

III. Special features

Benchmark tipping in the money and bond markets

The possibility that the stock of outstanding US Treasury securities may shrink significantly raises the question of how the broader US dollar fixed income market might operate in their absence. Market participants have come to rely heavily on US Treasury securities as benchmarks for pricing other securities, as means of hedging and positioning in both duration and volatility, as bases for futures market contracts and as collateral for secured borrowing.

One approach to answering this question reaches back almost a century: to examine the workings of the US bond market in the period before the First World War when there was little in the way of government debt. This earlier era, however, lacked many features that are now important to the functioning of financial markets, such as mortgage-backed securities, futures and options. As a result, it may be hard to draw reliable inferences from this earlier experience. This special feature approaches the question by examining the changing roles of Treasury and other obligations in the dollar *money market* over the last generation for clues as to how their relative roles might evolve in the dollar *bond market*. This approach considers a time when the modern instruments of finance were in use.

The dollar money market followed a “tipping” process ...

... in which participants shifted to another benchmark

The principal finding of this special feature is that private instruments eclipsed government paper as a benchmark in the dollar money market over the last two decades even as government debt grew rapidly. The shift followed a “tipping” process in which market participants found it advantageous to use first one, and then another, instrument in line with the preponderant choice of other market participants. More recently, the bond market has shifted away from its reliance on government securities and might well have continued to do so even had there been no reduction in the stock of outstanding US government paper. On this view, therefore, any sustained reduction in the supply of the US Treasury’s obligations would only accelerate this shift.

Benchmark tipping in the money market

In the dollar money market, the US Treasury bill once enjoyed a pre-eminent role as a basis for pricing, as a means of hedging and positioning, and as a

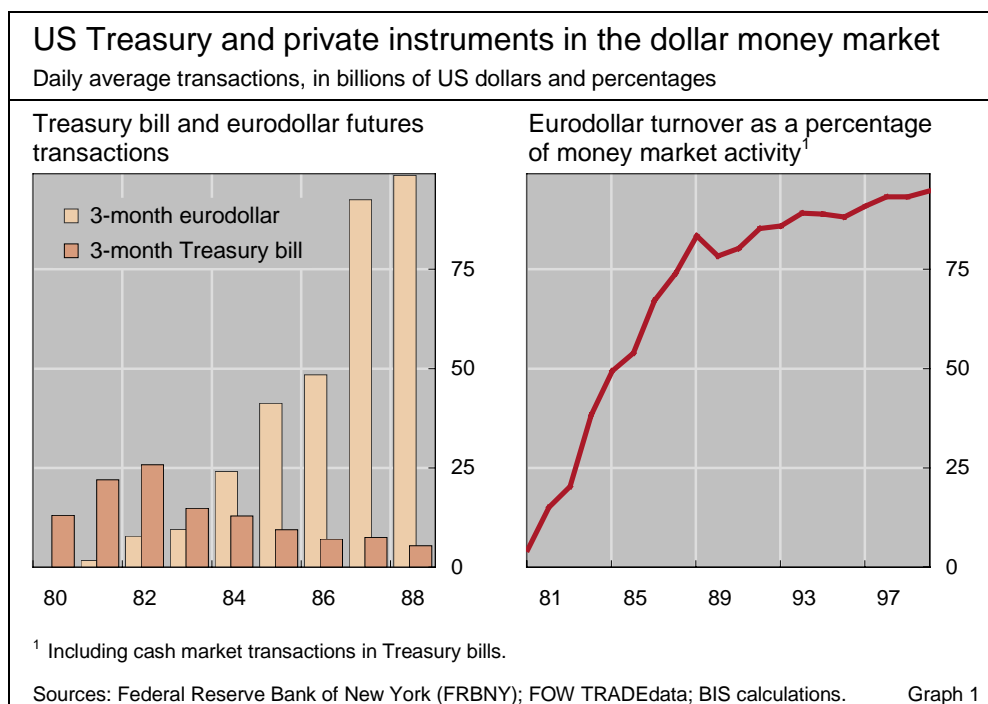
basis for futures contracts. Twenty-five years ago, on top of a well developed cash market for Treasury bills, a futures contract on three-month Treasury bills was introduced. This contract proved a great success and by the summer of 1982 daily volume in bill futures exceeded cash market transactions in Treasury bills by reporting dealers.

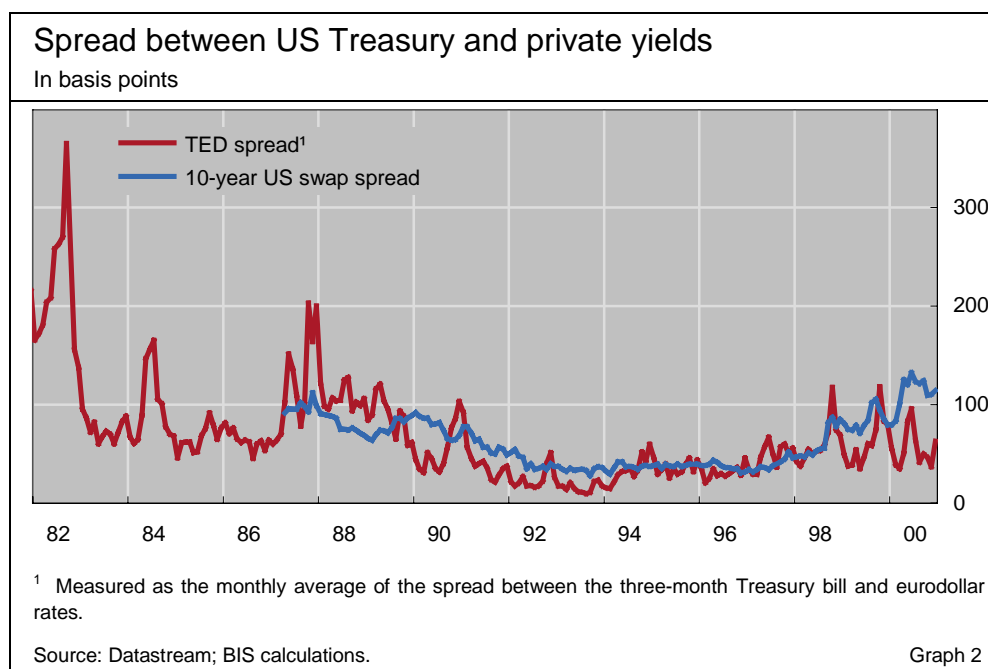
In 1981 a futures contract on a so-called “run” of large US bank certificates of deposit was introduced. The contract called for cash delivery of the certificates of any of the top 10 banks. This contract enjoyed initial success but, after August 1982, fell victim to investors’ drawing sharper credit distinctions among banks in the wake of the developing country debt crisis. A variant of Gresham’s law set in, whereby the certificates of the worst considered banks could be bought most cheaply and were thus routinely delivered. As a result of this process in which bad credit drove out good credit and events in Latin America influenced contract pricing, the contract fell out of use.

In the spring of 1982, however, trading in a better designed futures contract on bank rates began in Chicago. Based on a trimmed average of posted rates of a panel of top-quality international banks located in London, the eurodollar contract allowed for cash settlement. In September 1982 a similar contract began to be traded in London, albeit with a provision for delivery at settlement as well as cash settlement (to keep from running afoul of UK gaming laws). Trading in these contracts grew slowly, boosted in the case of the Chicago contract by the proximity of its trading pit to that of the Treasury bill contract. This proximity eased the trading of the so-called TED spread, the spread between the Treasury bill rate and the eurodollar rate. But trading in the eurodollar contract took off in 1984, and that year it surpassed trading volume in the Treasury bill contract (Graph 1, left-hand panel).

Trading in a eurodollar contract began in Chicago in 1982 ...

... surpassing the Treasury bill contract two years later





The eurodollar rate tracked interest rates on private securities better

This overtaking was particularly surprising in that the Treasury bill contract benefited, unlike that for the eurodollar, from having an actively traded underlying asset. Moreover, the bill contract possessed a stronger credit grounding in the US Treasury's tax receipts and had already established itself before the appearance of its competitor. What factors then accounted for this eurodollar contract displacing the gilt-edged US Treasury bill as the most used reference rate in the dollar money market? The answer seems to be that the unique credit standing of the Treasury bill ultimately worked against it. A bank seeking to manage its short-term match of assets and liabilities, or to position vis-à-vis general interest rate expectations, found in eurodollar rates a much closer approximation of its own marginal borrowing costs and lending rates than US Treasury bill rates could provide. Similarly, a dealer seeking to hedge the value of a portfolio of short-term instruments like certificates of deposit, banker's acceptances and commercial paper realised that the eurodollar rate tracked interest rates on these private securities better than the Treasury bill rate. Hedging a portfolio of private securities with a short position in Treasury bill futures exposed the dealer to so-called basis risk, that is, to a widening of the TED spread.

A flight to quality in 1984 caused hedges using Treasury bills to fail

Traumatic episodes in the money market highlighted the risk of using a government rate as a proxy for private rates. In the spring of 1984, the run on Continental Illinois provoked a flight to quality that led to a sudden widening in the TED spread (Graph 2). At that time, long positions in private paper approximately hedged by a short position in Treasury bills misfired and produced losses on both sides as the price of private paper fell while that of Treasury bills rose.

Sudden large jumps in the Treasury-eurodollar spread could also reflect demand and supply imbalances. In the spring of 1987, a strong bid for bills,

from central banks that had just intervened to support the dollar, met reduced supply from the US Treasury in response to unanticipated strength in tax collections. Episodes of this sort forced market participants to re-examine their traditional practices to such an extent that it undermined the strong liquidity advantage of the established Treasury bill contract.

This substitution of a private for a government instrument tended to reinforce itself in a process that can be termed “benchmark tipping”. Tipping denotes a strategic situation in which the benefits of a given choice to one player depend in a positive manner on a similar choice by other players.⁸ In this case, as each bank or dealer switched from using the Treasury bill contract to the eurodollar contract, the latter gained depth and liquidity and became more attractive for other players to use. This process stopped short of going all the way, in the sense that the eurodollar contract superseded the Treasury bill in the futures markets but did not drive it entirely out of existence (Graph 1, right-hand panel).⁹

The dynamics of benchmark tipping

An interesting question is to what extent this coexistence should be viewed as a market outcome or as the result of legal and institutional impediments that favour the Treasury bill. For instance, student loans supported by the US Student Loan Marketing Association continued to be priced off Treasury bill rates until as recently as 1999, when banks finally prevailed on the US Congress to base the student loan rates on a private rate.¹⁰

Benchmark tipping in the bond market?

Should one expect the benchmark in the bond market to tip towards a private rate? The discussion above suggests that the answer to this question depends on the availability of a robust private benchmark and on the occurrence of traumatic movements in Treasury-private spreads.

Tipping in the bond market requires a robust private benchmark

There would be little prospect of a private instrument displacing Treasury notes and bonds if there were no standardised private rate. What is needed is some convention for the longer end of the yield curve, akin to a trimmed

⁸ Thomas C Schelling, *Micromotives and Macrobehavior* (New York: Norton, 1978). See also BIS, *70th Annual Report* (Basel, June 2000), pp 116-118.

⁹ Marcia Stigum, *The Money Market*, 3rd ed (Homewood, Illinois: Dow Jones-Irwin, 1990), page 757, posed the question “Bill Futures: A Dying Contract?”.

¹⁰ In response to requests from banks, the US Congress included in the Higher Education Amendments Act of 1998 a directive to the Congressional Budget Office to study a change in the benchmark rates on student loans from Treasury bills to the eurodollar (Libor) or another private rate. Then, in 1999, in the Ticket to Work and Incentives Improvement Act, Congress enacted a temporary change in the benchmark until 2003 to the three-month commercial paper rate, which tends to track Libor closely. See Congressional Budget Office, “A Framework for Projecting Interest Rate Spreads and Volatilities”, Memorandum, January 2000. The choice of the three-month commercial paper rate as the base rate for student loans was an odd one. That the three-month commercial paper rate tracks Libor is about the best that can be said for it: Stigum, op cit, page 728, notes that “a futures contract for 90-day, A-1, P-1 commercial paper never attracted much interest because the real market in commercial paper is for paper with an original maturity of 30 days or less...”.

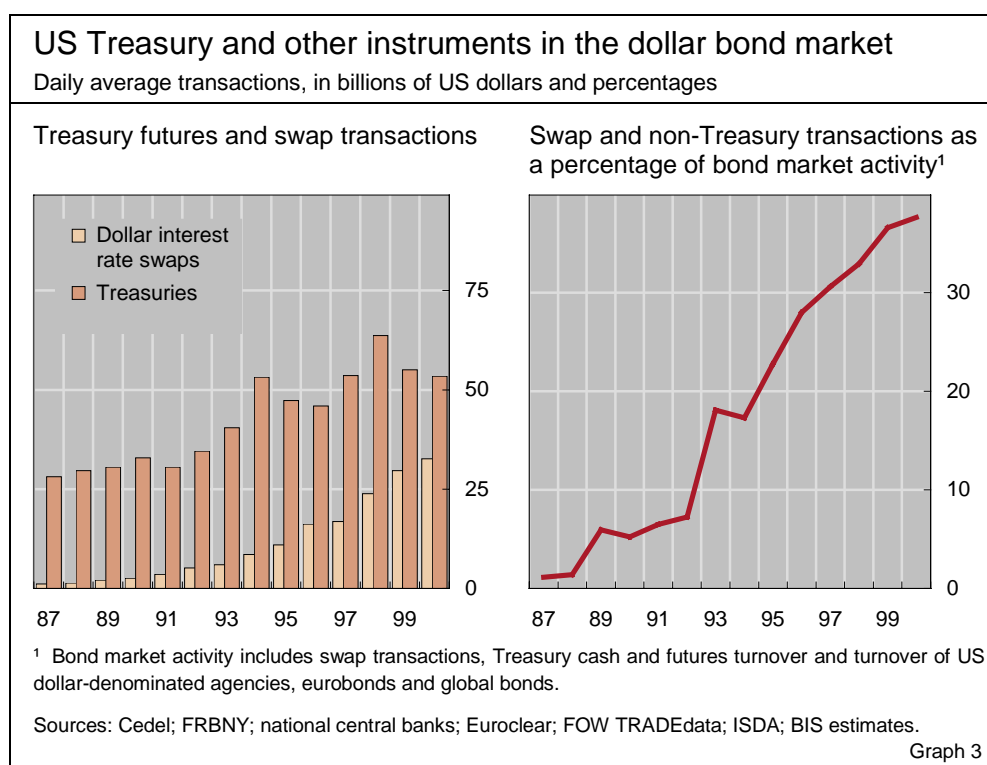
average of three-month rates posted by a panel of banks, which offers a homogenised, high-quality private credit benchmark to the dollar money market. Long-available averages of yields on outstanding private high-quality bonds do not quite measure up. Since the mid-1980s, however, the over-the-counter derivatives market has provided an attractive alternative: the fixed rate that major banks are willing to trade against eurodollars in an interest rate swap.

The interest rate swap rate has advantages over an average of bond yields

The interest rate swap rate has several advantages over an average of yields on outstanding bonds. Since new swaps of a given maturity are traded every day, their maturity is constant from day to day, unlike the variable average maturity of any index of outstanding bonds. Likewise, new swap rates are quoted at par and thus are spared the tax and accounting effects that enter secondary market prices for bonds as they come to trade at a discount or premium.

The LTCM episode highlighted the risk of hedging with Treasury contracts

Recent years have also seen episodes in the bond market analogous to the Continental Illinois trauma in the money market. In particular, the Long-Term Capital Management episode in 1998 delivered a body blow to the practice of hedging private instruments, like mortgage-backed securities or corporate bonds, with short positions in Treasury notes or bonds, whether in cash or futures markets. Once again, with the hedge being only approximate, such portfolios ran up losses on both the long position in private securities and the short position in government securities. More recently, announcements of Treasury buybacks have also tended to widen spreads, just as demand and supply imbalances earlier altered spreads in the money market.



Benefiting from a serviceable benchmark and episodes of traumatic spread widening, private instruments are gaining on US Treasury securities in the bond market. In other words, there are signs that the benchmark is tipping from Treasury paper to the swap. Trading in swaps (and options based on them, or “swaptions”) has risen relative to futures and options trading in Treasury notes and bonds (Graph 3, left-hand panel). Widening the net to include cash market transactions gives qualitatively similar results (Graph 3, right-hand panel). It is particularly noteworthy that transactions in coupon-bearing US Treasury securities peaked in 1998, while those in private instruments have continued to rise. Comparing the left-hand panels of Graphs 1 and 3, on the one hand, and the right-hand panels, on the other, suggests that the process in today’s bond market has reached a stage similar to that in the money market in the early- to mid-1980s.

There are signs that the benchmark is tipping from Treasury paper to the swap

As in the money market, bond market players want to trade where others trade.¹¹ Each market participant who gives up using US Treasuries to hedge private instruments subtracts liquidity from the Treasury market and adds it to the swap market, raising the incentives for other market participants to do likewise.

Each participant who shifts raises the incentive for others to do likewise

Looking forward, private instruments in the bond market may still labour under a greater disadvantage than did private instruments in the money market in the early 1980s. In particular, despite some initiatives to trade swaps on an organised exchange, swaps are still traded over the counter. One explanation is that the customer demands the bespoke quality of tailor-made swaps. While there is truth in this explanation, there is no doubt that better rated banks have also resisted moving swap trading from a decentralised telephone market to a centralised exchange. A centralised market structure would homogenise the credit standing of traders and thereby erode the competitive advantage of the better rated, that is the current preference of customers for a few relatively high-quality counterparties given that many contracts run for years. (The most active swap dealers may also benefit from proprietary information on order flows.) Despite the spread of collateral requirements that allow lesser credits access to the market, the swap market probably labours under higher transaction costs and remains less liquid than it might be were swaps traded on an exchange.

Swaps are still traded over the counter ...

Ongoing global consolidation in banking may, however, make it harder to keep swaps traded strictly over the counter. Credit-conscious customers are losing their ability to diversify counterparty credit risk, particularly in their

¹¹ The overview paper to the CGFS report, *Market Liquidity: Research Findings and Selected Policy Implications* (Basel, 1999) discusses the tendency for liquidity in government bond markets to be concentrated in benchmark issues (see especially pp 15-16). In one of the papers forming part of that study, Michael Fleming and Asani Sarkar, "Liquidity in U.S. Treasury spot and futures markets", examine the concentration of liquidity in specific maturities in the US Treasury markets, while Hideaki Higo, "The change of liquidity in the life cycle of Japanese government securities", finds that Japanese government bonds that started their lives as benchmarks continue to enjoy higher turnover well after losing benchmark status.

... but global consolidation in banking may lead to trading on an organised exchange

derivatives transactions. The increasing concentration of swap books may, ironically, result in strong pressure for that ultimate concentration of trading – an organised exchange. In such exchange arrangements, counterparty risk is of course taken by the exchange itself subject to sharing arrangements with all the exchange's participants.

Conclusion

Any sustained reduction in government debt would only increase the reliance on private benchmarks

The concern that modern bond markets cannot function efficiently without government securities, including those of the US Treasury, is probably misplaced. The US Treasury bill has already yielded its pre-eminence in the money market to bank liabilities, and the same process may be in train in the bond market. The central role of government debt may prove no more than a legacy of wartime finance as peacetime markets naturally tip towards reliance on private benchmarks. Viewed in this manner, any sustained reduction in the stock of government debt would only accelerate a process already well under way.

Even if this view is accepted, however, difficult questions remain. Could a flight to quality in an environment of a much reduced supply of government securities lead to a more exaggerated widening of public-private spreads, with adverse implications for the solvency of portfolios still exposed to this spread risk? And in the event of a disappearance of government securities, would the modern run from private to public paper revert to the previous pattern of a run from private paper to currency or specie?