TERRY

Bond Market Update – March 2022
April 4, 2022

Terry Group A-Grade Corporate Bond Yield Curve for Valuing Long-Duration Insurance Contracts

The valuation of long-term insurance policy benefits will shift to a current-market valuation basis for large public companies in 2023, with restated liability figures generally required as of the two prior year-ends.

Current market discount rates will be based on an "upper-medium grade" fixed income yield, which is broadly interpreted to mean A-grade corporate bonds.

In valuing future policy benefits, the new FASB rules further specify that insurers reflect the duration characteristics of the liabilities and use valuation rates that maximize reference to observable bond data.

Constructing an Appropriate A-Grade Bond Portfolio

Adhering to these new standards entails an assessment of relevant bond yields across the full range of maturities. The most direct way to reflect market rates is to develop a complete yield curve from a portfolio of A-grade bonds, applying year-by-year rates developed from that curve to discount future policy benefits.

Constructing a curve from market data requires addressing a number of technical and methodology considerations, including:

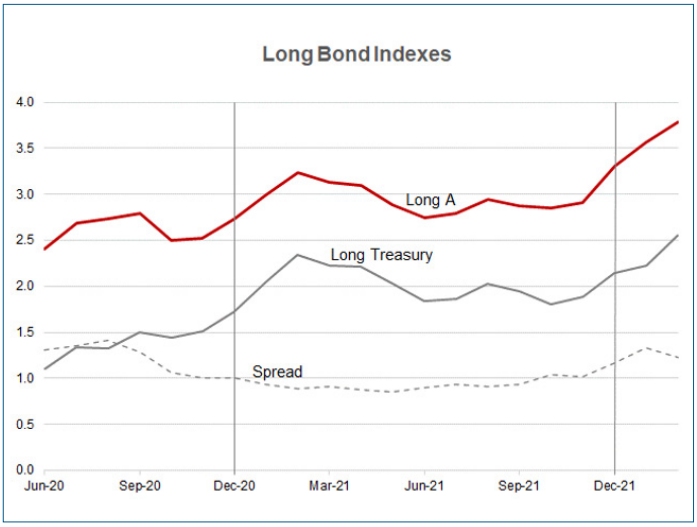
- range of credit ratings by different rating agencies
- minimum issue size to ensure credible bond trading/pricing
- inclusion/exclusion/adjustments for bonds with call features and other embedded options
- inclusion/exclusion of private placement, quasi-government and less broadly-traded bonds
- relative quality/appropriateness of pricing sources and timing for end-of-day price measures
- potential curve-fitting approaches, with varying emphasis on tightness of data-fit vs. smoothness
- extrapolation of long-end rates, beyond the range of credible bond data (a critical factor since payments for many insurance products extend well past 30 years).

Ensuring acceptance by auditors will require that the yield curve be comprehensively documented, consistently applied, and provide results closely reflective of current capital markets and market changes across time.

Bond Market Update

Monitoring generally available market information such as bond index averages is necessary to ensure market consistency. Any variation in model vs. market results should be evaluated and rationalized.

	Corp A	Treasury	Spread
3/31/2021	3.78	2.55	1.23
2/28/2022	3.56	2.23	1.33
1/31/2022	3.31	2.14	1.17
12/31/2021	2.91	1.89	1.02
11/30/2021	2.85	1.81	1.04
10/31/2021	2.87	1.94	0.93
9/30/2021	2.94	2.03	0.91
8/31/2021	2.79	1.86	0.93
7/31/2021	2.74	1.84	0.90
6/30/2021	2.88	2.03	0.85
5/31/2021	3.09	2.21	0.88
4/30/2021	3.13	2.22	0.91
3/31/2021	3.23	2.34	0.89
2/28/2021	2.99	2.05	0.94
1/31/2021	2.73	1.72	1.01
12/31/2020	2.52	1.51	1.01
11/30/2020	2.50	1.44	1.06
10/31/2020	2.79	1.50	1.29
9/30/2020	2.73	1.32	1.41
8/31/2020	2.69	1.34	1.35
7/31/2020	2.41	1.10	1.31
6/30/2020	2.80	1.32	1.48



Sources: Bloomberg Barclays Long A US Corp, US Treasury Long Indexes

Long corporate bond yields have surged by 90 basis points over 2022's first quarter, following an upward move of about 40 basis points in 2021. The long Treasury yield moved up slightly less over the same period, resulting in a 20-basis-point increase in credit spread.

As has been widely reported, recent long bond yields are strongly impacted by a shift in monetary policy aimed at dampening increases in inflation expectations. Corporate rates are, as always, also impacted by cyclical vagaries in the demand for capital funds. Both elements are currently acting to push recent rates upward, in the context of a strong economic recovery and high recent year monetary supply growth.

However, even with recent increases, yields are still not particularly high in a historic context, and analysts generally do not expect a return to high rates over the longer term, given the maturation of the economy and the continuation of at least some elements of expansionary government monetary policy.

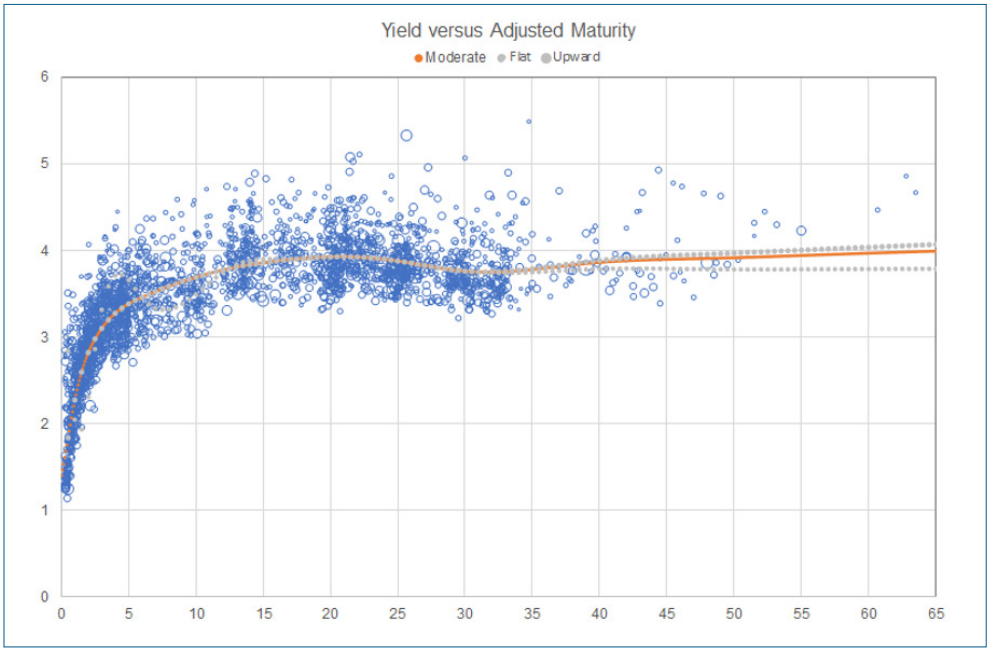
Building and Applying a Yield Curve

The following exhibits illustrate the results of an A-grade yield curve model developed as of March 31, 2022.

After filtering the A-grade bond universe for grading, optionality and other factors, the portfolio consists of over 2,800 bonds. These are arrayed across maturity groups; a curve is then fit to that array, with a goal of reflecting the mean/median yield for each maturity group. Note that two technical adjustments are made in the course of fitting the curve:

- The fitted curve is modified to the extent necessary to ensure a relatively smooth pattern of yields, with these adjustments very closely controlled to ensure that the overall curve maintains an accurate representation of mean/median yield levels.

- The bonds are characterized, and maturity group averages determined, based on "adjusted" rather than nominal maturities. These adjustments are necessary since the fitted curve is based on a par bond assumption, while few bonds pay coupons at current market rates.* Thus, the bonds are reflected in curve-building at maturity points that align each bond's actual duration with that of a par bond.

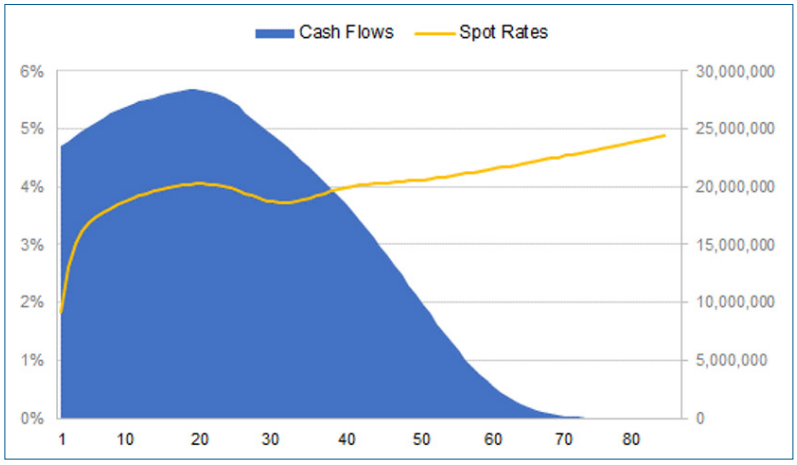


Bond data from Bloomberg

Once yields have been determined at each maturity point, spot rates can be derived (based on a methodology termed "bootstrapping"). These spot rates are then applied to a given set of projected benefit cash flows, and a present value determined. Often, a flat/single equivalent discount rate consistent with that present value is calculated and used to represent the valuation result.

* This becomes an especially critical issue when market rates are far below typical historic levels, as they have been in recent periods. Longer-maturity bonds in our portfolio have an average coupon of about 4.5%. To the extent this average coupon exceeds current market yields, the calculated duration for these bonds will be below that for a par bond at the same maturity. Representing the typical long bond at a shorter maturity point where its actual duration is consistent with that of a par bond maintains the integrity of the yield curve (based on its par bond convention). For 10+ year bonds in the March portfolio, coupon rates exceed fitted curve yields by an average 0.7%, which leads to a relatively small average gap between nominal and adjusted maturities of 0.4 years.

The example below reflects a very long duration cash flow (e.g., that for a deferred income annuity), along with the application of The Terry Group's moderate or baseline yield curve:



Single Equiv Discount Rate	3.90%
Present Value (millions)	$568.6
Duration	17.9

Variations in Discount Rate Outcomes

Discount rate outcomes almost always vary based on the duration of a given set of benefit cash flows—since the yield curve is almost never totally flat. Another element of variation in outcomes results from the approach taken to extrapolate the curve beyond the maturity point at which the most credible data ends—generally considered to be at about 30 years. The extrapolation impact will of course vary based on the duration of a given cash flow, i.e., for durations of 15 or less there may be little impact.

The Terry Group's March portfolio includes roughly 100 bonds with maturities beyond 30 years, about 20 of which have maturities beyond 40 years. This information, though limited, enables a range of possible extrapolation approaches:

Mar 31, 2022	*Extrapolated Slope*		
Duration	Flat	Moderate	Upward
Short	3.74	3.74	3.74
Long	3.89	3.90	3.90
Very Long	3.83	3.90	3.92

Note: the three sets of cash flows have approximate durations 8, 15.5, and 18.

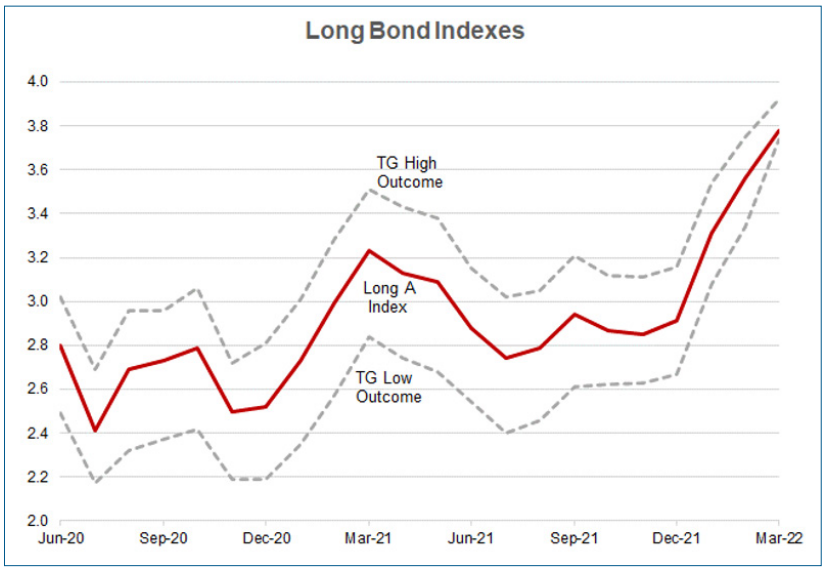
Increases in March discount rate results vary significantly by duration, due to the flattened slope and "humped" nature of the March yield curve (the curve peaks at about the 20-year point). Discount rate outcomes at shorter durations moved up 40 basis points, compared to increases of less than 20 basis points at longer durations.

The summarized discount rate outcomes indicate that the variation in results based on duration is significantly dampened — there is a range of 10–20 basis points across our three sample cash flows for March, less than half of the typical dispersion.

The variation in results based on the choice of extrapolation approach is also somewhat dampened given the flatter yield pattern, ranging from 0 to 9 basis points depending on duration. (Obviously, a cash flow stream with a significant long tail will be more affected by the approach used to extrapolate long bond yields.)

You should expect both sources of volatility—related to duration and curve-fitting impacts—to change significantly over time with evolving capital market conditions.

The following graph shows the range of model results over the period since The Terry Group's yield curve model was initiated in June 2020. Over time, the variations in discount rate outcomes for our sample cash flows, encompassing both duration and model/slope variations, have generally resulted in range of about 50–60 basis points, roughly centered around the index average yield. As the graph below illustrates, this pattern was significantly disrupted by the flatter slope and humped pattern of the March curve.



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