Interest Rate Futures and Valuation
Interest Rate Future

Summary

- Interest Rate Future Definition
- Advantages of trading interest rate futures
- Valuation
- A real world example
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.
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,
- \( \tau \) – 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.
A Real World Example

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Thanks!

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