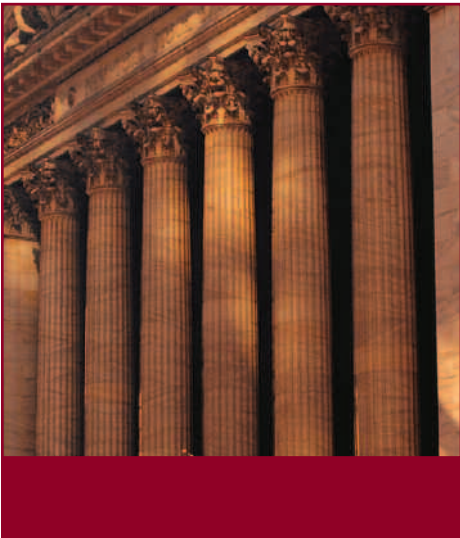


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The Vast Market for 30-Year Treasury Bonds (and Bond Futures)

By Galen Burghardt
and William Hoskins

Back in 2000, when budget surpluses were rolling in and we thought we were flush as a nation, the U.S. Treasury began to reduce its long-term borrowings. First the Treasury began buying back 30-year bonds, and then, in October 2001, decided to stop issuing long bonds altogether.

This was quite a shock to financial markets. Although many market participants had already switched to the 10-year note as the benchmark instrument on the Treasury curve, the 30-year bond still held a central place in the fixed income market. In fact, the U.S. was the only capital market in the world with an active 30-year bond market, and that market still served as the basis for one of Chicago's most active and successful futures contracts. So even though all could see that the outstanding supply would continue for a number of years, Treasury's decision to suspend issuance seemed to mark the end of an age.

As we now know, those rumors of the long bond's demise were greatly exaggerated. We are back to running huge federal budget deficits, and the Treasury needs to borrow. After several months of consultation with market participants, the Treasury announced in August that it would resume issuing 30-year bonds twice a year, starting in February 2006.

The Treasury's decision was well received all around, and with good reason. From a pure financing perspective, borrowing for 30 years at 4.5% makes a lot of sense. Yields are low, and the yield curve is very flat. So not only can taxpayers obtain low cost funding for a very long horizon, they don't have to pay a premium to do so. In this vein, much of the favorable press focuses on the wisdom behind tapping a new funding point on the curve and the broader diversification of borrowing that will be available to the Treasury.

We think a more interesting story lies in the fact that the federal government can do the private sector a potentially huge favor by issuing large quantities of high quality long-term debt. This is because private pension plans may well find it necessary to obtain better hedges for their liabilities. And if they do, they will discover the outstanding supply of good hedging bonds is far too limited for their purposes.

Huge Duration Mismatch

The story starts with the efforts by policy-makers in Washington to force pension funds to more accurately report their assets and liabilities. The White House is backing a proposal to require pension funds to mark their liabilities, and this proposal has been incorporated in the Pension Security and Transparency Act now under consideration in the Senate. Accountants likely will follow with their own rule changes to improve pension security and transparency.

The idea behind these efforts is that disclosing the true mark-to-market state of pension plan funding will encourage corporations to insure that their pension assets and liabilities track one another more than they have historically. If they do not match assets to liabilities, then a host of interested parties—shareholders, auditors, regulators, and even plan participants—would see that funding ratios (that is, the ratios of assets to liabilities) often swing wildly as the present value of liabilities goes in one direction while the value of assets go another.

Given that a lot of the volatility in pension funding comes from movements in 30-year interest rates, and given the ultra-long liabilities of pension funds, pension funds face a large exposure to interest rate risk at the long end of the curve. In theory, adding a significant amount of 30-year bonds to their portfolios would go a long way to managing this risk. The reality, unfortunately, is that the potential demand for long duration would quickly dwarf the available supply of 30-year bonds.

While it complicates any discussion of pension fund liabilities, it is important to note that corporate pension liabilities fall

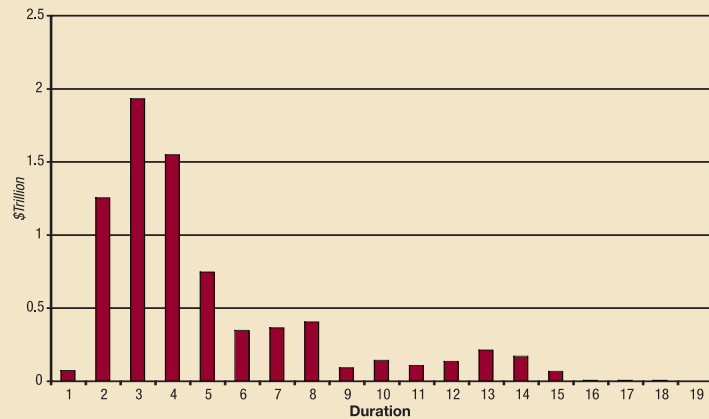
into two types: those that are static—that is, those whose nominal values are known today and will not change with time—and

those that are inflation sensitive. The inflation sensitivity comes from the fact that although standard corporate pensions are

Exhibit 1

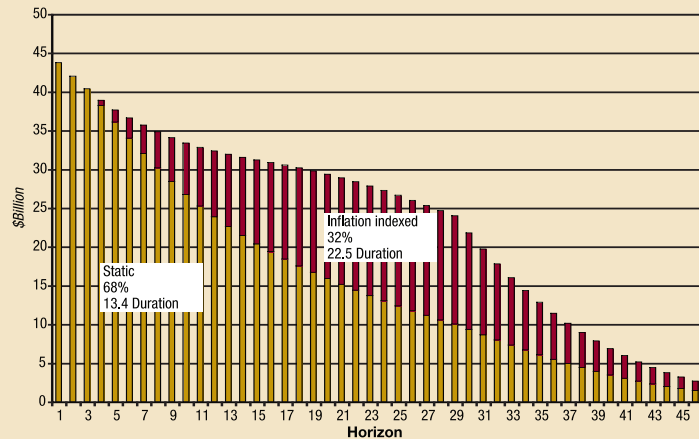
Investment Grade Bond Duration

> 1yr to maturity



Pension Obligations of S&P 500 Corporations

(Present values and durations of static and inflation-indexed cash flows)



Source: Mellon Capital Management

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“fixed”, the total liability is not entirely known until retirement because it depends on some form of final salary. Up until the day of retirement, increases in salary from inflation (as well as merit) will increase the final fixed monthly pension.

The importance of the distinction is shown in the attached graph in Exhibit 1, which shows the present values of these cash flows and their corresponding modified durations. This graph was produced using data reported for S&P 500 pension plans com-

Compare the value and duration of pension fund liabilities with the value and duration of the outstanding supply of investment grade bonds, as also shown in Exhibit 1. This covers not only Treasury securities but also agency paper, corporate bonds, mortgage-backed securities and various other types of debt, and covers all maturities down to one year. If corporate pension plans all rushed to the market to find assets to match their liabilities, they would come up short because of the lack of good duration matches. There are

In Exhibit 2 we take a closer look at this problem. The table shows three possible pools of bonds for hedging pension funds’ static cash flows. Of these, the best duration match would be longer-term government securities (shown as 20+ governments, which include Treasury and agency bonds over 20-year maturity). The next best would be 10+ government and corporates. The worst would be the third category, which includes all types and maturities of investment grade bonds, as represented in the Lehman Aggregate index. With an average duration of less than five years, the supply in this category would a poor match for pension fund liabilities.

Based on our estimates of the likely impact of the pending mark-to-market proposal, pension plans would need \$753 billion of the 20+ government bonds to match the duration exposure of their liabilities. This is more than three times the available supply. If the pension funds turned instead to the second pool, the supply would be larger but still well short of their needs, and the tracking error widens. As for the third pool, there certainly are plenty of investment grade bonds to go around, but the tracking error between assets and liabilities would be much, much larger than the better hedges would provide.

To hedge the inflation-sensitive cash flows, the best hedge would be provided by longer term TIPS (shown as 10+ TIPS). Plans would need \$467 billion of these bonds for hedging purposes, which is more than six times the current outstanding supply.

The picture painted here actually tells only part of the story. Corporate pension plans represent only one group of hedgers. The actual shortage of long bonds likely is even worse because public pension plans, life insurance companies, and aging baby boomers (such as Galen Burghardt) need long bonds as well (and especially long TIPS for cost-of-living hedging).

The Treasury should view this long-bond shortage as an opportunity to meet the legitimate risk-management needs of its domestic investors.

bined with U.S. demographics and standard mortality tables.

As the graph shows, roughly two-thirds of the total liability is accounted for by the static cash flows and has a duration of 13.4 years. The other third stems from the inflation-sensitive liabilities and has a duration of 22.5 years. The inflation-sensitive cash flows have much longer duration because they come from the ultra-long cash flows for younger workers. These workers’ final salary and pension payment are highly sensitive to the level of inflation over their working career.

certainly lots of Treasury and other bonds available, but they are not the right maturities to match pension liabilities. Pension plans with current active employees have very long-dated obligations, so 30-year bonds are the ideal asset to match the fixed portion of liabilities. The inflation-sensitive part of liabilities could be matched by the longest Treasury Inflation-Protected Securities, which are currently 20 years. The pension needs for these long bonds are so large, however that they dwarf the available supply of long bonds and long TIPS.

Exhibit 2

Scrambling for Duration

Market	Market value outstanding (\$ bil)	Needed to duration hedge	Hedge as a % of market	Tracking error
Static Cash Flow Hedge				
20+ governments	219	753	344%	0.10%
10+ governments and corporates	855	902	105%	1.40%
Lehman aggregate	8,283	2,368	29%	3.70%
Inflation Sensitive Cash Flow Hedge				
10+ TIPS	77	467	606%	1.90%
TIPS	274	1,216	444%	4.70%

A Land of Opportunity for the U.S. Treasury

The Treasury should view this long-bond shortage as an opportunity to meet the legitimate risk-management needs of its domestic investors. To be sure, foreign central banks have been the biggest customer for Treasury bonds and notes, but they do not want 30-year maturities. As every corporate treasurer is aware, the best place for your securities is in the hands of long-term investors who want the risk and credit characteristics of the secu-

Estimates: Mellon Capital Management

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ity. A distant second is to place them with investors who are parking their dollars for the short term. Pension funds are stable long-term investors, while foreign central banks may change their minds about Treasury bond holdings at any time. Catering to your long-term customers is always a good strategy whether in business or in bond issuance.

We might note, too, that if the Treasury fails to fill this gap, it could serve as a financing windfall for other countries. Germany or Japan, for example, could issue long-term dollar denominated bonds and hedge the proceeds back into their home currencies. On the other hand, corporations cannot fill the gap. As experience has taught us, no corporation can promise high quality credit for 30 years. The mighty have fallen left and right, so it is left to sovereign issuers that

have the full backing of their tax paying publics to maintain their credit standing.

Implications for Treasury Futures

As Galen Burghardt and Terry Belton chronicle in *The Treasury Bond Basis*, the long-term Treasury bond contract was eclipsed in recent years by the 10-year Treasury note contract. Depending on how you keep score, the 10-year contract passed the bond contract either in 1999, when its open interest exceeded that of the bond contract, or in 2002, when its daily trading volume passed that of the bond contract. (See Exhibit 3.)

The reintroduction of the 30-year bond will almost certainly breathe some new life into the bond futures contract. Not that the new issues will be especially relevant to the

deliverable set for some years to come, but the presence of newly issued bonds will almost certainly increase liquidity and trading in the long end of the market.

In addition, if the proposals now under consideration in the Senate become a reality, or if other regulations force corporate pension funds to take duration hedging more seriously, there may be a surge in the use of bond and note contracts for outright hedging purposes. It is well worth noting that while pension funds must cope with vague IRS regulations on "unrelated business income tax" to use leveraged cash bond positions as a way of adding duration to their assets, they are explicitly allowed to use swaps and futures. That is, they can receive fixed on long-term swaps, or they can go long bond futures.

Many pension plans also have very good relationships with their current managers and like their asset allocation mix. These plans can simply add bond futures or swaps to increase the duration of their assets to match their liabilities.

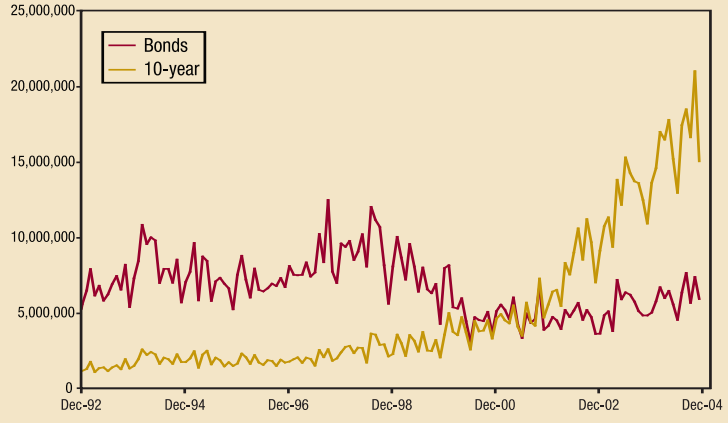
This would be huge for the Treasury futures market, although it seems unlikely that it would restore the long-term Treasury bond contract to its original dominant place in the Treasury futures universe. Bond futures may be useful for creating duration, but as Magritte might have said, they are not bonds. Those who short bond futures to pension plan hedgers would need a place to hedge. And until the Treasury has had a chance to roll out a few hundred billion dollars of the 30-year bond, the chief hedging market will remain the market for Treasury notes 10 years and under.

It is also worth pointing out, if pension plans are required to more closely match their assets and liabilities, it seems highly likely that the resulting buying pressure will flatten the Treasury yield curve for years to come. The Treasury curve might well become inverted, with yields on longer term securities actually falling below shorter term securities. That is what has happened in the U.K., where hedging by pension plans is required. ■

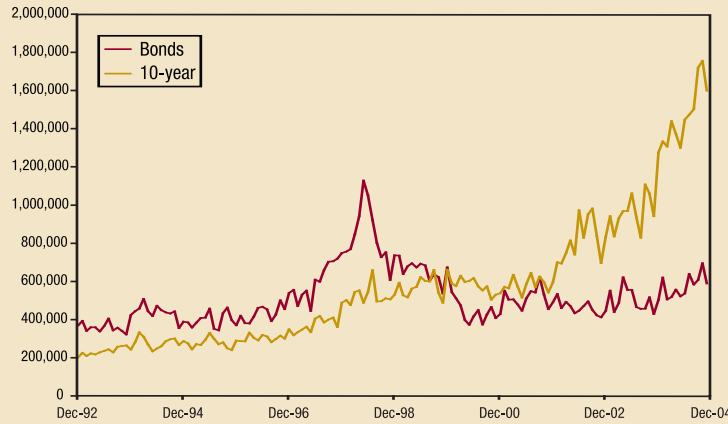
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Exhibit 3

Treasury Futures Volumes



Treasury Futures Open Interest



Source: Futures Industry Association