Interest Rate Futures and Valuation

FinPricing

Summary

- Interest Rate Future Definition
- Advantages of trading interest rate futures
- Valuation
- A real world example

Interest Rate Future Definition

- An interest rate future is a contract between the buyer and seller to deliver an interest rate asset at a specified rate on a specified date.
- The future allows the buyer and seller to lock in the price of the interest rate asset at a future date.
- Interest rate futures are usually traded in an exchange.
- It is used to hedge against adverse changes in interest rates.
- Interest rate futures are mainly listed for 3-month Eurodollar, 1-month LIBOR, 1-month banker’s acceptance futures and 3-month banker’s acceptance futures.

Interest Rate Future

Advantages of trading interest rate futures

- Interest rate futures are used to hedge against interest rate risk.
- Investors can use interest rate futures to secure an interest rate for money it plans to borrow or lend in the future.
- Futures markets tend to be more liquid than underlying cash markets.
- Other benefits
  - Price transparency and liquidity
  - Immediate execution and confirmation
  - Reduction of counterparty risk
  - Centralized clearing.

Interest Rate Future

Valuation

- The price of an interest rate future is quoted by the exchange.
- A model is mainly used for calculating sensitivities and managing market risk.
- The present value of an interest rate future is given by

$$PV(t) = n\tau(F_t - F) + C$$

where

- t – the valuation date,
- n – the contract size,
- τ – day count fraction for period $[T, T_E]$; in particular, $\tau = 90/360$ for 30-month Eurodollar future.

Valuation (Cont)

- T – the maturity of the future contract and also the start date of forward period
- T_E – the end date of the forward period
- F – the quoted future contract price at the trading date.
- $F_t = 100 - Y(t; T, T_E) + C$ – the future contract price at valuation date t.
- $Y(t; T, T_E)$ – the annually compounded forward yield for the forward period $[T, T_E]$.
- C – a constant used to match the market price.

Interest Rate Future

A Real World Example

Interest rate future specification	
Buy Sell	Buy
Currency	USD
Contract Size	10000
First Delivery Date	5/30/2018
Last Delivery Date	6/29/2018
Future Maturity Date	6/18/2018
Tenor	3M
Future Ticker	EDM18
Future Ticker Size	100
Future Ticker Value	25
Number of Contract	100
Quote Price	98.405
Trade Date	12/2/2016

Thanks!

Reference:
https://finpricing.com/lib/EqVariance.html