Introduction to General Swaption Valution with SabrSwaption

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Abstract An abstract of less than 150 words.

Introduction

RQuantlib is a package that exposes some of the functionality of Quantlib to users via a simple R interface. There is a broad set of functions that include fixed income and interest vrate derivatives. This article goes in depth regarding a new function made available that exposes Peter Casper's SABR modeling and the more recent work on path dependent Bermudan swaptions via his Markov Functional model **?**.

Recent functions have been added to the RQuantlib package that expose more relevant interest rate option functionaility to current swaption market. One function, discussed in greater detail here, is SabrSwaption, which provides access to the European and Bermudan exercise swap options, or swaptions.

The underlying math that is required to line up no-arbitrage pricing of swaptions is varied in approach and the methodologies implemented in Quantlib are illustrated in **?** for European exercise while the methodology for the Bermudan is documented in Caspers. The complication anyone implementing these models is the exponential grwoth in data requirements. While a yield curve can be described eficiently with 10-20 data points in one dimension, the volatility data is a cube. Given the size of the data an example data set is provided with the package in order to help the user get started with the new function. The yield curve provided, tsQuotes, is a small dataset, while the volatility data in the vcube dataset is 1384 observations for a single currency. Handling the scale of this complexity requires appropriate tools, and a Shiny app is included to help the user get started with inquiring and managing the scale of the data.

Interest Option Modeling

An example is included in the

This section may contain a figure such as Figure 1.

Figure 1: The logo of R.

Another section

There will likely be several sections, perhaps including code snippets, such as:

```
x <- 1:10
x
```

```
#> [1]  1  2  3  4  5  6  7  8  9 10
```

Summary

This file is only a basic article template. For full details of *The R Journal* style and information on how to prepare your article for submission, see the Instructions for Authors.

Bibliography

P. Caspers. Markov functional one factor interest rate model implementation in quantlib. Mimeo, Available at SSRN: http://ssrn.com/abstract=2183721, 2013. [p]

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