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## US Treasury Bonds: fewer and larger

### Introduction

In the early 1990s the best-managed national debt in the world was the debt of the United States, followed closely by the French. Investment banks lauded the Treasury's management of its debt, and urged other sovereign authorities to "do as the US does". I know: five years of my life were spent in the employ of J. P. Morgan persuading the Bank of England to play catch-up.

By 2007 most countries had learnt from the US, and greatly improved the bonds they sold, the means of selling, and the workings of the market. But in the intervening 1½ decades the one country that has not significantly improved the management of its debt—other than the introduction of Treasury Inflation-Protected Securities—is the United States. This note describes the easiest of the several ways in which the US could improve the management of its debt: making long bonds larger in size by making them fewer in number.

### Bonds around the world

The US has resumed issuance of 30-year bonds, and issues one or two each year. Because such securities are so numerous, they are small. Let's compare with other countries.

The UK's 30-year, the 4¾% Dec 2038, is £14.9bn ≈ \$30bn, having been auctioned seven times. The UK Debt Management Office stopped reopening this gilt presumably because it was thought to be large enough to handle the trading size and frequency of the benchmark sterling-denominated 30-year. (Actually the UK DMO was wrong: this bond is too small for the interest-rate hedging and trading that needs to be done, so the work is increasingly done in swaps.)

Compare this gilt to the US. The 4½% Feb 2036 was opened twice, taking the total size to \$26.4bn. Presumably the Treasury thought that the trading size and frequency of the US 30-year was no greater than the UK 30-year. By the time of opening the 4¾% Feb 2037, it seems that even this was thought excessive: the Feb 2037 was stopped at a mere \$14.8bn. The new 5% May 2037 is only \$9bn, though will be reopened once, probably by about ≈\$5bn. A size of about \$15bn would be tiny for a German Bund or a British gilt; for the long bond of the world's premiere economic power, it is toy-town dinky size. And, more importantly, it invites market misbehavior: squeezes and manipulation in both cash and repo.

Other countries have learnt that modern markets entail much more trading than markets of ten years ago, and in much larger size:

- the German 4% Jan 2037 Bund is larger than the 2036 and 2037 Treasuries at €23bn ≈ \$31bn, having reached that size in four auctions;
- the French 4¾% April 2035 is €15.6bn ≈ \$21bn, having had six substantial auctions and several smaller reopenings;
- the Italian 4% Feb 2037 is €19.2bn ≈ \$26bn, again larger than the longest US Treasuries;
- the Dutch 4% Jan 2037 is bigger than the Feb 2037 Treasury at €12bn ≈ \$16bn, as is the slightly larger Belgian 5% Mar 2035;
- even the two Spanish long bonds 5¾% July 2032 and 4.2% Jan 2037, are larger than \$15bn.

However, the issuance habits of the United States Treasury suggest that it does think that there is greater need for liquidity in long-dated fixed income in US dollars than in:

- Yen, as 30-year JGBs are small, though the 20-year 2.1% Dec 2026 is of moderate size at ¥2.7trn  $\approx$  \$22bn;
- Canadian dollars, the 5¾% June 2033 being C\$13.4bn  $\approx$  \$12bn;
- Australian dollars, as years of budget surplus have shrunk Australia's debt;
- Denmark, South Africa, Taiwan, and Singapore, which all have long bonds much smaller than the US.

In most large developed countries the size of the 30-year bond is larger than 1% of annual GDP, and in the likes of the Netherlands and Singapore a little over 2%. Applying the 1% standard to the US would suggest a long-bond size of at least \$130bn.

### The merits of size

Larger bonds have several advantages over smaller bonds, and one disadvantage.

Larger bonds are traded more actively—there's more of each to trade. So a dealer's expected holding time between trades is shortened, reducing the dealer's risk and hence the quoted bid-ask spread. That reduced bid-ask spread further increases the velocity of that security.

Larger bonds are also harder to squeeze: there's more of each to buy. That gives market players greater confidence that the market is fair. In contrast, small bonds can more easily be owned or controlled by a small group of players. Such players might not be within the reach of US securities laws.

Consider two bonds, one of which has a dealing cost (the bid-ask spread, the difference between quoted buying and selling prices) of 10¢, and one of which has a bid-ask spread of 4¢. Also assume that long-term investors turn over their portfolio once every two years. So dealing costs an investor in the first bond an extra 3¢ per annum, which would be worth paying only if the bond yields more by at least 0.03% per year. Reducing the dealing cost should therefore reduce the yields, by about the reduction in the bid-ask spread in ¢ divided by the holding period.

But larger bonds do entail, at maturity, a larger single payment on a single date. How large can a 30-year safely be? On May 15<sup>th</sup> 2008 three notes mature, with a total size of \$87bn. Let's assume \$87bn to be the ceiling, as a proportion of tax revenues. At a conservative estimate, over the long term the nominal tax take will grow by something exceeding 4%, that being 2% inflation + 2% real growth. So a \$275bn 30-year will, at maturity, be a similar or smaller burden to the then taxpayers as the May 15<sup>th</sup> 2008 notes will be to us. Hence a 30-year security can safely be \$275bn: that is more than 10 times larger than current practice.

But what would happen if the actual GDP growth were far below the assumption. If so, this would be known several years before maturity. In each of those years the government could buy some amount of the bond by reverse-auction, in effect spreading the maturity over those dates. Or the government could switch-auction the bonds, repurchasing one bond at the same time as selling another—a technique used by the Swedes and then the Brits in the 1990s. By either or both methods, maturity of a large bond could be spread over multiple years. So a large bond, relative to several small ones, does not create a problem for the next generation.

Of course this should not be taken to the extreme of having only a single bond. Investors have liabilities across maturities, so need some short-dated bonds, and securities with maturities not far from 10, 15, 20, and 30 years. But in the five-year span between February 2026 and February

2031 there are twelve bonds with an original maturity of 30 years! What on earth for? What possible liability could have been hedgeable with a 6½% Feb 2027 that could not have been hedged with the 6½% Nov 2026? And what liability could be hedged with the May 2037 that cannot be hedged with the too-small Feb 2037? Other countries have multi-year gaps between 30ish-year bonds that are reopened half-a-dozen times: so should the US.

### What has kept US bonds so small?

There are several forces that might have caused the Treasury to keep its bonds numerous and small:

- **OID:** the most obvious reason for the small size of long bonds is the poor design of the Original Issue Discount rule.

The intent of the OID rule was good. If prevailing yields are, say, 5%, and an issuer sells a bond with a 2% coupon, at a sub-par price, the effect is to reduce the purchaser's taxable income by moving it into capital gain that is less taxed or more flexibly taxed. Quite rightly, the rules should penalize this.

To help pin down the correct form of the rule imagine that, years ago, the Treasury had issued at par a perpetual bond with a 2½% coupon, now yielding 5% so costing \$50. What would be the tax loss from reopening this bond, rather than creating a new par 5% perpetual? Investing \$1mn in the old 2½% generates a taxable income each year of \$50k. And investing \$1mn in a new 5% bond would also generate a taxable income each year of \$50k, exactly the same. So reopening the old low-coupon bond, rather than creating a new par bond, would cause zero tax loss. But the OID rules see a change in the yield of a factor of more than 1.1, so penalize a reopening. Thus the OID rules needlessly restrict reopenings of long bonds. A better test, though slightly more mathematical, would ask whether or not the running yield is less than the redemption yield minus ½%, where running yield = coupon ÷ price. Also, no purpose has ever been served by the requirement that reopened bonds be less than a year old, and it needlessly restricts multiple reopenings over many years.

Of course a 30-year isn't quite a perpetual, but its principal is so far away that it isn't so different. The better formula would allow the reopening of a 5% 30-year that yielded less than 9.48%. But for a 2-year the better formula is correctly restrictive: to be reopened a 5% 2-year bond must yield less than 5.56%.

- **Misunderstanding the role of a calendar:** the United States Treasury invented the auction calendar, which was a huge improvement in debt management. Even in the early 1990s the Irish, the Brits, and others lacked a calendar. Instead, at very short notice the central bank would announce that it was selling 5s, or 10s, or some other maturity. Market participants presumed these decisions to be made, at least in part, on the basis of market prices: in other words, the central bank was selling that maturity it thought most overpriced. So why would one want to buy it? Market participants compensated by cheapening the whole yield curve.

The US solved this problem: commit in advance to selling a particular maturity. Then, on the day, the sale of that maturity says nothing disparaging about its price. At the time this was a great policy innovation by the United States.

But it now seems that the calendar has become an ends rather than a means. The Treasury seems determined to specify everything, far in advance. This is not needed. An auction calendar could perfectly satisfactorily have stated that the Treasury will be selling "the Feb

2037 if the OID rules permit, otherwise a new higher-coupon May 2037". That would be enough for the market to know that the Treasury is not using inside information to swindle investors, but would have given at least some chance of reopening the Feb 2037.

- **Dealers' advice:** I am not privy to the private communications between dealers and the Treasury. But one can guess that dealers say that they prefer smaller more numerous bonds. The dealers probably don't say that smaller securities are more amenable to being pushed around—short-term price manipulation. The dealers also probably don't say that having more numerous smaller securities allows them to charge wider bid-ask spreads. Given the noise in late 2006 about the manipulation of the repo market, the Treasury should be doing its bit by not creating tiny (<\$15bn) 30-year bonds.
- **STRIPS:** another excellent policy innovation by the US was STRIPS. And because the US has traditionally had two types of long bond (those paying in February/August, and those paying in May/November) the Treasury seems determined to keep both going. But liquidity in STRIPS is falling: market participants increasingly hedge structured exposures with swaps (which weren't liquid in the heyday of STRIPS); there are fewer market-makers; and less turnover. The same symptoms can be seen in the French STRIPS market, the only other such market ever to achieve substantial liquidity. If the tradability of the US STRIPS market were to continue its current decline, it could tip into being irrelevant.

The last coupon of a \$20bn 5% 30-year has a present value of about \$114mn. This is miniscule. The problem can be alleviated by having as many coupons as possible being fungible, so increasing the maximum possible issue size. But the Treasury seems determined, unwisely determined, to maintain liquidity in long-dated strips from both the February/August and May/November series (why else create a new May 2037, other than because it is the "turn" of the May/November cycle after two February long bonds?). Reopening both series increases the balance sheet usage of dealers, and reduces liquidity in long-dated cashflows. It brings forward the day in which STRIPS cease to be relevant. Instead the Treasury should choose one series—it doesn't matter which—and make all new long bonds on that series.

## What to do?

So, what should the US Treasury do?

- Rewrite the OID rule to test only the difference between redemption and running yields;
- Issue far fewer long bonds, that are far larger, perhaps \$100bn to \$250bn, and that are all on the same payment dates.

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