Master Thesis

February 16, 2024

Contents

Title

Swaptions pricing

Thesis statement

In this thesis, I will investigate asset allocation with respect to swaptions and the affect different swaptions strategies has. This analysis receivers a model selection to price swaptions and the different strategies will be back tasted on data.

Structure

1 Asset allocation

- Write about different assets.
- drawdown plot on some equites, bonds and implied volatility
- inflation plot on the same equites, bonds and implied volatility

The idea is to give a motivation for swaptions as derivative in asset allocation.

2 Swaptions

Introduction to swaptions

3 Pricing swaptions

Setup the framework for what is need to price swaptions

4 risk neutral pricing

Introduce risk neutral pricing, so in the end it is possible to price swaptions

5 Black model

Introduce the black model. Comment on there is a sigma - volatility, and what should this sigma be. Transition to introducing the SABR model.

6 SABR model - implied volatility

The SABR model can be used to find implied volatility. Which we can insert in the Black model, so we can price the swaption. I have data on implied vol from Citi velocity.

7 Risk premium

Introduce how risk premium are calculated, we can perform teo different swaptions strategies

Risk premium = expected return - risk-free rate

8 Two strategies

10Y 10Y ATM EUR swaption - 20 years data and 3M 3M ATM EUR swaption - 20 years data Maybe also for USD swaptions The goals is to find that swaption make good sense when you have a strategy when the swaptions has a long duration.

9 Data

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- 10Y 10Y EUR normal vol
- 20Y 10Y EUR normal vol
- 3M 3M EUR normal vol
- 1Y 1Y EUR normal vol
- 10Y 10Y USD normal vol
- 20Y 10Y USD normal vol
- 3M 3M USD normal vol
- 1Y 1Y USD normal vol