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MERCER YIELD CURVE REFINEMENTS

The Mercer Yield Curve (MYC) is created for Mercer clients who are setting assumptions for accounting valuations. The data and methodology used to create the MYC are reviewed periodically to ensure that the best use is made of available resources. The last review leading to changes was completed in 2016.

We have recently reviewed both the UK MYC and the Eurozone MYC. This review concluded that the UK MYC did not require alteration. However, it found that there were two areas in the Eurozone MYC where improvements could be made:

- The method used by the Eurozone MYC to incorporate information from A-rated bonds may not remain reliable in the current financial climate and the best way to resolve the issue was to remove A-rated bond information from the curve.

- The method used by the Eurozone MYC to derive a treasury curve by extending the treasury curve provided by the European Central Bank (ECB) for AAA-rated bonds had a number of technical issues (as described below). We initially proposed that the best way to resolve these issues was to calculate an alternative treasury curve using AA- and AAA-rated government bond information; however, following auditor feedback, have modified our approach to use only AA-rated government bonds.

This paper is addressed to auditors, and provides details about the refinements to the Eurozone MYC adopted from 31 August 2018. In addition to this paper, we will provide details of the curve without refinements at key future accounting dates such as quarter ends, and provide additional information to the technical teams of audit firms as required.

The general feedback from auditors when the refinements were proposed was that the updated Eurozone MYC complies with the requirements of IAS 19 and US GAAP, but additional disclosures may be required if the improvements result in emerging differences which are greater than the scheme's materiality limits, so the impact should be discussed with the auditor. If your view differs, we would welcome details about why this is the case.

Finally this paper provides details of some non-material adjustments which have been made since 2016.

Sebastian Bleasdale
September 2018

USE OF DERIVED BONDS IN THE EUROZONE MYC

In the Eurozone a deep market of AA-rated bonds exists up to durations of roughly 15 years. After this, the number of bonds reduces significantly. In 2012, discussions in the IFRS interpretations committee around this problem appeared to lend support to the approach of supplementing bond information after 15 years with information from derived bonds, i.e. bonds of lower quality whose yields were adjusted before inclusion.

The methodology for the Mercer Yield Curve picked up this approach, incorporating A-rated bonds with maturities greater than 15 years with yields adjusted based on an estimated AA to A spread. The spread is determined by creating an A-rated curve using the same methodology as is used for the AA curve, which is compared against the yields on bonds in the AA curve with terms greater than 7 years. The methodology is therefore based on the assumption that there is little term structure to the spread for terms greater than 7 years, which was reasonable at the time the methodology was designed.

Our recent review suggests that in mid-2018 there is some evidence that market conditions are resulting in a spread that increases with term. While we believe that the Eurozone MYC is still giving reasonable results, we have decided to remove derived bonds from the Eurozone MYC to make it clear that this issue is not affecting the curve, and to avoid problems in the future if this issue becomes more pronounced.

We believe that use of derived bonds is reasonable in principle, and may review our approach again.

DETERMINING A TREASURY CURVE

When determining the Eurozone MYC, spot rates derived from the corporate bond regression curves are used until the term equal to the average maturity term for the last five available AA-rated corporate yields included in the curve (with a maximum of 30 years). Between this point and 50 years, spot rates are calculated by holding the spread of the corporate bond curve over the treasury curve constant.

The treasury curve is currently calculated by using the AAA-rated government bond curve calculated by the ECB, extended using data from Austrian strips. However, this approach has several issues:

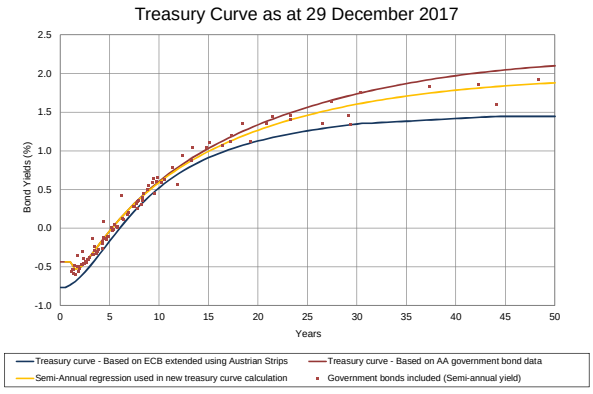
- The method which the ECB use for fitting the AAA-rated government bond curve results in instantaneous forward rates that are flat from terms of about 15 years. This means that the use of the ECB curve data for periods beyond the point of about 15 years is open to question.

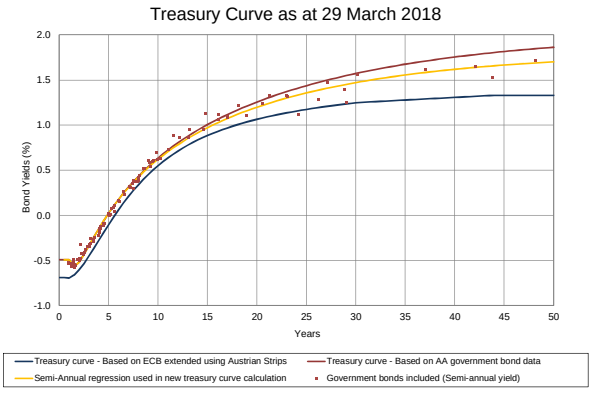
- It does not make best use of the market data – the period up to 30 years does not make use of any AA-rated government bond data, while the period from 30 years onwards uses government bond data issued by a single country.

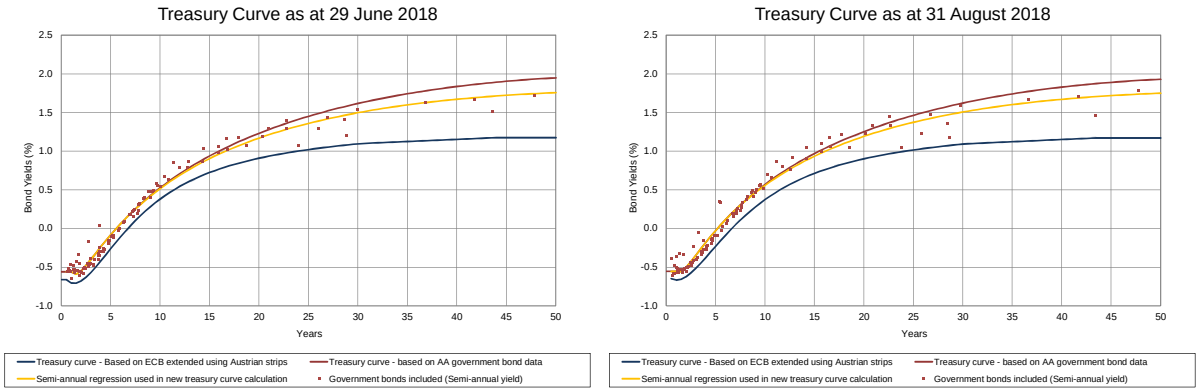
- The methods used before and after 30 years are inconsistent resulting in a discontinuity at that point.

We considered different ways of calculating the treasury curve. One way which we investigated was to apply the MYC curve fitting methodology to the universe of AAA- and AA-rated Euro-denominated government bonds. However auditors were concerned that the curve would be distorted by different proportions of AA and AAA rated bonds at different points of the curve.

We therefore decided to calculate the treasury curve by applying the MYC curve fitting methodology to the universe of AA-rated Euro-denominated government bonds. At the current time, this amounts to bonds issued by Austria, Belgium, Finland, France, and Korea. Charts below show the treasury curve calculated using the current methodology and the proposed methodology as at as at the last three quarter ends and at 31 August 2018.







As with the Mercer Yield Curve, we use least squares regression to fit a curve through the government bond data (shown in yellow), and then use this to construct a yield curve (shown in red) using a process called bootstrapping. Bootstrapping allows for the fact that the market yield on a bond is not governed solely by the expected yield for the final payment, but also the yield on each of the coupon payments. When the curve is upward sloping (as it has been in the recent past), adjusting the market yield to remove the impact of coupon payments will result in the yield being increased.

As you can see, the updated approach fits the available market data well.

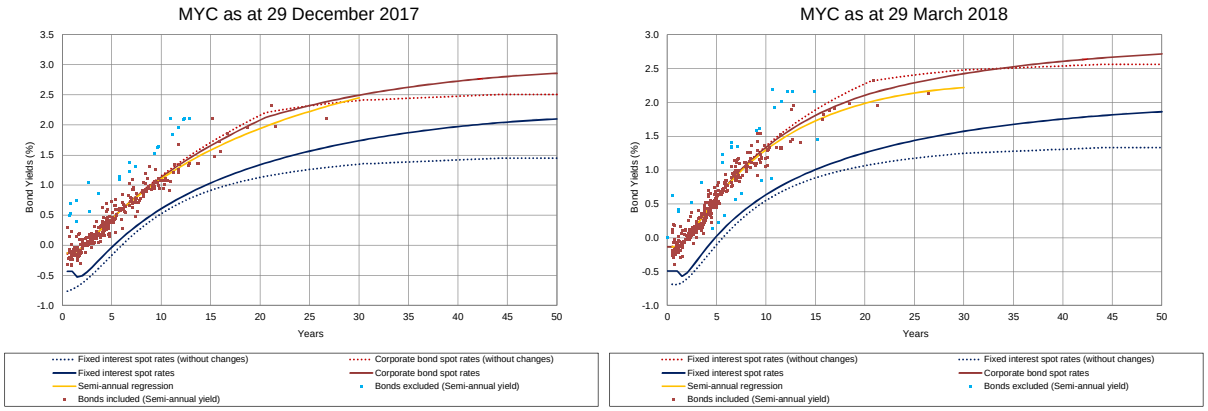
IMPACT OF REFINEMENTS

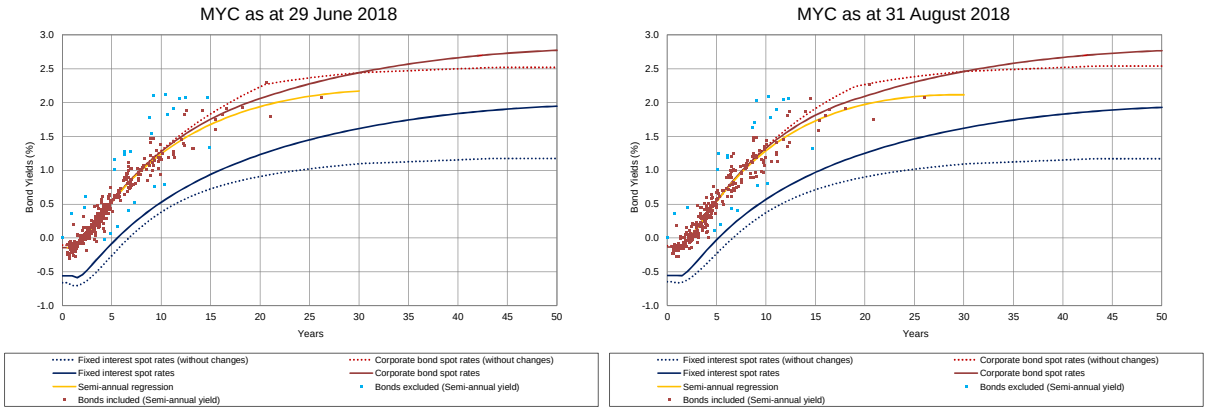
The charts below show the impact on the Eurozone Mercer Yield Curve of these two refinements at 29 December 2017, 29 March 2018, 29 June 2018 and 31 August 2018, as well as the impact on single equivalent rates for sample schemes of various durations at those dates.

The impact is that the resulting curve is considerably smoother around the transition point, with the AA-rated corporate bond curve regression and the extrapolation in line with the treasury curve aligning better with one another. This reinforces our view that the update to the treasury curve makes it a better fit for purposes of extrapolation than the previous approach following the AAA curve published by the ECB.

The impact on single equivalent rates for the dates at which we performed analysis ranges from modest decreases, typically at shorter durations, to modest increases, typically at longer durations depending on whether the impact of the decrease due to the removal of derived bonds or the increase due to the change in the treasury curve dominates.

This moderate impact supports our view that the Eurozone MYC is producing reasonable results prior to our proposed refinements.





The impact of the proposed refinements on the single equivalent rates for various typical pension scheme profiles is shown below. A full summary of the single equivalent rates before and after the refinements and their associated durations at each date is provided in the appendix.

Scheme Profile	29 Dec 2017	29 Mar 2018	29 Jun 2018	31 Aug 2018
Very Short	0.00%	0.00%	0.00%	0.00%
Short	-0.02%	-0.03%	-0.02%	-0.02%
Retiree	0.00%	-0.06%	-0.04%	-0.05%
Shorter Intermediate	0.05%	-0.04%	-0.01%	-0.02%
Intermediate	0.10%	-0.02%	0.02%	0.01%
Longer Intermediate	0.13%	-0.01%	0.05%	0.04%
Long	0.17%	0.02%	0.09%	0.07%

In our view, the amendments we are suggesting are a refinement to an accounting estimate rather than a change in accounting policy. With regards to the removal of derived bonds, the loss of bond data following market changes could be viewed as akin to losing bond data due to bond downgrades, so we do not view their removal as a change in methodology. Similarly, the change in treasury rate could be viewed as being akin to increasing the data which is being taken account of in the curve extrapolation process.

Furthermore, both these refinements impact the curve extrapolation, and because of the absence of longer dated AA-rated corporate bond data, any approach to extrapolating the curve requires a level of judgement to be applied.

Finally, the impact of making these refinements was modest at the dates which we investigated. We therefore do not expect making these refinements will require any material additional disclosures.

MINOR ADJUSTMENTS MADE SINCE 2016

In the period since 2016, we have made some minor adjustments to the yield curve calculation process for both the UK MYC and the Eurozone MYC.

- The data underlying the UK and Eurozone MYCs were previously supplied by both Bloomberg and Thomson Reuters. In order to improve operational efficiency, we switched to using only Thomson Reuters data.

- Historically, our process determined which bonds should be in the MYC based on ratings information from the preceding month end. Our processes have been updated to take account of daily changes in ratings information.

- We have reviewed our bond categorisations (e.g. determining whether bonds are issued by entities with significant government backing) and, as a result, have changed how a handful of bonds were classified.

APPENDIX

Provided below is a summary of the single equivalent rates both before and after the proposed refinements as at 29 December 2017, 29 March 2018, 29 June 2018 and 31 August 2018.

29 December 2017

Scheme Profile	Very short	Short	Retiree	Shorter intermediate	Inter-mediate	Longer intermediate	Long
Duration (years)	2.5	5.1	13.0	17.2	23.6	27.3	32.2
Before	0.23%	0.86%	1.82%	2.02%	2.23%	2.31%	2.38%
After	0.23%	0.84%	1.82%	2.07%	2.33%	2.44%	2.55%
Difference	0.00%	-0.02%	0.00%	0.05%	0.10%	0.13%	0.17%

29 March 2018

Scheme Profile	Very short	Short	Retiree	Shorter intermediate	Inter-mediate	Longer intermediate	Long
Duration (years)	2.5	5.1	12.9	17.0	23.5	27.2	32.0
Before	0.33%	1.01%	1.94%	2.13%	2.32%	2.39%	2.45%
After	0.33%	0.98%	1.88%	2.09%	2.30%	2.38%	2.47%
Difference	0.00%	-0.03%	-0.06%	-0.04%	-0.02%	-0.01%	0.02%

29 June 2018

Scheme Profile	Very short	Short	Retiree	Shorter intermediate	Inter-mediate	Longer intermediate	Long
Duration (years)	2.5	5.1	12.9	17.1	23.5	27.2	32.1
Before	0.29%	0.95%	1.89%	2.09%	2.28%	2.35%	2.41%
After	0.29%	0.93%	1.85%	2.08%	2.30%	2.40%	2.50%
Difference	0.00%	-0.02%	-0.04%	-0.01%	0.02%	0.05%	0.09%

31 August 2018

Scheme Profile	Very short	Short	Retiree	Shorter intermediate	Inter-mediate	Longer intermediate	Long
Duration (years)	2.5	5.1	12.9	17.0	23.5	27.2	32.1
Before	0.29%	0.98%	1.93%	2.12%	2.31%	2.37%	2.44%
After	0.29%	0.96%	1.88%	2.10%	2.32%	2.41%	2.51%
Difference	0.00%	-0.02%	-0.05%	-0.02%	0.01%	0.04%	0.07%