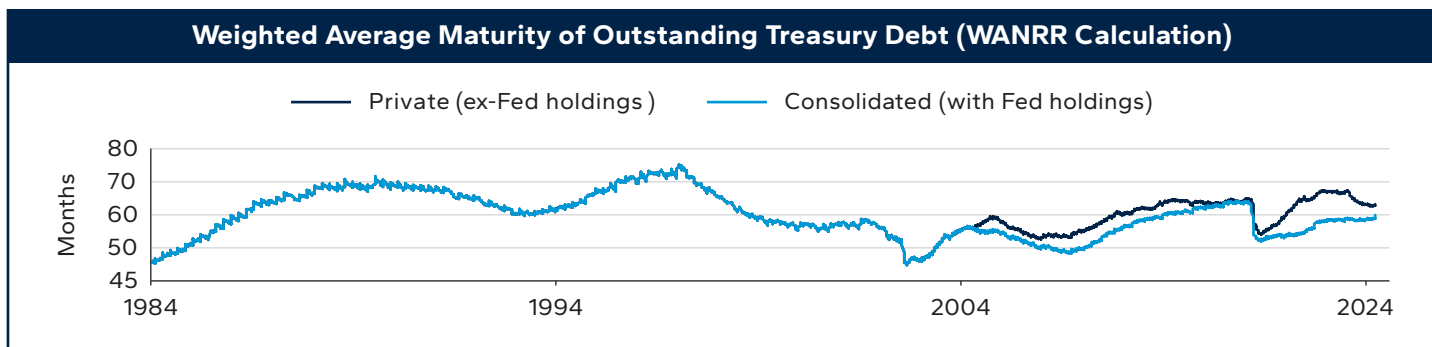


Figure 3 Weighted Average Next Rate Reset (WANRR) is a measure of the maturity of outstanding debt that adjusts for floating-rate notes. Consolidated debt adjusts for holdings in the Federal Reserve's System Open Market Account, while private debt excludes the Fed's holdings. Consolidated debt treats SOMA debt in excess of Treasury's General Account and currency as overnight debt, reflecting the Fed's shortening of the duration profile via QE. For quantifying the economic and market effects of ATI, one should use the private series, because it is flows absorbed by the public which set market prices. The decline in private WANRR in the period of ATI is roughly half the magnitude of the declines during the pandemic recession or the Global Financial Crisis. By contrast, for evaluating whether issuance policy is deviating from historic norms, one should use the consolidated series, because debt held by the Fed is still issued by Treasury. WANRR of the consolidated debt is still materially below what prevailed before Covid, evidence of ATI. For more, see the below subsection "From Treasury: Focus on WAM, not the bill share." Source: US Treasury (2024a).

## Evaluating the Stance of Combined Monetary and Issuance Policy

To contextualize the overall stance of liquidity policy, we need to convert the \$800 billion of stealth QE into something comparable to the Fed Funds rate. The question we ask is "how big a cut to the Funds rate would be required to effect the same degree of economic accommodation provided by \$800 billion of stealth QE?" To answer it, we draw on three different strands of the economics literature: studies in monetary policy, finance, and fiscal policy.

Across the three methods, it is important to have as well a mapping between changes in 10-year interest rates and changes in the Funds rate. To do so, we use the relationship simulated in the Fed's workhorse FRB/US model, reported by Laforte (2018). These simulations indicate that a 100 bp increase in the Fed Funds rate will raise 10-year yields by roughly 25 basis points.<sup>9</sup> The reason why a 25-bp increase in the 10-year yield is as powerful as a 100-bp increase in overnight rates is because more economically significant activity is priced relative to long-rates than to short rates. For instance, mortgages have similar duration to 10-year Treasuries (due to prepayment) and so mortgage rates are managed by investors as a spread to 10-year yields.

Finally, although the Fed insists that QT doesn't affect the stance of monetary policy, we believe this is plainly false. The Fed's recent reduction to its QT program should add \$140 billion to this headline number or increase the below effects by 17%, but we focus on ATI alone to isolate that channel.

8 Note that during times of severe funding stress like the pandemic, it's normal and appropriate for Treasury to fund its spiking financing needs with bills, and then term those bills out over time: this pattern is reflected in the sharp decline in the blue line in 2020, followed by its gradual increase. The increase in maturity in 2022-2023 beyond 2019 levels was due to halted issuance during the debt limit. Since the debt limit was suspended, the decline in maturity below 2019 levels has been due to excessive bill issuance, and maturity is slated to decline even further without changes to Treasury's issuance profile.

9 The mapping of a 1-point move in overnight rates to a 0.25-point move in ten-year yields is conservative, since other studies have found that it takes larger moves in overnight rates to achieve a given change in long rates. For instance, Gurkaynak et al (2005) find that a 1-point move in overnight rates leads to a 0.15-point move in ten-year yields. If we used this relationship instead, our core ATI calculations would be 67% larger, when stated in terms of Fed Funds equivalent cuts.

## Monetary Policy and LSAPs

There are two ways of applying the literature on monetary policy to changes in the issuance structure, and they diverge because economists have long debated whether LSAPs work via the daily or monthly volume of transactions—the so-called “flow view”—or via the total size of the operation, regardless of how long it is spread out—the so-called “stock view.”<sup>10</sup> While the Fed has historically inclined toward the stock view, market participants tend to use a version of the flow view in making investment decisions. The experience of the Treasury market “taper tantrum” of 2013 inclines us to side with investors that the flow view is more important, since the timing of the taper announcement was a test that provided a significant change to the flow of LSAP purchases, but only a very small change to the expected size of the Fed’s total bond holdings. Nevertheless, we pursue both approaches below, and although we think the flow view dominates, particularly in the short term, we acknowledge reality is likely somewhere in between.

To quantify the flow effect, we employ the notion of a shadow Fed Funds rate, developed by Kim and Singleton (2012) and Bauer and Rudebusch (2013). The shadow funds rate was refined for the U.S. by Wu and Xia (2013) and has been maintained by the Atlanta Fed.<sup>11</sup> The shadow rate attempts to estimate what level of the Fed Funds rate, potentially negative, is most consistent with the term structure of rates all along the yield curve, if the zero-lower bound to the Funds rate didn’t bind. In other words, if, say, 3-year and 10-year Treasury yields are at 0.3% and 0.8%, where would one expect the Funds rate be if there were no lower bound? This method of analysis has been used by Fed officials in the past to measure the effects of QE, for instance by Bullard (2012). According to the Wu-Xia model, \$120 billion per month of asset purchases from the Fed during the pandemic depressed the shadow Funds rate to -1.8%. In other words, \$120 billion monthly QE provided monetary accommodation equivalent to 1.8 percentage points of Fed Funds rate cuts.<sup>12</sup>

If \$813 billion of stealth QE is disbursed through the course of a year, it amounts to an average \$68 billion per month, or somewhat over half of the \$120 billion benchmark. Using this framework, \$813 billion of missing coupons would have the same effect as a reduction in the Fed Funds rate by 1 percentage point—a significant loosening of policy in a high-nominal growth environment and undoing all the Fed hikes of 2023.

Put differently, Treasury announcing \$800 billion *more* coupon issuance over a year would have the same effect on markets and the economy as a 1 percentage point hike in the Federal Funds rate.

Estimates of the stock effect typically approach balance sheet policies with event studies. Gagnon (2016) surveys this empirical work; the average study indicates a LSAP in which the Fed buys 1% of GDP worth of bonds reduces long rates by approximately 8 basis points. This result is within the two rules of thumb from the literature discussed in Eberly, Stock and Wright (2019) in which 1% of GDP worth of bond purchases lowers term premia by 6 or 10 basis points.

Since \$813 billion is 2.8% of GDP, term premia would be reduced by roughly 23 basis points. Combining this number with the FRB/US simulations in Laforte (2018) indicates that these results together imply that issuing an additional \$800 billion of coupon supply would have the same market and economic effects as an increase in the Federal Funds rate of 0.92%.

The calculations from the two approaches are within a tenth of a percentage point of each other.

<sup>10</sup> See, for instance, Bernanke (2010), Sack (2011) and D’Amico and King (2013).

<sup>11</sup> <https://www.atlantafed.org/cqer/research/wu-xia-shadow-federal-funds-rate>

<sup>12</sup> Technically, maybe a little more, since the effective Funds rate at the time was between 0% and 0.25%. Moreover, we are implicitly assuming that Treasury purchases and mortgage-backed security purchases have similar effects on the economy outside of a housing-centric financial crisis, which we justify by observing that the volatility in mortgage rates was smaller than volatility in the Treasury complex during the pandemic. On the other hand, one might argue the shadow rate also captured easing provided by the Fed’s forward guidance over the future course of the Funds rate, and there is some truth to that. However, as we discuss below, Treasury is also providing forward guidance on future issuance plans, and such guidance should also be considered part of ATI. In other words, disentangling these effects may be difficult, and will be a fruitful area for future work.

## Asset Pricing

Studies from the finance literature offer a benchmark against which to compare the calculations from monetary studies. Greenwood and Vayanos (2014) find a baseline estimate that a one-month extension in the weighted average maturity (WAM) of outstanding Treasury securities increases 10-year note term premia by 2 basis points (a “stock view” approach).<sup>13</sup> Per U.S. Treasury (2024), WAM of debt held by the public has declined by roughly five months in recent quarters due to changes in issuance, implying a 10 basis point reduction in term premium—roughly half the size as the LSAP-driven calculations. However, Greenwood and Vayanos run an alternate specification excluding bonds held by the Federal Reserve and find an effect that is 43% larger, which would imply a change in term premia of 14 basis points.<sup>14</sup> Because ATI works through securities that must be absorbed by the public and not the Fed, we prefer this specification from their study. For perspective, recall that above our calculations from the monetary policy literature implied a change in term premia of 23 basis points.

The Greenwood and Vayanos approach has been extended by Hou (2018), who studies the effect of changing WAM of new issuance in periods in which the correlation between stocks and bonds is positive, because shifts in the correlation between stocks and bonds indicate significant changes in the demand structure for fixed income. Because Hou focuses on the WAM of issuance rather than all outstanding bonds, he implicitly adopts a “flow view” approach. Hou finds that a one-year extension of the maturity of new issuance increases term premia by  $1.6\rho$ , where  $\rho$  is the correlation between stocks and bonds. Using the post-Covid correlation of 0.25,<sup>15</sup> a one-year change to the WAM of new issuance is associated with a 40-basis point increase in term premia. Given the decline in new issuance WAM during the period of ATI has been roughly a year, the expected effect on term premia is around 40 basis points, somewhat larger than the monetary policy-driven calculations.

## Fiscal Policy

Finally, studies of the effect of fiscal policy on interest rates typically examine the relationship between ten-year yields and the debt/GDP ratio, or sometimes the deficit/GDP ratio. In general, these studies are much worse identified than the studies of monetary policy and we are therefore more skeptical of their results. In particular, data about deficits come out with much lower frequency, making it difficult to isolate deficit news in an examination of market behavior. Fiscal policy is driven by and produces changes in economic outcomes that extend beyond simple investor tolerance for duration risk, because tax rates and government expenditures are move in in concert with other factors. Identification problems can be so bad that some fiscal studies, like Belton et al (2018) on the effects of Treasury supply on interest expenses, use the monetary policy literature instead.

However, ignoring these concerns for the moment, the array of results is not inconsistent with our calculations above—to match our expected effects from studies of monetary policy, interest rates should increase around 8 basis points per point of debt.

An expansive survey of the fiscal policy literature by Engen and Hubbard (2004) indicates that a one-point increase in the debt/GDP ratio increases 10-year rates by 3 basis points, a much smaller effect.

However, more recent studies find larger effects: for instance, Greenlaw, Hamilton, Hooper and Mishkin (2013) estimate 4.5 basis points per point of debt, but that the effect accelerates rapidly with large debt ratios and current account deficits. Plugging in the present U.S. debt and current account deficit (121% and 3%) into their results<sup>16</sup> yields an increase of 7.1 basis points per point of debt.

13 This is an interpolation of their results for 5-year and 20-year term premia; they do not present results for 10-year term premia.

14 We are hesitant to rely too heavily on this specification because it uses a different independent variable (the share of total interest and principal payments longer than ten years out) rather than WAM, so it is less straightforward to compare to monetary policy innovations.

15 The one-year correlation coefficient for daily returns between the Bloomberg U.S. Treasury index and the S&P 500 has varied between 0.2 and 0.3 for most of the inflationary episode since 2022 and currently sits at 0.28.

16 Equation 18 in their paper.



Cotton (2021) finds that a one-point increase in the debt/GDP ratio raises 10-year rates by 8 basis points. Laubach (2009) finds that a one-point increase in the expected deficit/GDP ratio raises 10-year interest rates by 25 basis points, but smaller effects for increased debt/GDP ratios, around 4 basis points. Dai and Philippon (2005) find larger effects, estimating 40-50 basis points per point of deficit/GDP.

We are inclined to weight studies from the fiscal policy literature much less heavily for this analysis, but we mention them for thoroughness.

### **Event Study of QRA of August 2, 2023**

To these analyses we can add our own examination of the refunding announcement of August 2, 2023, which set in motion the market's view that Treasury would have to begin down the path of large-scale coupon issuance. The Kim and Wright (2005) estimate of the term premium on ten-year bonds, as calculated by the Fed Board, increased from -0.21% on August 1, 2023 to 0.35% at the end of October, before the November QRA quelled expectations for increased coupon issuance in the future.<sup>17</sup> The net increase was 56 basis points.

What was the corresponding increase in market expectations for coupon supply? It's impossible to be scientific about that question, but per our calculations above, there were roughly \$423 billion of missing coupons in Q3 of 2023 and an additional \$813 billion over the following year, for a total of about \$1.25 trillion.<sup>18</sup> If all the increase in term premium was due to supply concerns and this effect scales linearly, these numbers imply an \$800 billion-sized ATI would prevent a 36-basis point increase in term premium, modestly larger than our baseline calculation but in line with the calculations derived from Hou (2018).

### **Combined Monetary and Issuance Policy are Not Restrictive for the Economy**

Looking at the array of methods above for mapping changes in issuance patterns to changes in Fed Funds rates, the broad range of plausible outcomes appears to be that Treasury's actions reduced term premia by between 14 and 40 basis points, with a central guess around 25 basis points.

Combining these calculations with the results in Laforte (2018), this translates into an equivalent range of Fed Funds rate cuts of between 50 and 160 basis points, with a central guess at 100 basis points.

To evaluate policy comprehensively, we need a notion of neutral rates—so-called  $r^*$ —at which monetary policy is neither stimulative nor restrictive; rates above  $r^*$  are restrictive, and below accommodative. In particular, because we are interested in the question of how restrictive the Fed is at present, we rely on a notion of  $r^*$  that relates to short-term neutral rates given current inflation, rather than a long-term notion of  $r^*$  that relates to the terminal rate in the next cutting cycle once the Fed has returned inflation to target and the economy is operating at potential. For a fulsome discussion of differences between short- and long-term neutral and natural rates, see Platzer, Tietz and Linde (2022).

Although the Fed still conceives long-term real neutral rates near 80 basis points,<sup>19</sup> numerous studies have pointed to higher neutral rates at the very least in the short term if not for the longer term. Gerber and Miran (2024) argue that neutral rates will remain higher for a sustained period, and a survey of estimation methods in Benigno et al (2024) indicates the real neutral rate has risen to about 1.5%. On Wall Street, Gapen (2024) and Mericle and Abecasis (2024) estimate real neutral rates could be even higher than 1.5%, and the five-year yield on inflation-protected Treasury securities five years forward, often conceived as the market indication of real neutral rates, has been hovering around 2% for almost a year. Former New York Fed President Bill Dudley (2024) has also argued  $r^*$  could be as high as 2%.

<sup>17</sup> <https://fred.stlouisfed.org/series/THREEFYTP10>

<sup>18</sup> As discussed above, we don't consider Q3 of 2023 to be activist but rather to be classic tax smoothing behavior of funding spiking deficits with bill issuance, so we don't include it in our own calculations attributing accommodation to ATI. Nevertheless, for the purpose of the event study, we include it, because the market responded to it.

<sup>19</sup> <https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20240612.pdf>



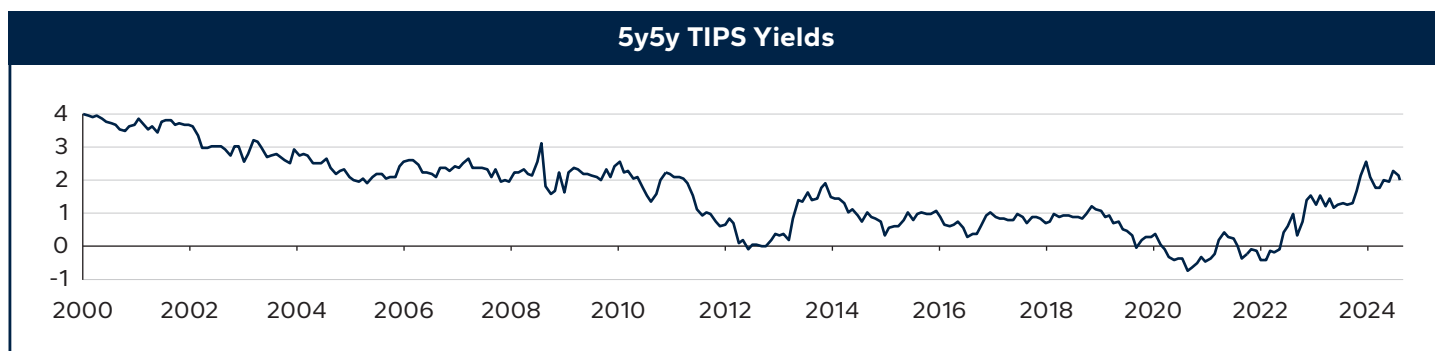


Figure 4 Five-year inflation-protected Treasury yields, five years forward: a measure often interpreted as market estimates of neutral rates. Source: Bloomberg.

If real neutral rates are 1.5% and inflation is 3%, the nominal neutral rate at present will be around 4.5%. The nominal policy rate is currently 5.3%. Subtracting 1% worth of ATI-provided accommodation and adding back 0.5% from the Fed’s ongoing QT operations<sup>20</sup> puts effective combined policy at 4.8%, a hair above neutral. If the real neutral rate is instead in line with market indications at 2%, then effective combined policy is a hair below neutral.

In other words, the Fed is barely exerting any restraint on the economy, if any at all, despite its insistence that policy is quite restrictive.<sup>21</sup> Policy is effectively roughly neutral. ATI is blocking the Fed’s attempts to restrain the economy and return inflation to target.

## Evidence of ATI

The backdoor rate cuts provided by ATI via the loosening of liquidity conditions help explain why financial conditions have been so lax, with stock markets booming and corporate credit at times trading at minimal spreads to Treasuries, despite the high nominal interest rate and deficits.

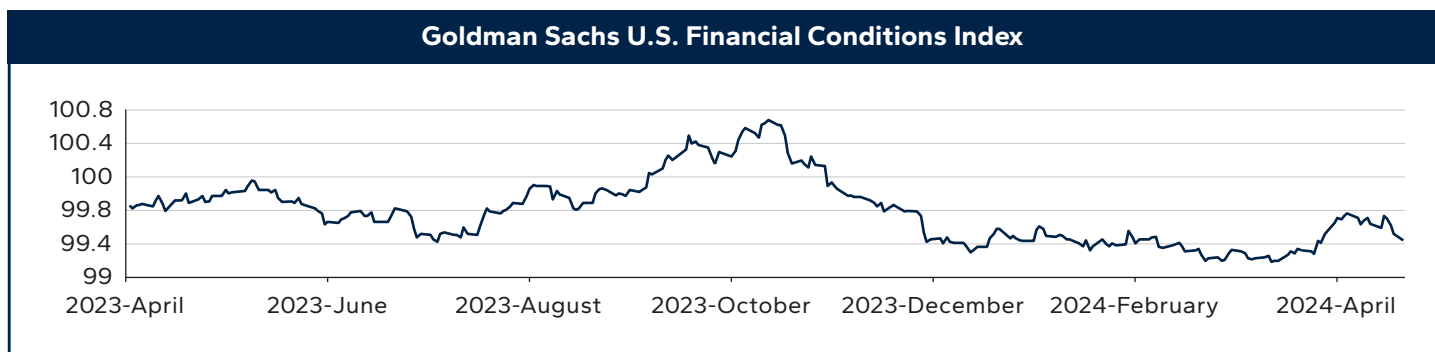


Figure 5 Financial Conditions Index. Lower levels reflect looser financial conditions. Source: Goldman Sachs, Bloomberg.

Meanwhile, for monetarists, what matters is money supply, determined by the Fed’s provision of reserves to the banking system. The Treasury’s sterilization of QT’s money supply reduction has been so effective that bank reserves have largely gone sideways over the period in which the Fed has engaged in QT. In this sense, the reduction in money supply has been offset by Treasury’s draining of the RRP.

## Backdoor rate cuts provided by ATI help explain why financial markets have been so buoyant.

<sup>20</sup> The Fed is redeeming \$25 billion per month from their Treasury holdings maturing, and roughly \$15 billion per month from their agency bonds. Using the same flow view method for translating QE/QT into Fed Funds equivalents, this is probably about 0.5% of Fed Funds restrictiveness.

<sup>21</sup> <https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20240501.pdf>

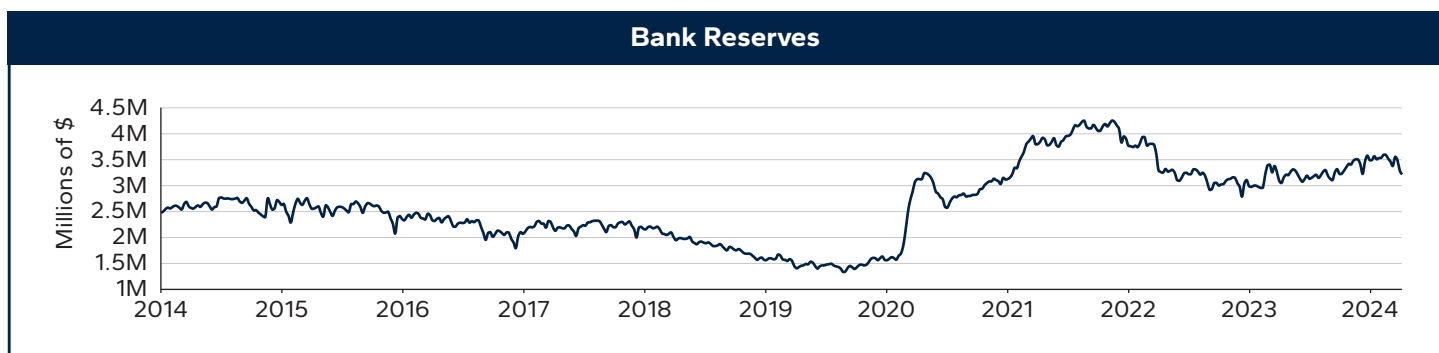


Figure 6 Reserve balances held by U.S. banks. Source: Federal Reserve.

In turn, the booming liquidity conditions have helped fuel economic growth. Real final sales to private domestic purchasers, a measure of GDP growth that strips out volatile inventories and exports, has grown near 3% for three consecutive quarters, which hasn't happened since the immediate aftermath of the pandemic in late 2020 and early 2021.

As argued extensively in Gerber and Miran (2024), it is difficult to argue that monetary policy is restrictive in light of such torrid nominal growth numbers. The countervailing actions of Treasury and the stimulus provided via its changing debt patterns help explain why.

## Market Narrative of ATI Effects

Interpreted through this lens, we can make sense of market dynamics for the last year as functions of Treasury term premia. Term premia, or the additional compensation investors demand to hold Treasury bonds with interest rate (duration) risk, as opposed to bills, like everything else in economics depend on both supply and demand. When Treasury increases supply of duration risk, prices go down, pushing yields (and term premia) up. Because Treasuries are the “risk-free” or benchmark asset in the economy, all other assets are priced relative to Treasuries. That includes risk premia priced into equities, via the price-earnings multiple investors pay for stocks. In other words, higher Treasury yields as a result of increased bond supply can push stock market prices down. Interpreted through this lens, we can say the following:

**Spring 2023 Debt Limit Showdown** — Treasury stops auctioning new debt due to the debt limit and draws down its various savings accounts. This combination is a large effective liquidity injection (less duration supply, more private money creation as Treasury deposits are spent down and converted into private deposits). Markets perform very well (with the exception of volatility from Silicon Valley Bank, quickly passed).

**Debt Limit is Suspended June 4, 2023** — Treasury issues vast quantities of bills to rebuild its cash buffers. No meaningful changes to market conditions, since bills and cash are close substitutes.

**August 2, 2023** — QRA indicates Treasury is not only going to borrow massively to fund a rapidly widening deficit, but that it will begin gradually terming out the bills it just issued into coupons. Term premia start expanding as the market realizes the amount of duration supply coming online is going to be extensive and spends three months extrapolating the increase in duration supply. Risk assets suffer for three months as a result as the yield curve bears steepens.

**November 1, 2023** — Treasury announces it will hold the amount of coupon supply roughly constant and refrain from dramatic increases. This causes a short-covering rally that lasts two months. All the investors who extrapolated and hedged for increasing duration supply must now cover their shorts. Because Treasury isn't increasing net coupon issuance, they must buy back their duration shorts from the market rather than from Treasury as they expected to do.

**January 31, 2024** — QRA indicates Treasury will modestly increase coupon supply again, but that it will strongly tilt the increase toward shorter-duration coupons rather than longer-duration coupons. This is modestly bearish for bonds but it’s not an actionable trade as the August and November QRAs were. Rather than cause a sharp market repricing like August and November QRAs did (in opposite directions), the January QRA implied more gradual but still persistent pressure on yields. The initial market reaction was for shorts to cover on the lack of a surge in supply, followed by the persistent upward pressure beginning to dominate.

**May 1, 2024** — By not increasing coupon sizes again, Treasury keeps steady the duration provided to the market, helping to avoid sharp increases in term premium. Treasury reaffirms forward guidance for no further coupon increases for several quarters, ensuring this dynamic persists throughout the year.

The term premium as estimated in Kim and Wright (2005) is displayed in Figure 7, with vertical lines marking the day before each relevant QRA. A similar narrative and visual approach from market participants is presented in Constan (2024).

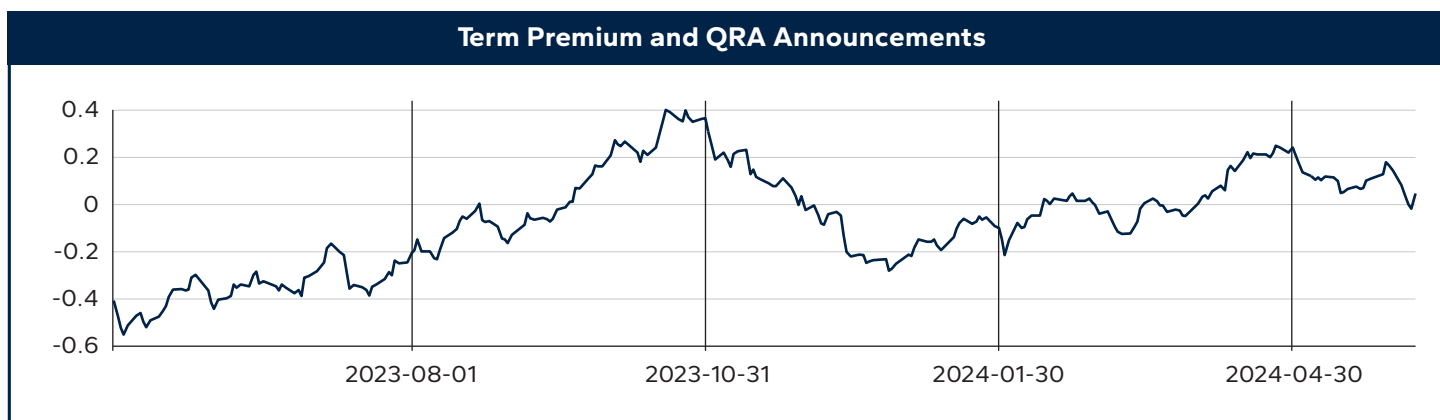


Figure 7 Kim-Wright (2005) Term premium on a ten-year Treasury note. Vertical lines show the days before important refunding announcements that catalyzed market moves (8/1/2023, 10/31/2023, 1/30/2024, and 4/30/2024). Source: Federal Reserve.

## Outlook for Issuance

### Future Missing Coupons

Perhaps the most surprising part of the change in Treasury’s issuance behavior has been the introduction of forward guidance to the Quarterly Refunding Announcements. For the last two refunding rounds, Treasury has indicated that “Based on current projected borrowing needs, Treasury does not anticipate needing to increase nominal coupon or FRN auction sizes for at least the next several quarters.”<sup>22</sup>

Such guidance reflects a desire to steer the market away from pricing in increased coupon issuance in response to gaping deficits, in an attempt to maintain easy financial conditions, in the same way the Fed uses forward guidance to steer expectations of the Funds rate—a tool developed in large part by then-Fed Chair Janet Yellen. Forward guidance on ATI works by encouraging the market to price higher bill rather than duration issuance.

Taking such guidance at face value, we can extrapolate the current \$1.1 trillion coupon auction schedule through the first quarter of 2025 and take into account estimated deficit needs and seasonal dynamics in order to estimate the split between bills and coupons in the future. Following the same calculation method as above, we estimate that the additional missing coupons will be about \$150 billion through the first quarter of 2025, bringing the total amount of stealth QE over this period to \$963 billion. This analysis ignores the reinstatement of the debt limit as of January 2, 2025, discussed in detail below.

22 <https://home.treasury.gov/news/press-releases/jy2315>

Forecast For Future Missing Coupons				
Line	Formula	(billions of \$)	2024 Q4	2025 Q1
1		Bills	\$ 208	\$ 200
2		Total financing need	\$ 665	\$ 770
3	(1/2)	Bill share	31.3%	26.0%
4	3 - 18%	Bill share deviation from target	13.3%	8.0%
5	4 * 2	<b>Missing coupons</b>	<b>\$ 88</b>	<b>\$ 61</b>
6	sum(5)	<b>Total</b>		<b>\$ 150</b>

Table 3 Expectations of missing coupons in future quarters. Source: US Treasury, HBC calculations. Numbers reflect issuance net of rolling over maturing debt.

Although the declining rate of missing coupons might suggest the palliative effects of ATI will be reduced into next year, the overall stance of policy is not changing. Insofar as the recent reductions in the pace of Fed QT reduce issuance demands on Treasury, liquidity drivers are shifting from ATI to monetary policy; less stealth QE is being offset (and caused) by less QT. If the Fed hadn't reduced the pace of QT, we would have to add \$135 billion per quarter further missing coupons to Table 3.

### What is to be Done With All Those Bills?

Facing the accumulating pile of bills, Treasury will need to decide what course to take. There is no law against running a bills share of outstanding Treasury securities in excess of 20%, and if current issuance patterns persist the bills share will converge over time closer to 30%. There are several meaningful costs to pursuing this policy, but no hard economic or legal constraints.

First, interest costs will be higher. With the yield curve inverted and rates on long-term debt below those on short-term debt, Treasury is choosing to issue at the most expensive point on the curve, and would reduce current interest expenses if it stuck to a traditional financing strategy. Indeed, the average interest rate paid on marketable Treasury debt is the highest since 2008 and interest expenses have become the single largest outlay for government.

Second, Treasury has increased its vulnerability to rollover risk. A variety of shocks can push rates in parts or all of the yield curve higher. Short-term borrowing must be refinanced more often, and large amounts of short-term borrowing leave Treasury vulnerable to the risk it will need to roll over debt at higher yields. With term premia on longer-term debt near zero, current long yields are very attractive for issuance, and given the nation's fiscal path, there is real risk that term premia will be higher over time. Greater exposure to rollover risk can prove quite costly from a fiscal perspective.

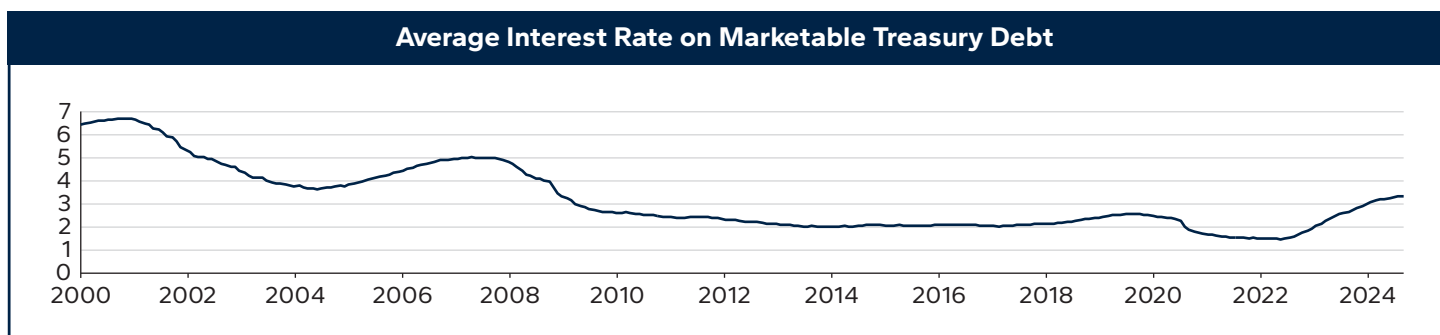


Figure 8 Average interest rate on marketable Treasury Debt. Source: US Treasury.

Greater rollover requirements also boost the risk that fiscal policy will have to violate the basic tenets of tax smoothing, incurring significant distortions from short-term variations in the tax rate. Economists accept that frequent changes to tax rates are bad for the economy and therefore variations in short-term funding requirements should be financed by deficits (Barro, 1979). If short-term borrowing becomes prohibitively expensive, government may have to raise tax rates instead. As Greenwood, Hanson and Stein (2015) argue, the large potential costs of tax smoothing failures provide a strong rationale for lengthening, not shortening, the maturity structure of the debt as the debt/GDP ratio rises.

Third, moving away from regular and predictable issuance patterns will likely lead, over time, to more expensive term premia as the market requires more compensation for volatility in issuance patterns and the risk of surprises. More sharply, a Treasury that is perceived as too afraid to issue more coupon debt will also be perceived as riskier by markets, provoking so-called bond vigilantes.

### **Political Business Cycles**

Our greatest concern is that regular use of ATI will push us into a world of more volatile political business cycles of the type studied in Alesina, Roubini and Cohen (1997). The classic theory of political business cycles posits that, going into an election, liberal parties are incentivized to increase spending to deliver benefits to their constituencies, while conservative parties are incentivized to cut taxes. Regardless of whether such policies are designed to boost the economy or not, they create a bias toward increasing deficits and stimulating the economy at the same cadence as the political cycle. The scope for using ATI to temporarily loosen liquidity conditions to just the other side of an election fits in nicely with this framework, since it will similarly synchronize the business cycle with the political cycle.

More regular employment of activist issuance policies for political reasons will induce higher equilibrium inflation and bond yields, as households, firms and investors come to expect regular stimulus regardless of whether the economy requires it.

There is no reason to expect this policy innovation of using the issuance profile to avoid tightening financial conditions will not become normal practice in Washington. Both parties will want to use all tools available to them, and once activist issuance policy becomes a tool for manipulating markets during election season, it is likely to become a new norm for both parties. Neither party will have an interest in unilaterally standing down. Thus, it is important to return to a regular and predictable issuance strategy as quickly as possible.

A truly independent central bank would offset such fiscal stimulus, but it must excel at forecasting and understanding fiscal policy in order to do so. Moreover, the Fed at present has difficulty offsetting ATI because of its asymmetric view of balance sheet policy. The Fed considers LSAPs to be monetary policy when it is providing additional accommodation at the zero lower bound. However, the Fed does not consider QT to be policy when it is allowing its balance sheet to shrink passively; it considers QT to be mere technical management of interbank liquidity markets, without meaningful effect on markets or the economy. Because the Fed views balance sheet policy as monetary policy only during periods of crisis and deflation risk, it is incapable of viewing ATI as impinging on monetary terrain; to do so would require it to rethink several of its models.

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Our greatest concern is that [regular use of ATI will push us into a world of more volatile political business cycles](#), with higher equilibrium inflation and interest rates.

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ATI has the potential to create strong political business cycles in the United States, leading to higher equilibrium inflation and inflation expectations, and lower long-term growth rates. The policy innovation of activist issuance is dangerous for all the same reasons economists prefer an independent central bank.

Nor is there any reason to think the use of ATI for managing the financial markets will be limited to election season. Administrations may find it useful to smooth bumps to the markets during any negative news cycle throughout a presidential term. Indeed, Fed purchases of intermediate- and longer-term Treasury securities, originally conceived as tool for financial emergencies only, were performed in 11 of the 15 years between 2008 and 2022. ATI may become a similarly permanent feature. The result, again, will be higher equilibrium inflation expectations and the accompanying higher Treasury yields, as policy stimulus becomes available for at-will use by Treasury to respond to short-term political exigencies.

### **Term-Out Costs**

Because the institutional costs and risks of keeping bill shares permanently large are high, we believe the \$1 trillion pile of accumulating bills will eventually have to be termed out. By insisting this won't happen for several quarters, Treasury is telling us it is likely to happen sometime in the first half of 2025—when there is a strong probability that Janet Yellen will no longer be Secretary. Regardless of whether her successor is a Democrat or a Republican, it is a problem to be dealt with later, and quite likely by someone else.

The trillion-dollar question is: when does the market start to price such a change in liquidity and issuance? In cases of changes to the Fed's asset purchase programs—such as starting or ending QE purchases—the market has tended to begin pricing such changes a couple of quarters before they occur. If the same happens here, Treasury's actions may buy it less time than it expects, while still incurring the same costs described above.

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## **Unwinding ATI will temporarily lift long yields by half a percent, before settling into a permanent 30-bp increase.**

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It is difficult to say exactly when the bond market may begin to price such a change, but when it does, market moves are likely to be sizeable. Anticipating the path of interest rates requires employing either the stock or flow views of QE described above.

If the flow view is correct, there are two different normalization channels. First, we expect permanently higher term premia from current levels due to indefinitely normalized future coupon issuance, as Treasury corrects forward-expectations for bill issuance back to the 15% to 20% range. We estimate this change to permanently boost long yields by about 30 basis points.

Second, Treasury is likely to redress the accumulation of excess bills from past ATI by terming out the bills into coupons. We calculate making up for *past* missing coupons will temporarily increase term premia by about 30 basis points,<sup>23</sup> if the term out occurs over a year. In monetary policy terms, these two channels are analogous to stopping QE (going from net security purchases by the Fed to stopping net security purchases is like reverting from 30%-40% bill issuance to 15%-20% bill issuance), and starting QT (termining out accumulated excess bills is like winding down previous LSAPs).

The combined effect is likely to temporarily lift 10-year yields by around 60 basis points, before reverting down to a permanent increase of 30 basis points. Risk assets are likely to correspondingly reprice.

By contrast, if the stock view is correct, then only the term-out matters, in which case markets would see an immediate, permanent 30-basis-point increase in term premia upon announcement of additional coupon sales.

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<sup>23</sup> Our analysis in this section differs from the analysis above because it incorporates our forecasts for additional ATI performed on an ongoing basis. Those forecasts are driven by deficit and issuance expectations. The 30 bp term premium effects we expect on a forward-looking basis are slightly larger than the 25 bp backward-looking calculations in the previous analysis. They also include terming out a portion of the remaining excess bills from right after the debt limit that we did not classify as "activist" earlier because they satisfy classic tax smoothing criteria, but which nevertheless need to be termed out, and therefore figure into any forward-looking market analysis.



We would expect the mechanics to work as follows, and as illustrated in Figure 9:

- 1) As of 1H 2025, roughly \$1 trillion of excess bills have accumulated via ATI, depressing 10-year yields by around 30 basis points relative to baseline on either stock or flow views.
- 2) ATI on a go-forward basis is abandoned, and the run rate of bill issuance declines to 15%-20%:
  - Flow view: term premium *permanently* rises by 30 basis points, reverting to baseline.
  - Stock view: term premium doesn't change, remaining *permanently* 30 basis points below baseline.
- 3) If the \$1 trillion of accumulated excess bills are termed out over the following year to quickly restore the outstanding stock of Treasury debt to the target bills ratio:
  - Flow view: term premium *temporarily* rises by an additional 30 basis points. When the term out is complete, term premium reverts to baseline if step 2 is complete.
  - Stock view: term premium permanently rises by 30 basis points, reverting to baseline if step 2 is complete.

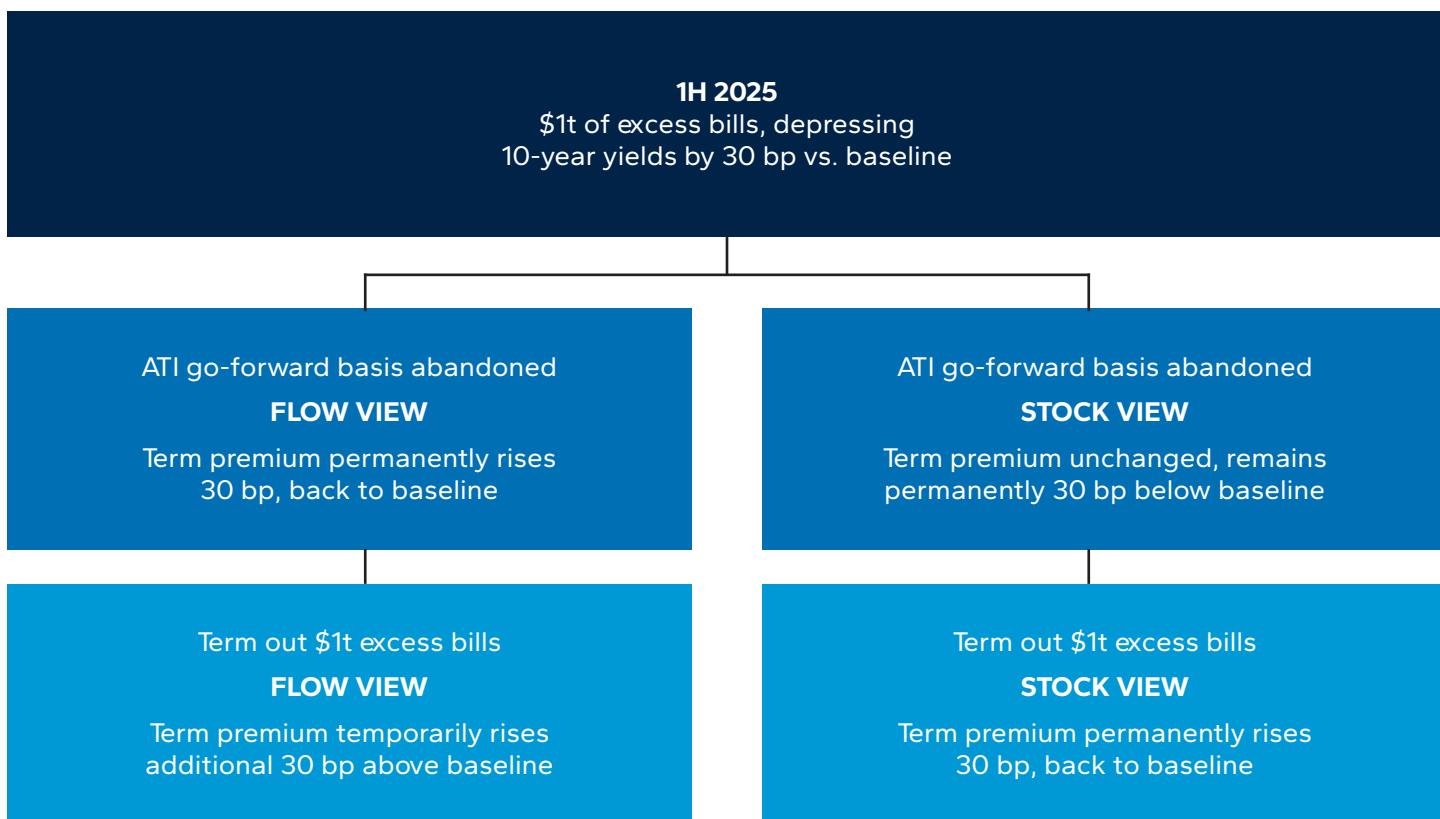


Figure 9 Mechanics of stock and flow views of ATI unwind.

In principle, steps 2 and 3 could occur in reverse order, but we consider that outcome unlikely, since any Treasury responsible enough to term out the excess bills is likely to correct issuance patterns on a go-forward basis as well. They may occur simultaneously.

We illustrate stock and flow views separately in Figures 10 and 11. In each case, the following Treasury actions are displayed:

- A) Before ATI, term premium has zero deviation from baseline, issuance is regular and predictable.
- B) ATI is underway, bill share of issuance running materially above 15%-20% target range.
- C) Treasury announces on go-forward basis it is normalizing future issuance to 15%-20% range.
- D) Treasury announces it is going below 15%-20% range to term out the \$1 trillion of accumulated excess bills.
- E) Term out complete, Treasury returns to regular and predictable issuance indefinitely.

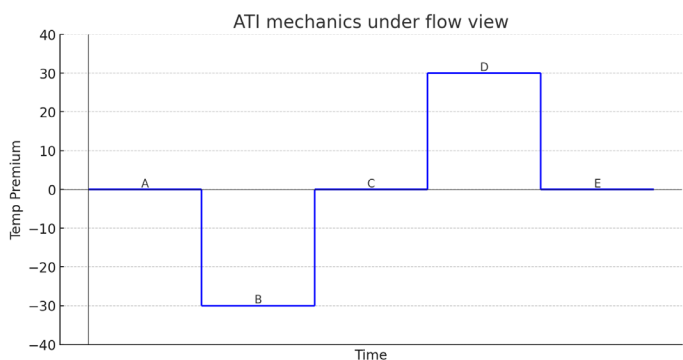


Figure 10 Flow-view ATI mechanics. During period A, ATI contributes 0 deviation from term premium baseline. During period B, bill issuance is running materially higher than the 15%-20% target range, reducing term premia by 30 bp. During period C, Treasury indicates it will return to the 15%-20% range on a go-forward basis, returning term premia to baseline. During period D, Treasury is unwinding the accumulated \$1 trillion of excess bills, raising term premia an additional 30 bp. During period E, the term-out is complete, and term premia revert to baseline.

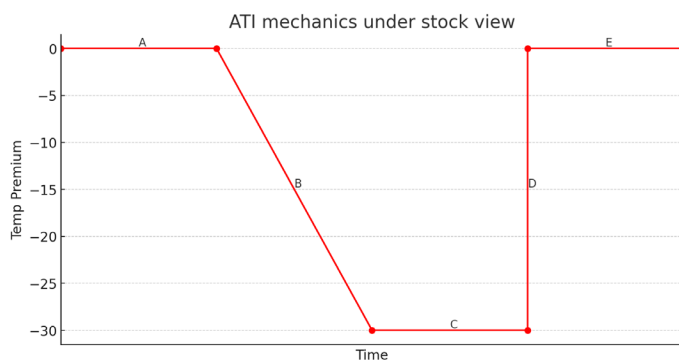


Figure 11 Stock-view ATI mechanics. During period A, ATI contributes 0 deviation from term premium baseline. During period B, bill issuance is running materially higher than the 15%-20% target range, reducing term premia by 30 bp. During period C, Treasury indicates it will return to the 15%-20% range on a go-forward basis, term premia stop going down, but the existing stock of accumulated excess bills keeps term premia depressed. At D, Treasury announces a term-out of the accumulated \$1 trillion excess bills, causing term premia to gradually revert to baseline. During period E, Treasury has returned to regular and predictable issuance, and term premia remain at baseline thereafter.

Although we expect Treasury to return to regular and predictable issuance and term out the accumulated bills, there is a significant chance neither of these occur. We could be stuck on line segments B or C for a long period of time. If we get stuck on B, the flow view indicates the suppression of term premia will remain relatively constant, whereas the stock view indicates the suppression will grow in size over time, making C more deeply negative.

Note that a traditional stock view would have segment B vertical, since the entire effect of a new QE program should get priced in relatively quickly at announcement. Where ATI differs from traditional QE is that the size of the program increases with every refunding announcement that deviates from regular and predictable issuance; we have thus portrayed B as a sloped line. However, because an announcement of the unwind of ATI will be for a known amount, we have portrayed D vertically.

While we think the flow view is more useful than the stock view, it's not unreasonable to weight them both. If we think the flow view is correct with 2/3 probability and the stock view with 1/3 probability, we can expect the initial, temporary increase in yields to be a total of 50 bp before settling into a permanent increase of 30 bp.

### Debt Limit Considerations

There is a major wrinkle in anticipating the timing: the bipartisan agreement to suspend the debt limit embodied in the Fiscal Responsibility Act (FRA) of 2023 expires on January 2, 2025.<sup>24</sup> If Treasury goes into the debt limit reinstatement with current levels in its Treasury General Account (TGA) near \$700 billion, it can go a quarter or two without issuing any new debt before running out of money, as it wears down its savings. However after the debt limit is subsequently raised or suspended again, Treasury will have to issue to fund not only current outlays but rebuild its coffers, as it did in 2023.

Further complicating matters, Section 401(c) of the FRA requires Treasury to be in the same fiscal position at debt limit reinstatement as it was at suspension, i.e. to reduce the size of the Treasury General Account from its current levels near \$700 billion down to \$23 billion, except for funds required to pay obligations before reinstatement. If Treasury were to do so, it would spend down its savings accounts in Q3 and Q4 of this year, and following a subsequent raise or suspension of the debt limit, repeat the dynamics of spring-summer 2023.

24 <https://www.congress.gov/bill/118th-congress/house-bill/3746>

However, as Schneider (2024) points out, the Yellen Treasury has ignored such a statutory requirement before. As the debt limit suspension of the Bipartisan Budget Act of 2019 expired in 2021, Treasury merely issued guidance<sup>25</sup> saying that it viewed higher cash balances as consistent with the law. Because only a chamber of Congress has standing to sue Treasury in the courts over a matter like this, no challenge was issued. Thus if Treasury follows its own previous guidance, it will spend down its savings accounts in Q1 of next year rather than Q4 of this year.

By contrast, if Secretary Yellen becomes extremely concerned about the election and desires to boost markets and the economy even further into November, she may reject her previous guidance and require Treasury to cease issuing and spend down TGA in the months before the election, for the sake of compliance with the statutory requirements of the FRA. Spending down the TGA is stimulative because it eliminates net coupon supply and increases money supply by converting government deposits into private sector deposits, in line with the channels discussed above. Roughly speaking, spending down the \$700 billion in the TGA would provide almost as much stimulus as the roughly \$800 billion of stealth QE, but twice as fast.

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Between adjustments to its issuance profile, discretion over the TGA balance, and the prospect for buybacks, **there are many paths for Treasury to implement ATI.**

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In a divided government scenario, the debt limit is likely to spark a new confrontation next year entailing the paydown of Treasury's savings accounts and cessation of new issuance. Congressional majorities from the same party as the President in 2025 are more likely to quickly raise the debt limit.

In any case, the stockpile of bills that need to be termed out into coupon securities is only growing as Treasury delays. The longer Treasury waits to term out the bills, the more violent the response will be when Treasury finally undertakes it, since the stockpile of bills grows larger every day.

## Buybacks

Another potential element of ATI is the introduction of a buyback program, whereby Treasury can purchase cheap off-the-run securities from the market, funded by new issuance. The purported goal of the program is to improve liquidity and market functioning: off-the-run securities become less liquid over the years that pass since their auctions, and as a result trade at a discount in the market. Because bond prices and yields move in opposite directions, the liquidity discount implies higher borrowing costs for taxpayers. Treasury can repurchase these securities and provide more liquidity into the market, improving market functioning and reducing borrowing costs.

In theory, this is a good idea. Those illiquid bonds are often purchased by hedge funds engaged in the "basis trade," who take large amounts of leverage and sell Treasury futures against the cheap bonds to hedge interest rate risk. When the basis narrows between the cheap off-the-run bond and the on-the-run yield curve, the investors make a profit. While the improvement in market functioning is not likely to be large, it can marginally lower borrowing costs for the taxpayer to buy back the cheaper bonds and replace them with lower-yielding on-the-run new issues. In this sense, the taxpayer can recapture some of that alpha back from basis-trading hedge funds.

While the initially planned buybacks are small, totaling \$15 billion through July, there is scope to dramatically increase the size of buybacks once Treasury becomes comfortable with operations, and Treasury has given preliminary indications of conducting \$30 billion in quarterly buybacks.

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25 <https://home.treasury.gov/news/press-releases/jy0164>

Where it gets interesting is that a key and seemingly technical element of the buyback program gives Treasury the ability to replicate another major feature of the Fed's QE programs. Treasury states<sup>26</sup> that "amounts spent to buy back securities will be treated like any other source of borrowing needs for debt management purposes. Treasury will not attempt to directly align additional issuance with securities bought back at a specific tenor." Combined with the previously-discussed forward guidance for coupon auctions for the next several quarters, that implies that increased buybacks will be funded through bill issuance, since Treasury won't increase issuance of on-the-run securities of the same maturity in order to fund buybacks. Thus while Treasury claims that buybacks are "not intended to change the overall maturity profile of the debt outstanding," the forward guidance not to increase auction sizes implies they will nevertheless do so.

If Treasury increased supply of on-the-run 7-year notes to buy back old, off-the-run 7-year notes, there would be no net change in duration supply and thus no serious macroeconomic or market implications. However, if Treasury buys back old, off-the-run 7-year notes funded by increased bill issuance, there's a net reduction in duration supply.

Such a dynamic replicates the Fed's version of Operation Twist whereby the Fed lengthened the duration of its balance sheet in 2011 by selling short-duration securities and buying long-duration securities. If Treasury decides to ramp up the buyback program and does so by issuing bills, it will have a stimulative effect on the market as the Fed's twist program did thirteen years ago. Removing duration held by the public and replacing it with more money-like instruments (bills) will be stimulative. This will be particularly the case as Treasury increases the size of the program while adhering to its forward guidance not to increase coupon auctions.

The buyback program is not a significant liquidity easing as currently constituted, as it is too small in size. However, as Treasury ramps it up, it may become so. Treasury has discretion to increase the size of the buyback program whenever it deems it appropriate. Giving a political institution like Treasury authority over monetary-policy-like tools bears the same dangers as political interference in monetary policy and opens another potential dimension for ATI. Once they are forged, there is little reason to expect useful tools won't be employed repeatedly for stimulating markets and the economy at opportune moments.

## Criticisms of the ATI View

We imagine there are several criticisms of our argument that officials or analysts might make.

### **From the Fed: "QT is Not Monetary Policy"**

First, we imagine that if the Fed considers that quantitative easing is monetary policy, but quantitative tightening is not, they will extend that view to ATI. The Fed has long had the view that unlike QE, QT is something that "runs quietly in the background." Former Fed Chair Yellen (2017) famously described it as "like watching paint dry," though the Fed's subsequent understanding of how the banking system uses reserves in a Basel III world have led to the nuances reflected in the Fed's current thinking described in Waller (2024) and Bowman (2024).

There are several reasons for the Fed's asymmetric interpretation of balance sheet operations. First, QT is passive, and consists of letting bonds mature off the balance sheet and having Treasury roll them over into public hands rather than the Fed's balance sheet. By contrast, QE is active, and involves the Fed buying bonds from the public. Second, QT occurs in different market and economic environments, whereas bond purchases are in principle a crisis-fighting tool, although they have been used in 11 out of 15 years from 2008 and 2022. Finally, the Fed views QT as targeted for the sake of managing reserves in the financial system and the interactions of bank capital regulations with the Fed's balance sheet, while monetary policy is set by the Funds rate, and in principle believes it can move these two instruments in opposite directions.

26 <https://home.treasury.gov/system/files/221/TreasurySupplementalQ22024.pdf>

We expect Fed officials might respond to our arguments by saying “QT is not monetary policy, and neither is ATI.”

We don't believe this is a valid criticism of our ATI framework, because what matters is whether someone is selling \$1 trillion of duration-bearing securities into the market or not, not who is doing the selling. Arguing over whether it's “monetary policy” or “fiscal policy” is a matter of semantics, particularly when the monetary-fiscal barrier has been substantially eroded by the overuse of quantitative easing, a criticism often levied against QE but usually dismissed by policymakers. Monetary policy can be quasi-fiscal, and fiscal policy can be quasi-monetary.

Indeed, a review of the empirical finance literature we employed in calculating the size of ATI effects, in particular the papers from Greenwood and Vayanos (2014) and Hou (2018), indicate that changes in the amount of duration issued by Treasury do affect market yields. If we are right that ATI works through similar channels as QE, it makes the Fed's insistence that QT is not monetary policy even more problematic.

Finally, even if we accept the Fed's view that QE is monetary policy but QT is not, we argue that Treasury's actions are equivalent to QE, not to QT. So even if the Fed view is correct, ATI still has meaningful effects.

### **From Treasury: “Issuance is in Fact Regular and Predictable”**

The second criticism we imagine officials to make is that there has been no real policy change to Treasury's issuance. The weaker form of this objection would be Treasury asserting that the bills share of new issuance isn't excessively high and that because the bills share of outstanding debt is close to its long-term average, issuance is still regular and predictable; Secretary Yellen recently made a version of this argument (U.S. Senate, 2024). Our response would of course be that whether we call it regular and predictable or not is of secondary importance, we have worked through the arithmetic of issuance changes and their effects and any serious criticism should focus on that and not labels.

The stronger form of this argument is that because inflation is elevated and Treasury expects the Fed to be able to cut interest rates in the near future, it would be extremely disadvantageous to lock in long-term borrowing rates now when they will be much lower in the future. Treasury should therefore increase short-term issuance to maximize its ability to take advantage of lower yields in the future.

There are several problems with this argument. First, Treasury's longstanding principles for debt management preclude acting as a “market timer” or “reacting to current rate levels” (U.S. Treasury, 2024b). Secretary Yellen affirmed this in testimony to the Senate Appropriations Committee as recently as June 4, saying “our objective is to issue at least cost over time, and not to try to time the market” (U.S. Senate 2024). Treasury rightfully acknowledges that it can get the macroeconomic outlook or interest rate forecast wrong and therefore doesn't attempt to adjust its issuance schedule to it, and instead tries to stick to long-term policies designed to minimize interest secularly rather than over the business cycle. In other words, Treasury has already told us this isn't happening.

The second problem with this objection is that if Treasury repudiates its longstanding debt management principles in favor of managing issuance to the interest rate cycle, or pursues such a goal implicitly without making it explicit, it will still be activist in its issuance, just for a different stated purpose than for managing economic outcomes. Different motives do not alter the consequences of Treasury's policy choices.

The final problem with this objection is that by loosening financial conditions, ATI, if conducted for this purpose, has become self-defeating. By injecting fresh stimulus into the economy, ATI has delayed the return of inflation to the Fed's target, and with it a cutting cycle and disinversion of the yield curve. With an inverted yield curve, issuing more short-term debt is more expensive while we wait for disinversion. Being wrong about timing can entail significantly greater interest expense. The term spread between one-year and ten-year yields has been inverted since July of 2022, indicating this strategy, if in use, has backfired and increased interest expenses rather than decreased them, for two years running.

**From Treasury: “The Bill Share is Only a Few Percentage Points Above 20%.”**

Treasury might also argue that the share of debt in bills is only a few percentage points above 20%, because the 15-20% target corresponds to the stock of debt and not the flow. This fact is true, but doesn't alter any of our analysis, because what matters economically is the dollar-value of coupons that must be absorbed by the market, not the percentage.

Marketable Treasury debt is in excess of \$27 trillion. It takes less than a four-point swing in the bill share to cause a flow in excess of \$1 trillion that markets must absorb, and a \$1 trillion flow of duration-bearing debt will result in material price changes.

Indeed, QE programs are often measured in terms of a few percentage points of GDP, and the swing here is similar in magnitude. The two rules of thumb discussed above indicate that a one-percentage-point-sized LSAP can move term premia between 6 and 10 basis points. With the debt/GDP ratio near 100%,<sup>27</sup> a one-percentage-point swing in the stock share of bills can have effects of similar magnitude.

Second, the flow of bills issued every quarter has been and continues to run meaningfully above 20%, and that is what we have largely focused on in this study. Over time, the rolling over of maturing debt will lead the stock bills share to converge to the flow bills share. Although the stock bills share at this moment is closer to 20% than the flow bills share, it's heading in the wrong direction every day until the flow share is corrected.

Finally, the swing in the bills share in the period of ATI is roughly the same size as that experienced during genuine spikes in funding needs like the pandemic recession and the Global Financial Crisis, and on a larger size of the national debt. These recessions saw large swings in debt issuance policy motivated by genuine economic shocks. In this sense, there's nothing trivial about recent changes in issuance policy.

**From Treasury: “The Bill Share Has Always Varied Over Time.”**

Additionally, we think Treasury might argue that the bill share has always fluctuated, ranging between 10% and 35% over the years, and that recent variation is nothing special. However, Treasury has always been clear that changes in the target bill share have been due to evolving market structure and regulatory requirements, as we described above. Indeed, Treasury tries to set the bill share target for longer-term supply and demand considerations, not short-term management of liquidity, interest rates or the economy.

Treasury has not claimed any such motivation for changing the target bill share, and has maintained the 15-20% target. If Treasury declared it were permanently increasing the target share of bills to accommodate some change in regulations, that would be an argument that it is not engaging in ATI. Treasury insists it hasn't done so; instead, what Treasury is doing is overshooting the target bill share for a sustained period, which is indicative of ATI.

**From Treasury: “Focus on WAM, Not the Bill Share, and WAM is Within Historic Norms.”**

Finally, Treasury might argue that the appropriate metric for issuance policy is the weighted average maturity (WAM) of the debt, not the relative shares of bills and coupons, and that WAM is within historic norms.

We believe WAM is a less appropriate measure of Treasury-induced liquidity effects than more direct measures of money and interest rate risk that markets must absorb, because it is the latter which sets prices in financial markets, through which ATI works.

The core theoretical underpinning for both QE and ATI is the substitutability between reserves and bills, but nonsubstitutability between reserves and coupons. As we have emphasized, bills are not money, but they are quasi-money, and coupons are not. The policy transmission channel for these policies is changes to the dollar amounts of money and non-money held by the public. WAM is correlated with the amount of money and non-money held by the public, but it is conceptually different.

27 <https://fred.stlouisfed.org/series/FYGFQDQ188S>



LSAPs both as studied by academics and implemented by central banks, in part for this reason, focus on dollar amounts and not the profile of outstanding debt, and we have generally taken our cues from the monetary policy literature. The Fed never announces a QE program targeting WAM. Moreover, Treasury does target the bill share, and that has provided an important guidepost as well.

To see why WAM is an imperfect measure of ATI, consider a situation in which Treasury desires to simultaneously increase the amount of bills sold, but extend duration of the coupon debt by increasing the amount of 30-year debt sold and decreasing the amount of 5- to 10-year debt, so that WAM remains unchanged.<sup>28</sup> An analysis of ATI focusing exclusively on WAM would predict no economic effects. However, this would likely be a loosening of liquidity conditions. The amount of quasi-money would increase with the bill share, and while 30-year yields might increase, 5- to 10-year yields would, all else equal, decrease, as supply declined. More economic activity is priced off of these nodes than off 30-year bonds, so economically sensitive yields would decline. (Corporates often borrow in the belly of the curve, and mortgages are priced relative to 10-year notes because prepayment means they have similar duration; these securities are priced as spreads to the benchmark.)

Alternatively, consider the period of the debt limit confrontation in the first half of 2023: WAM didn't change, or increased slightly, as new issuance ceased and TGA was spent down. Looking only at the WAM of outstanding debt, one might think Treasury liquidity policy was neutral, maybe slightly tightening. In fact, it was an enormous loosening of liquidity conditions via changing Treasury issuance policy as new coupon issuance ceased and public savings accounts got converted into private money supply. (Treasury would rightfully argue that in this case it was following the statutory obligations imposed by the debt limit, but the episode helps illustrate the shortcomings of examining WAM alone.)

WAM is an imperfect measure, and we are not sure any measure, the bill share or otherwise, is perfect. We believe there is much work to be done by academics, policymakers and investors on ATI and the market and economic effects of Treasury issuance policy, and view this study as only a first step. We have treated the "missing coupons" as the appropriate metric of ATI because it fits most easily in the context of the monetary policy literature on LSAPs, which is the best developed academic literature to use as a springboard for studying ATI.

Nevertheless, if one wants to take WAM seriously despite its shortcomings, we have also analyzed ATI in the context of WAM, in the section drawing on empirical studies of issuance from the asset pricing literature, which use WAM as the independent variable for examining term premium. The results from these calculations are consistent with our claims.

We make three observations regarding using WAM to analyze ATI. First, regarding measuring the market and economic effects of Treasury issuance: if these effects work through WAM, they work through the WAM of debt owned only by private savers and investors, so to measure the effects of ATI we must exclude debt owned by the government either via the Fed's SOMA or other governmental savings accounts. The transmission channels of ATI are interest rate risk held by the public and money held by the public, not held by the government. Slide 24 of U.S. Treasury (2024a) neatly breaks out a measure of WAM by government vs. private ownership, and from these data we have produced Figure 3 above. ATI is visible in the reduction in maturity of debt held by the public beginning in 2023.

ATI brought the weighted average maturity of the stock of privately-owned debt below pre-Covid levels, and the size of the decline was roughly half that experienced in the Global Financial Crisis or the Covid recession. In that sense, the amount of economic support provided by changes to the duration profile was roughly half that provided in the two biggest economic crises since the Great Depression.

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<sup>28</sup> We discussed an instance of Treasury increasing the bills share to offset extending the duration of coupon debt in our historical context of the bills share target above.

Second, regarding whether Treasury is behaving regularly: it is important to note that the duration of overall debt issuance, including Fed holdings, shortened enormously during the pandemic due to the Fed's QE programs. Disentangling monetary and fiscal policy is much more difficult when analyzing WAM than when analyzing the volume of coupon issuance that must be absorbed by the public. This is important because a great deal of long-duration debt became sequestered away on the Fed's balance sheet, replaced with overnight reserves. If Treasury wishes to argue its issuance behavior is regular and predictable, this debt must be included, regardless of who owns it. Including Fed holdings in measures of WAM indicates that overall WAM is still roughly half a year below levels that prevailed before Covid. (This is the so-called consolidated holdings of Treasury debt and reflects the additional short-term issuance in the form of reserves, which as we have stressed are close substitutes for bills.)

In other words, we need to use different measures of WAM for quantifying market effects and qualifying issuance behavior. Market effects depend solely on debt held by the public. The market effects of the Fed's holdings are QE, not ATI. On the other hand, to assess whether issuance behavior is in line with historic norms, we need to use the consolidated measure of the debt, which adds in holdings by the Fed. Whether the Fed engages in QE or not works through similar channels as ATI, but doesn't change issuance policy, and we cannot exclude it in evaluating Treasury's behavior.

Third, and by far most importantly, evaluating ATI requires examining marginal changes in the public's holdings, not average characteristics. One of the basic principles in economics is that the marginal transaction sets the price, not the average transaction, and it is the prices in financial markets through which ATI works. Therefore, to consider ATI measured by WAM, one should focus on the WAM of new debt, as does Hou (2018), rather than the WAM of overall outstanding debt.

Since the bill share has been running irregularly high and is expected to continue doing so, the WAM of new debt is lower than has historically been the case. As long as that persists, the WAM of the stock of existing debt will continue drifting lower as well.

#### **From Analysts: "Why Haven't Markets Priced in the Terming Out of Excess Bills?"**

Since financial markets are, to a significant extent, forward-looking and efficient, it is reasonable to ask why market prices haven't already incorporated the terming out of the excess Treasury bills. If market prices don't reflect a large bills term-out, do investors reject the possibility of ATI?

In response, we note that there are limits to markets' foresight and efficiency. For one thing, as we discuss at length, there is a great deal of uncertainty over the timing of any prospective term out. It could happen in early 2025, but it also could be years later if ATI becomes a permanent tool. There are even scenarios in which the term out never occurs, as we note above.

The timing question is further complicated by the debt limit reinstatement expected in early 2025; there may be a paucity of coupons before there is a surfeit. Without clarity over timing, it is difficult for markets to price efficiently.

To consider the difficulty markets have in pricing events that are certain to occur in the long term, but whose timing markets cannot pin down, recall again the 2013 "taper tantrum," in which Federal Reserve officials speculated the Fed might soon reduce its pace of QE purchases. In this episode, 10-year yields rose by nearly 150 basis points. That QE would not continue forever and would eventually come to an end was obvious and well understood by market participants well before Fed officials' public comments. However, it wasn't until that the end of QE was brought into the investment horizon in which markets can price fundamentals that yields moved higher; markets required a catalyst to focus attention on impending policy changes.

Similarly, the long-term unsustainability of the U.S. fiscal dynamics has been well known to economists for decades; but as long as the Social Security and Medicare Trust Funds have positive balances, business as usual continues as those balances are spent down. Binding constraints under which the U.S. government will have to dramatically raise deficits, cut benefits, or raise taxes are nearly a decade out, so markets continue to ignore a thirty-year fiscal gap on the order of \$119 trillion (Riedl 2023).

With so much uncertainty, we are unsurprised that markets do not yet price the term out, and indeed would be more surprised if they did.

## Conclusion

New issuance patterns by Treasury have deviated from “regular and predictable” auctions in a manner that exerts heavy influence on financial conditions and through them, the economy. We dub the use of varying issuance patterns for the sake of managing financial conditions “activist Treasury issuance,” or ATI.

Drawing on a range of empirical economic studies of monetary policy, finance and fiscal policy, we calculate that ATI has reduced long-term interest rates by about a quarter-point, providing similar economic accommodation as a full point reduction in the Fed’s overnight policy rate. Combined with estimates of the neutral policy rate drifting higher, the joint stance of monetary and issuance policy is roughly neutral: the Fed isn’t providing meaningful economic restriction, contributing to inflation persistence.

However, we expect the surfeit of bills to be termed out, eventually. When the market starts to look forward to over \$1 trillion of bills being termed out into notes and bonds, we expect it to temporarily raise long-term interest rates by 50 basis points, prompting a meaningful repricing of risk assets, before settling back into a permanent 30 basis point increase.

The use of ATI to manage financial conditions and the economy into election season is a dangerous precedent that opens the door for material political business cycles in the United States. It threatens to raise long-run inflation and interest rates over time as future administrations make use of the same tool.

Frequent use of QE since the Global Financial Crisis has shone a light on the eroding barrier between monetary and fiscal policy, and opened the door for tools like ATI. The interaction between policy choices from the Fed and Treasury will remain a fruitful area of study for market participants, policymakers and academics.

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