TERRY

Bond Market Update – May 2022
June 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:

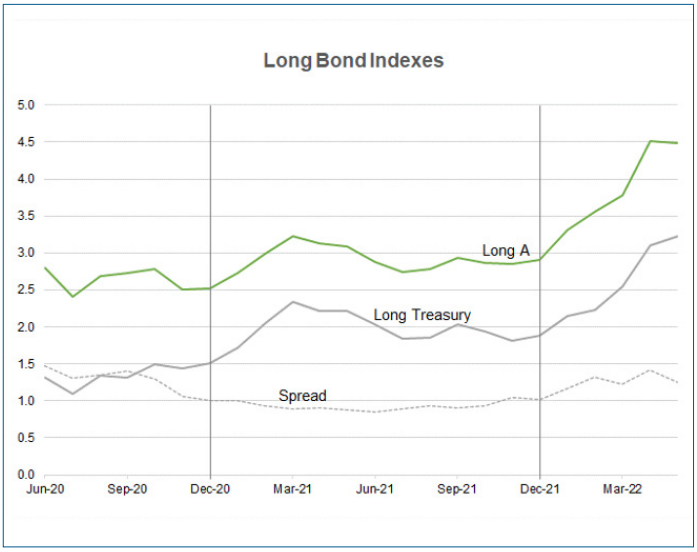
- range of credit ratings by different rating agencies
- minimum issue size to ensure credible bond trading/pricing
- inclusion/exclusion/adjustments for bonds with call features and other embedded options
- inclusion/exclusion of private placement, quasi-government and less broadly-traded bonds
- relative 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
5/31/2022	4.48	3.23	1.25
4/30/2022	4.52	3.10	1.42
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 stabilized in May, following a dramatic upward surge through the first four months of the year. The index yield is up 1.6% since year-end 2021, and 2.0% since year-end 2020. The long Treasury yield moved up slightly during the month, resulting in a small dip in credit spread.

As has been widely reported, recent long bond yields are strongly affected by a shift in monetary policy aimed at dampening increases in inflation expectations. Corporate rates are also impacted by cyclical vagaries in the level of economic activity and the resulting demand for capital funds.

The future trend for interest rates depends on how effective the current monetary policy restraint will be in suppressing the level of economic activity and thus constraining the inflation rate. A meaningful decline in economic activity (i.e., a recession) or in inflation measures might be expected to break the current pattern of rate increases. Looking beyond these near-term macro-economic issues, analysts generally do not expect a return to higher historic rate levels, in light of the country's maturing demographics and economy and the government's tendency toward expansionary monetary policy.

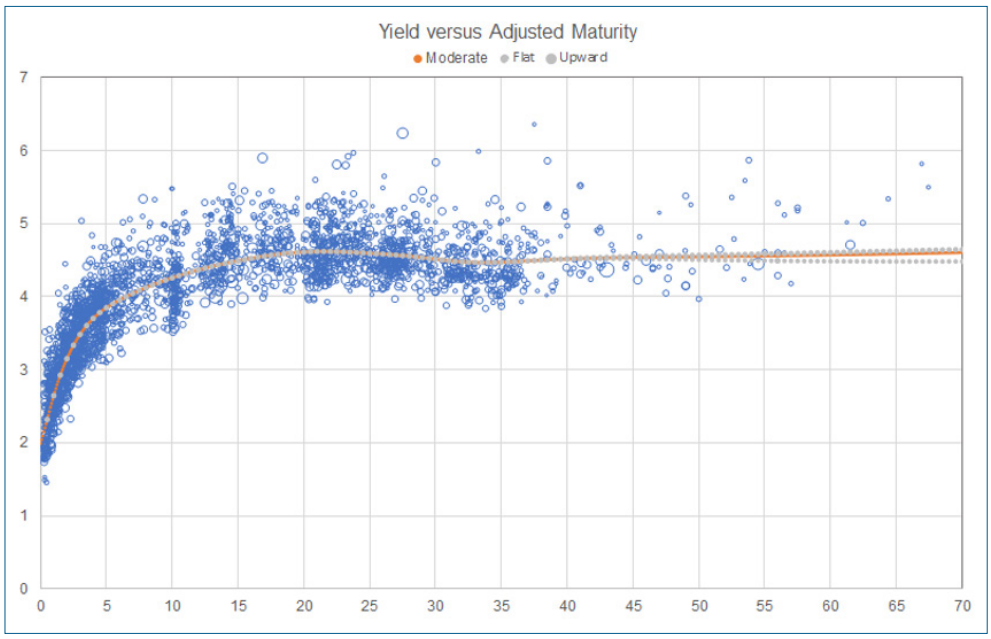
Building and Applying a Yield Curve

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

After filtering the A-grade bond universe for grading, optionality and other factors, the portfolio consists of over 3,000 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.

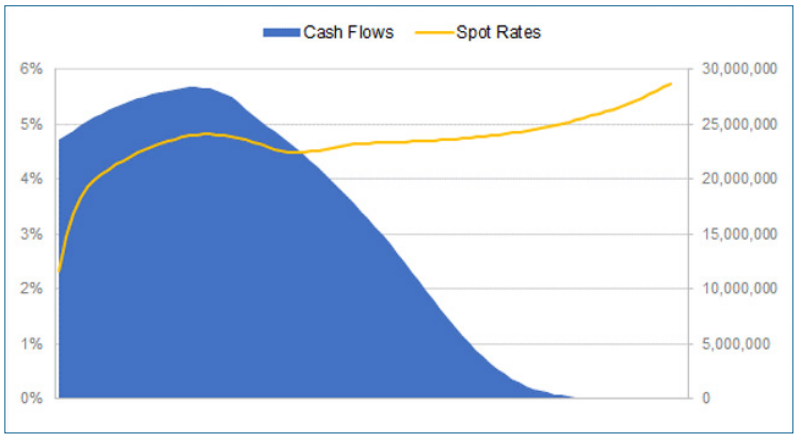


Bond data from Bloomberg

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.

* Longer-maturity bonds in our portfolio have an average coupon of about 4.5%. Since the curve utilizes a par bond convention, representing a given long bond at the maturity point where its actual duration is consistent with that of a par bond (with coupons presumed paid based on the market yield) maintains the integrity of the yield curve. This adjustment becomes an especially critical issue when market rates vary significantly from historic levels.

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	4.58%
Present Value (millions)	$510.4
Duration	16.6

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 is generally little impact.

The Terry Group's May portfolio includes over 300 bonds with adjusted maturities beyond 30 years, almost 70 of which have adjusted maturities beyond 40 years. This information enables a range of fairly robust extrapolation approaches:

May 31, 2022	*Extrapolated Slope*		
Duration	Flat	Moderate	Upward
Short	4.35	4.35	4.35
Long	4.60	4.60	4.60
Very Long	4.56	4.58	4.58

Note: the three sets of cash flows have approximate durations 7.5, 15, and 16.5.

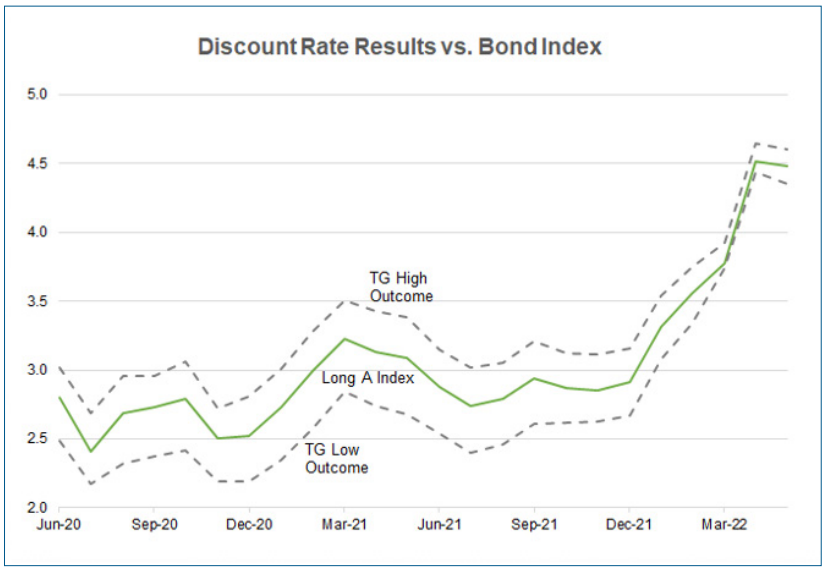
May discount rate outcomes moved down slightly, in aggregate roughly similar to the bond index results. But recent months' discount rate results indicate a rather unusual pattern due to the "humped" nature of the curves (with yields peaking in the 15–20 year maturity range) and the flattened slope at the longest maturities.

The summarized discount rate outcomes indicate that the variation in results based on duration is thus significantly dampened—there is a range of just over 20 basis points across our three sample cash flows for May, only about half of the typical dispersion across durations.

The variation in results based on the choice of extrapolation approach is almost completely eliminated given the flatter yield pattern, indicating a maximum difference of only 2 basis points across the duration range. (In comparison, results from the December 2021 model showed variations up to 15 basis points.)

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 variations in both cash flow duration and model/slope, have generally resulted in a range of about 50–60 basis points, roughly centered around the index average yield. As the graph illustrates, this pattern was significantly disrupted by the flatter slope and humped pattern of the recent months' curves.



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