FASB Accounting Standards Codification

ASC 715 Discount Rates

(formerly FAS 158)

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ASC 715 (formerly FAS 158) Discount Rates

When FAS 158 became effective December 15, 2006, Ryan ALM was hired by one of the Big Three accounting firms to provide discount rates in conformity to FAS 158. We continue to provide this accounting firm plus several actuarial firms and corporations such discount rates today as monthly data. We believe our discount rates consistently provide high discount rates that are in conformity with ASC 715, well documented and validated by auditors. This brochure explains our methodology.

ASC 715 Discount Rates Rules

ASC 715-30-35-44
Same as: FAS 158 paragraph 44A; FAS 87 (Amended) and FAS 106, paragraph 186

"Pursuant to paragraph 44, an employer may look to rates of return on high-quality fixed income investments in determining assumed discount rates. The objective of selecting assumed discount rates using that method is to measure the single amount that, if invested at the measurement date in a portfolio of high-quality debt instruments, would provide the necessary future cash flows to pay the pension benefits when due. Notionally, that single amount, the projected benefit obligation would equal the **current market value of a portfolio of high-quality zero coupon bonds whose maturity dates and amounts would be the same as the timing and amount of the expected future benefit payments.** Because cash inflows would equal cash outflows in timing and amount, there would be no reinvestment risk in the yields to maturity of the portfolio. However, in other than a zero coupon portfolio, such as a portfolio of long-term debt instruments that pay semiannual interest payments or whose maturities do not extend far enough into the future to meet expected benefit payments, the assumed discount rates (the yield to maturity) need to incorporate expected reinvestment rates available in the future. Those rates shall be extrapolated from the existing yield curve at the measurement date. The determination of the **assumed discount rate is separate from the determination of the expected rate of return on plan assets** whenever the actual portfolio differs from the hypothetical portfolio above. Assumed discount rates shall be reevaluated at each measurement date. If the general level of interest rates rises or declines, the assumed discount rates shall change in a similar manner."

ASC 715 Methodology

Ryan ALM provides *three distinct discount rate yield curves* that best conform to GAAP requirements. Each curve is comprised of hypothetical AA corporate zero-coupon bonds from 0.5 -30+ years to maturity:

Top 1/3 Curve	**(top 33% yielding bonds)**
Above Median Curve	**(top 50% yielding bonds)**
Full Curve	**(all 100% yielding bonds)**

Yield curve derived from actual AA and AAA corporate bonds placed into eight maturity bands:

1.01 - 3.00 years
3.01 – 5.00 years
5.01 – 7.50 years
7.51 – 9.50 years
9.51 – 17.00 years
17.01 – 24.00 years
24.01 – 27.00 years
27.01 + years

ASC 715 Methodology

Parameters of Eight (8) Maturity Bands:

Ratings	**AA+**
Minimum Issue Size	**$100 million**
Currency	**U.S. Dollar Denominated**
Coupon	**Non zero, fixed coupon bonds**
Maturity Type	**Option Free (No putable or callable bonds)**
Issue Type	**Publicly traded U.S. Corporate bonds**
	Private placements with 6 months seasoning
	No Foreign Agencies, Govt., Supranationals
Pricing	**Excludes bonds priced outside $55 - $145 range**
Yields	**Excludes YTM > 2.0 standard deviations from average YTM**

Par Curve:

Market weighted average yield to maturity (YTM) + term is calculated for each maturity band
Semi-annual yield curve (60 points) created by applying *5th order polynomial curve fit* technique.
Produces *best fit* yield curve providing a smooth and continuous yield curve between 8 points.

Spot Rate Yield Curve:

Spot rate curve is developed by using a Bootstrapping technique.
The spot rate curve is then converted to annualized yields.

ASC 715 Methodology

Par Curve:

Given the yield curve parameters, a universe of bonds is selected. Using vendor bid/ask mid-point prices and a proprietary system developed by Ryan ALM, total market value (price + accrued interest), YTM and TERM values are calculated for each qualifying bond and placed into eight (8) maturity bands. For each of the maturity bands, the market weighted average TERM and yield to maturity (YTM) is calculated. A semi-annual yield curve (60 points from 0.5 to 30.0 years) is created by applying a ***5th order polynomial least squares curve fit*** technique. The least squares option of the 5th order curve fit is where the summation of the squares of the residuals of all the data points has the smallest value or deviation. As a result, this technique produces a ***best fit*** yield curve providing a smooth and continuous yield curve between 8 points (maturity bands).

Spot Rate Yield Curve:

A zero-coupon spot rate yield curve is developed by using a ***Bootstrapping*** technique from the par curve. Bootstrapping is a process of building up discount rates which equate the cash flows of a yield curve of semi-annual coupon bonds to a hypothetical yield curve of zero-coupon bonds derived from the Par Curve. This hypothetical zero-coupon yield curve is referred to as the "Spot Rate Curve". The spot rate curve is then converted to annualized yields or APR (Annual Percentage Rate).

High End Select - Discount Rate Yield Curve

Designed for smaller plans, Ryan ALM provides a 4th discount rate option… High End Select. This has the same methodology as the other three discount rate curves with the following exception:

Ten maturity bands with number of bonds limited to:
1st and 10th maturity band = 2x the number of years in the band
2nd thru 9th maturity band = 1x the number of years in the band

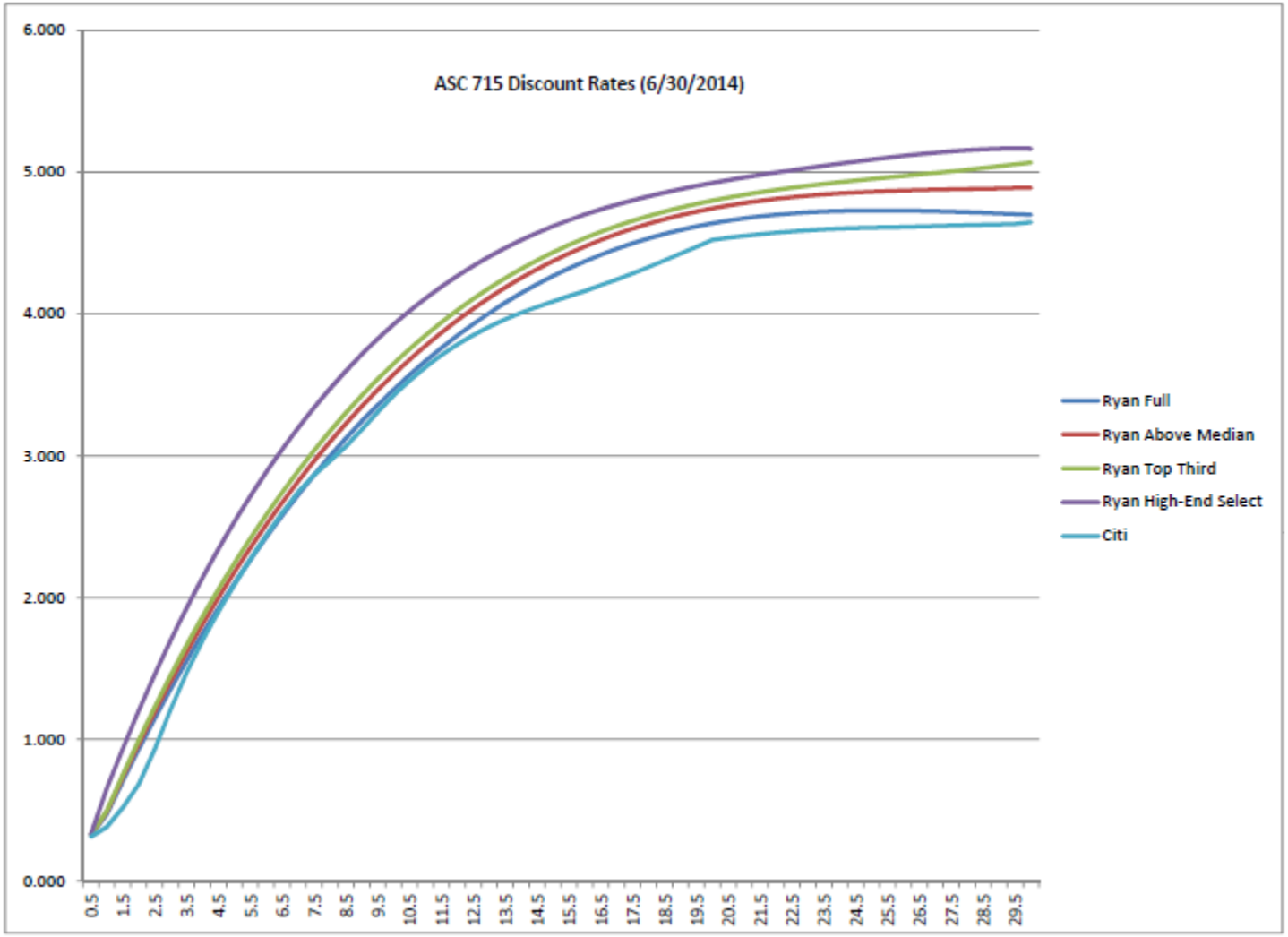
Maturity Band (years)	1.01-2.00	2.01-4.00	4.01-6.00	6.01-9.00	9.01-12.00	12.01-15.00	15.01-18.00	18.01-22.00	22.01-26.00	26.01-30.00
# of Bond Issues Selected	2	2	2	3	3	3	3	4	4	8

Ryan ALM ASC 715 Discount Rates Comparisons

The Ryan ALM ASC 715 discount rates consistently demonstrate a higher yield than the Citigroup discount rates. As the following three graphs show, the yield difference is as follows:

Top 1/3	**=**	**21 to 84 basis points**
Above Median	**=**	**11 to 62 basis points**
Full Curve	**=**	**-1 to 27 basis points**

Based on the *Above Median* discount rates, for every $1 billion in projected liability benefit payments the reduction in present value would be $11 to $62 million versus Citigroup discount rates.


ASC 715 Discount Rates (6/30/2014)
6.000
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3.000
2.000
1.000
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0.5
1.5
2.5
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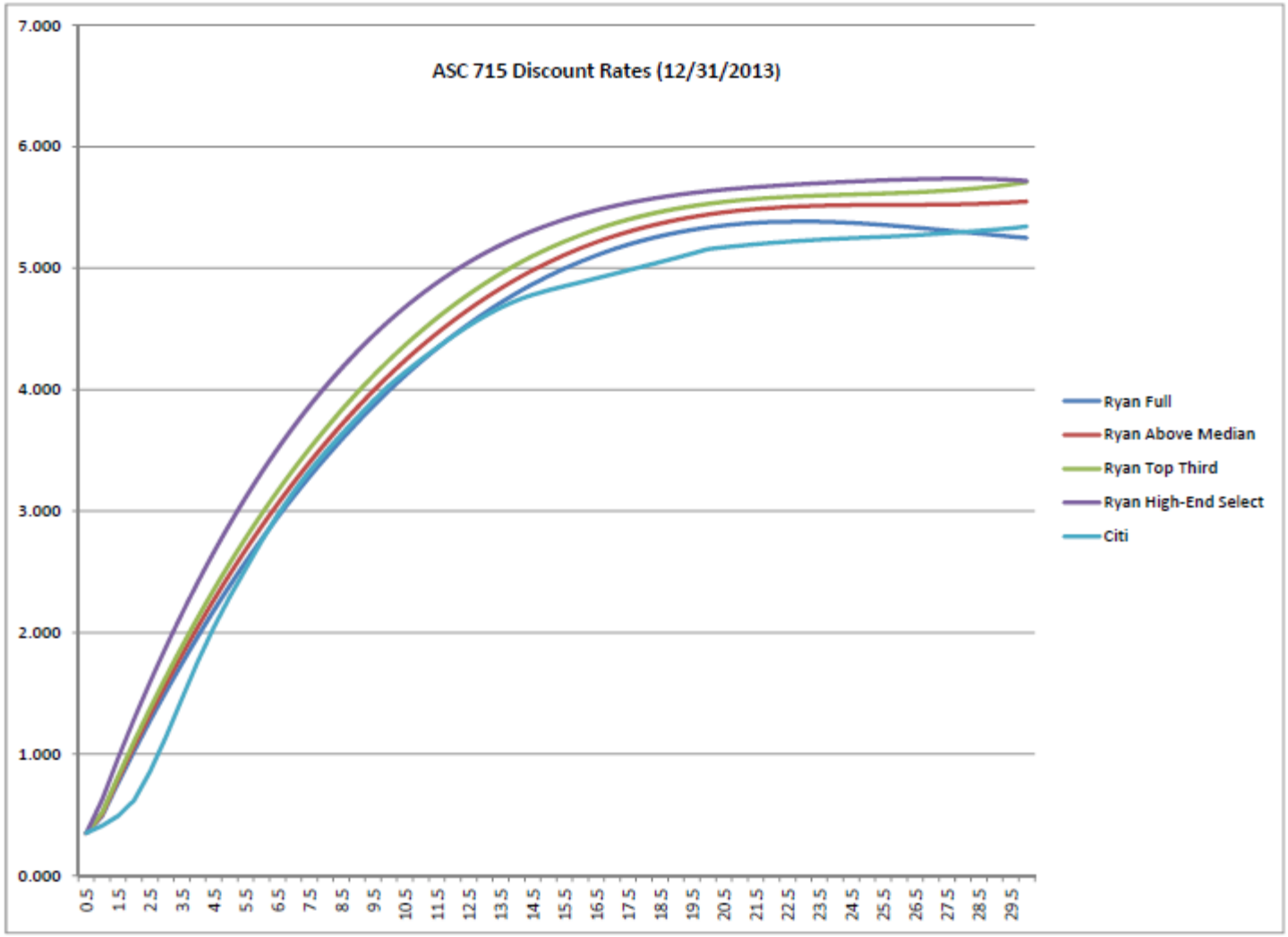
27.5
28.5
29.5
Ryan Full
Ryan Above Median
Ryan Top Third
Ryan High-End Select
Citi


ASC 715 Discount Rates (12/31/2013)
7.000
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29.5
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Ryan Above Median
Ryan Top Third
Ryan High-End Select
Citi

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