

Bootstrapping Swap Rates under the Single and Multi-Curve Frameworks

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- To value contracts and compare prices in a single and multi-curve framework.
- We valued 3 annual swaps, with maturities 10, 20 and 30 years.

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- Since the Financial crisis of 2007, the original single curve pricing framework has been abandoned.
- This has brought about a new era of in modern pricing called the multi-curve framework, where two curves are used.
- One curve is used to generate the cash flows and the other is for discounting those cash flows.
- In this framework the forward rates are used to generate the cash flows and the zero-coupon rates are used to discount these cash flows.

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- We have Bootstrapped data on the European interest rate market to obtain swap rate curves with maturity times of 10, 20 and 30 years.
- This was done using the Nelson-Siegel-Svensson model.
- We calculated the OIS 6M, 3M and 6M EURIBOR discount factors. Then we calculated the corresponding forward rates.
- To achieve smoother curves we used the NSS model and solved the parameters using Excel solver function.

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- When calculating the value of our contracts under the multi-curve framework, we have considered collateral agreements. We used the OIS curve when discounting where such an agreement exists and the 6M discounting curve otherwise.
- We have also looked at the case of the single curve framework. In this case we generated the cash flows using the 3M curve and discounted by the same curve.

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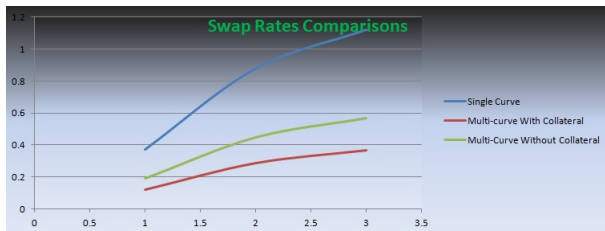
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- Using the single curve framework shows the highest rate. We believe this is due to the biggest exposure to risk.
- The multi-curve framework without a collateral agreement also gives a higher price than with such an agreement. Again, this seems to take into consideration the extra credit risk involved.
- We believe our results show the advantage of entering into a collateral agreement.



THANK YOU! ANY QUESTIONS?



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