# "Treasury market structure": fewer and larger

## Introduction

Jerome Powell, Chair of the Federal Reserve, April 28th, 2021[†1]:

> *… Treasury market structure. Dealers are committing less capital to that activity now than they were 10 or 15 years ago, and the need for capital is higher because there's so much more supply of Treasuries. And so, there are some questions about Treasury market structure, and there's a lot of careful work going on to understand whether there is something we can do about this, because … the U.S. Treasury market is probably the … single most important market … in the world. It needs to be liquid. It needs to function well for the good of our economy and the good of our citizens.*

**There is something the US Treasury can do, something that is negative cost and politically uncontroversial. US Treasury securities should be fewer and hence larger.**

## Current position

The table on the right shows the current shape of issuance of conventional Treasuries securities (though similar comments could be made about inflation-linked and floating-rate securities, this paper is about conventional securities). For each maturity tenor it shows the number of new securities issued per year, and hence the number of that tenor's old securities that will exist if the current issuance shape were to continue.

| Mat | Per year | Num in limit |
|---|---|---|
| 30 | 4 | 120 |
| 20 | 4 | 80 |
| 10 | 4 | 40 |
| 7 | 12 | 84 |
| 5 | 12 | 60 |
| 3 | 12 | 36 |
| 2 | 12 | 24 |
| | Total: | 444 |

As of now the US Treasury has outstanding 353 distinct coupon securities. Assuming only a few occasions that a new coupon precisely matches the coupon of an existing same-maturity security[†2], by mid-2040 the US will have outstanding most of 444 distinct securities. Indeed, in the range 10 to 30 years the US has 102 securities, which will plateau near 120 = 80 × old thirties + 40 × old twenties.

Compare UK conventional gilts, of which there are 70 outstanding. There are 34 of these below 10 years, so 3.4 per year, and in the range 10 to 30 years there are 28 distinct conventional gilts, which is too many by a factor of about 4, as shown by the natural experiment below.

## Bond density

What is the correct answer? How many separate bonds should there be? Equivalently, how dense or sparse should they be? Inevitably, there are *desiderata* pushing in each direction.

### Costs of too many

Dealers buy and sell. Their hope is to buy slightly cheaper than the market price, sell slightly richer, and thereby profit by the bid-ask spread. If a dealer were to buy the 5⅜% Nov 2056, and sell the 5⅛% Aug 2056, in similar size, the interest-rate risks would very closely offset. But the positions wouldn't offset: the dealer would need repo to fund the Nov 2056 long and to borrow the Aug 2056. There is a cost to these two repo operations, and a balance-sheet cost to the two bond positions.

If money-markets were under stress, the repo cost might be very expensive or dysfunctional. If banks were under stress, the balance-sheet cost might be prohibitive.

But these two 2056 Treasuries have very similar interest-rate risks. Any natural liability hedgeable by one would be hedgeable by the other. If only one bond had existed, then the buy and the sell would offset. For a primary dealer that would be more balance-sheet efficient, and there would be less repo cost. The market would be less dependent on the availability of repo, use less balance sheet, be cheaper to operate, more robust to crises, and

†1 Page 25 of http://www.federalreserve.gov/mediacenter/files/FOMCpresconf20210428.pdf

†2 E.g., February 25th, 2025: "today's 5-year note auction resulted in an unscheduled reopening of the 7-year notes" with a coupon of 4% "originally issued February 28, 2023": https://treasurydirect.gov/instit/annceresult/press/preanre/2025/SPL_20250225_1.pdf

more likely to attract or keep primary dealers. So, just because more trades would offset, fewer securities would reduce dealing costs. Also, fewer securities would be larger securities: not only would there be less requirement for repo, it would be more easily available.

But there are limits to this argument, as the optimal number of separate securities must be more than just one. The constraints are the needs of the issuer, and the needs of the investors.

### The Treasury's need: smooth repayments

Finance ministries, not only of the United States, naturally want a reasonably smooth repayment profile. They don't want several years of no payments, followed by one year with maturities totalling most of annual GDP.

By definition, repayments are of ultra-short maturities. If there were large gaps between 30-year securities, the profile could be subsequently smoothed by issuing into the gaps.

This smoothness does not need to be on the time scale of days, nor even of weeks. A large maturity could be hastened if the Treasury were to buy the short-dated security, or the cash outflow *de facto* postponed by Bill issuance or other borrowing. Hence the smoothness can be on a time scale of multiple months. The UK has, 2014–2025, averaged 2.9 conventional maturities a year. Two might be the optimal number, but four per year would not be very unreasonable. Currently the US has 54 maturities per year, and when old twenties have rolled down there will be 60 per year (12 × 2s, 12 × 3s, 12 × 5s, 12 × 7s, 4 × 10s, 4 × 20s, 4 × 30s: $\sum = 60$).

Of course, repayment smoothness is not helped by having multiple different securities mature on the same day. Currently almost every month has three month-end securities, and at least one mid-month maturity. This is a loss of trading liquidity, and an increase in repo and balance-sheet costs, for no gain of smoothness.

### Investors' needs

Investors have natural liabilities to hedge. *Reductio ad absurdum*: if the only Treasury were a 2Y, then some investors would be willing to substantially overpay for a small issuance of a long bond. Hence large issuers should have a range of maturities sufficient for the needs of the various types of investors.

Instead hypothesise that there exists a 25Y and a 30Y, and none between. Using a weighted combination of these two, any natural liability between them could be hedged very closely. In such a market one would not expect that investors would be willing to over-pay for a 27Y. (Indeed a '27-year natural liability' means an actuarial approximation to a liability, the longevity uncertainty being much larger than the volatility of the implied 25s27s30s barbell.)

### The natural experiment

So what maturities are needed? Fortunately, there is a natural experiment: the swap market. Since the early nineteen-nineties brokers have maintained pages showing swap rates. These pages show enough detail that, from them, any swap can be priced, even those starting far in the future.

In non-euro currencies these pages have many swaps out to about 2 years, then annual to 10 years, followed by some of 12, 15, 20, 25, 30, 40, and 50 years. E.g., ICAP's page for $ swaps has 1-month, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 18, 21, 24-month, 3Y, 4Y, 5Y, 6Y, 7Y, 8Y, 9Y, 10Y, 12Y, 15Y, 20Y, 25Y, 30Y, and 40Y. Some currencies also include some of 11Y (because the '10-year' future is actually slightly longer), 35Y, 60Y, and 70Y. Only EUR is denser. Hence between 10 and 30 years it would suffice to have six tradeable yields: 10Y, 12Y, 15Y, 20Y, 25Y, and 30Y.

An investor with, say, a 27-year liability, could buy a weighted mix of the 25Y and 30Y. The policy proposals are slightly less sparse than this.

## Original Issue Discount

Mention must be made of the Original Issue Discount constraint. Some other countries reopen bonds many times[†3], but in the US reopening old sub-par securities can cause tax bureaucracy for investors.

†3 E.g., gilt 4¼% June 2032 was originally issued May 24th 20**00**; most recently sold May 21st 20**20**. http://www.dmo.gov.uk/media/16547/pr140520d.pdf
E.g., gilt 0½% Oct 2061 was reopened at a price of 33.172 on March 8th 2023. http://dmo.gov.uk/media/3ghhfojl/080323conventional.pdf

Reopenings are safe in the first year of life of a new security, and one of the policy proposals fits within that constraint.

But would it be so difficult for the US Treasury to seek to exempt itself more broadly from OID? The 1969 rules were changed in 2001, and that seems to have been uncontroversial. From the *Federal Register*, January 12th, 2001[†4]:

> *On November 5, 1999, temporary regulations were published … that revised the rules for when a reopening of Treasury securities is a qualified reopening. …*
>
> *Although a public hearing on the proposed regulations was held on March 22, 2000, no one testified at the hearing. Eight comment letters, however, were received …. The proposed regulations, with certain changes to respond to the comments, are adopted as final regulations.*

## The policy proposal, without curve extension

The following program of issuance of new securities shows that many fewer securities can still meet the needs of the issuer and of investors. Though denser than optimal, it is still a reasonable balance of the advantages of fewer and larger. However, this first proposal is not compliant with current OID rules.

- One new 30Y every alternate year. There would still be monthly auctions of these: after creation each would then be reopened twenty-three times.
- One new 20Y every alternate year, exactly mid-way between the old 30s. As with the 30Y, each would be reopened multiple times. Some of the *circa*-20-year reopenings could be of the old 30s, such that adjacent 20s and old 30s exit this maturity zone at a similar size.
- One new 10Y every year, mid-way between the old 20Y and the old 30Y. So if the 30s and 20s mature May 15th, then all the 10s would mature November 15th. Again, if the issuance were then so large that the 10s would be larger than the old longer bonds, some of the *circa*-10-year reopenings could be of the old 20s or 30s.
- Two 5Y securities every year, mid-way between the old 10 and the old 20 or old 30. Given the choice of month above, the 5s would have mid-February and mid-August maturities.

| Mat | Density below | Per year | Num in limit |
|---|---|---|---|
| 30 | ½ | ½ | 15 |
| 20 | 1 | ½ | 10 |
| 10 | 2 | 1 | 10 |
| 5 | 4 | 2 | 10 |
| | | Total: | 45 |

There could be issuance at 7 or 3 or 2 years, but all this issuance would be in the form of a reopening of an existing security with that approximate maturity.

The table shows that this shape of issuance would eventually result in a total of 45 Treasury securities. (The second column shows how many bonds there are just shorter than each maturity. E.g., shorter than 10 years, but longer than 5 years, there would be 2 securities per year.)

With securities being fewer, they would be larger. So transactions would be more likely to offset, making the bonds more liquid and easier to repo. Observe that in calendar 2027 there will mature conventional US Treasuries totalling $3,046bn. Split between just four securities each would be about $761bn. The large size is a feature, not a bug (given the size of the whole debt).

### OID compliant: 50 securities

A new 30Y every other year assumes that OID rules could be loosened.

If that were not possible, there would have to be a new 30Y every year. Assuming that, one 10Y each year mid-way between two old 30s; and two 5s per year. This modified plan implies the existence of 50 securities, and four conventional maturities per year. Sometimes *circa*-10-year reopenings of old 30s, to equalise sizes, would be OID-blocked.

| Mat | Density below | Per year | Num in limit |
|---|---|---|---|
| 30 | 1 | 1 | 30 |
| 10 | 2 | 1 | 10 |
| 5 | 4 | 2 | 10 |
| | | Total: | 50 |

### Sparser: 25 securities

Even sparser would be better, but that requires a longer longest bond. A new 50Y every eight years; a new 30Y every eight, mid-way between the old 50s; a new 20Y every four years mid-way

†4 http://www.federalregister.gov/documents/2001/01/12/01-622/reopenings-of-treasury-securities-and-other-debt-instruments-original-issue-discount

between an old 30 and an old 50; a new 10Y in alternate years; and each year one new 5Y mid-way between, six months from each of, the old 10 and an old long. That would result in only two conventional maturities per year. An average of 25 securities would suffice, but that cannot be far from the too-sparse boundary.

| Mat | Density below | Per year | Num in limit |
|---|---|---|---|
| 50 | ⅛ | ⅛ | 6¼ |
| 30 | ¼ | ⅛ | 3¾ |
| 20 | ½ | ¼ | 5 |
| 10 | 1 | ½ | 5 |
| 5 | 2 | 1 | 5 |
| | | Total: | 25 |

The 50Y is needed because a 26.1-year is materially shorter than a 30-year. But a portfolio of some 26.1-year and some of a 34.1-year could satisfactorily hedge a 30-year liability (being shortly before the issuance of a new 30Y). Counterintuitively, longer permits fewer.

This is close to, but not quite my recommendation. Ideally, to this would be added a much longer bond, a 200Y or 250Y, created new once every ≈120 years, and after some quarterly reopenings then reopened at least annually. This bond would be on the 50Y's sequence, so once every century-ish there would not be a new 50Y. But this should wait until yields are again ≤ 3½%; and, separately, it is acknowledged that multi-century bonds seem to be far beyond the comfort zone of the US Treasury.

## Reversibility

Economic history has many examples of seemingly good policies that interacted badly with new incentives, with Goodhart's law, or with the Lucas critique. This policy has an advantage of being reversible.

If there were an unanticipated cost to Treasury securities being fewer and larger, then the policy could be easily reversed.

- New Treasury securities could be created, and new issuance could be of those, and not of the existing Treasuries.
- If that were insufficient or too slow, then part of each of the old large Treasuries could be switch-auctioned[†5] into the new small Treasuries, until the sizes become about equal.

This reversibility lowers the risk of the proposed policy being started.

However, the current policy is not quickly reversible: once created, a Treasury exists until maturity.

## Coupons

In both the US and the UK, though by different mechanisms, new bonds have a coupon set close to current yields. There is sense to this: at various times tax regimes have taxed income more heavily than capital gain, so some investors have preferred to move return from income to capital appreciation. That is, they have preferred low-coupon bonds. To prevent corporate issuers from cheapening their cost of funding at the expense of tax revenue, multiple jurisdictions require that new bonds have a near-par coupon.

But this logic has a weakness. Investors can choose to invest in bonds issued when yields were lower, that is, bonds with a below-par coupon. E.g., in the US now, such capital-preferring investors are likely to prefer a bond such as the 0⅛% Jan 2031 (which costs about 90, so has a taxable yield of ≈ 0.14%. The current rules still allow such investors this 'option' against revenue collection.

If there is to be a big change in the issuance regime, this could be the moment to remove this option, very simply: all new US Treasuries would have the same coupon, fixed effectively forever. That value might well be 3%: all new Treasuries would pay a coupon of 3%. If market yields were 6%, tax on income would be no worse than halved, a smaller loss to the Treasury than if there were existing bonds with tiny coupons.

## Faster

There are lots of old securities, including four 30s per year. Such a policy, even if planted now, would take approximately a quarter century to reach fruition. The authorities might want this to happen faster.

†5 Switch auctions have been done by the UK, seven times, October 1999 to July 2001. The process is described in ¶14–19 of http://www.dmo.gov.uk/media/14563/cons130999.pdf ; the largest of those done in http://www.dmo.gov.uk/media/9795/off2811.pdf and http://www.dmo.gov.uk/media/13283/pr00044.pdf. As evidence of reversibility, what matters is only that switch auctions are possible.

It is possible for the Treasury to do a huge rearrangement, switching most of the old securities for the more-liquid new securities. This could be done in a manner that would actually happen, not at a loss for the UST, and not being a default. But, for the sake of brevity, not described here.

## Futures

The 'UXY' ultra 10y future on the CME, deliverables having "not less than 9 years 5 months and not more than 10 years of remaining term to maturity", specifies "Original issue 10-Year"[†6], and there are similar constraints for the other ≤ 10-year contracts. If there are to be fewer new 10s, the CME might wish to change the rules to allow delivery of old bonds. The CME could specify a minimum size for new 10s, and a larger minimum size for old securities. Contract specifications have changed before, e.g. for the 15–25y contract, June to Dec 2015 expiries, as otherwise only one ≤ 2031 Treasury would have been deliverable.[†7]

Futures are listed with almost nine months to the last delivery day, so a little notice would be needed, but only a little.

## Advantages

*Fewer and larger* has multiple advantages, and no disadvantages.

- It would be much more likely that a buy and sell would be of the same security, so would net.
- Hence Treasuries would impose a much smaller burden on the repo market.
- Bonds being larger, repo would be more available, especially during a crisis.
- Relatedly, Treasuries would use much less bank balance sheet.
- The market being cheaper to operate would encourage competition and so shrink the bid-ask spread.
- Ultimately, senior American economic policy makers would be less likely to give a speech worrying about "*questions about Treasury market structure, and … careful work going on to understand whether there is something we can do about this*". Such an absence would be very valuable.

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*London, November 2026*
*http://www.jdawiseman.com/*

†6 http://www.cmegroup.com/markets/interest-rates/us-treasury/ultra-10-year-us-treasury-note.contractSpecs.html
†7 http://www.cmegroup.com/trading/interest-rates/files/mar-15-jun-15-roll-analysis.pdf