

# Valuation

- Straight bond vs. FRN
- What to pay, what to receive
- Notional principal
- Maturity and frequency
- Interest rate / Exchange rate

## Valuing Swap Contract

## Valuing Swap Contract #Question 7.2

- A \$100 million interest rate swap has a remaining life of 10 months.
- Under the terms of the swap, six-month LIBOR is exchanged for 4% per annum (compounded semiannually).
- Six-month LIBOR forward rates for all maturities are 3% (with semiannual compounding).
- The six-month LIBOR rate was 2.4% two months ago.
- OIS rates for all maturities are 2.7% with continuous compounding.
- What is the current value of the swap to the party paying floating?
- What is the value to the party paying fixed?

## Valuing Swap Contract #Question 7.4

- A currency swap has a remaining life of 15 months.
- It involves exchanging interest at 10% on £20 million for interest at 6% on \$30 million once a year.
- The term structure of risk-free interest rates in the United Kingdom is flat at 7%, and the term structure of risk-free interest rates in the United States is flat at 4% (both with annual compounding).
- The current exchange rate (dollars per pound sterling) is 1.5500.
- What is the value of the swap to the party paying sterling?
- What is the value of the swap to the party paying dollars?

## Valuing Swap Contract #Question 7.16

- Explain how you would value a swap which is the exchange of a floating rate in one currency for a fixed rate in another currency.

## Valuing Swap Contract #Question 7.18

- A financial institution has entered into a swap
- where it agreed to make quarterly payments at a rate of 3% per annum and
- receive the SOFR three-month reference rate on a notional principal of \$100 million.
- The swap now has a remaining life of 7.5 months.
- Assume the risk-free rates with continuous compounding (calculated from SOFR) for 1.5, 4.5, and 7.5 months are 2.8%, 3.0%, and 3.1%, respectively.
- Assume also that the continuously compounded risk-free rate observed for the last 1.5 months is 2.7%.
- Estimate the value of the swap.

## Valuing Swap Contract #Question 7.20

- The one-year LIBOR rate is 3%, and the LIBOR forward rate for the 1- to 2-year period is 3.2%.
- The three-year swap rate for a swap with annual payments is 3.2%.
- What is the LIBOR forward rate for the 2- to 3-year period if OIS zero rates for maturities of one, two, and three years are 2.5%, 2.7%, and 2.9%, respectively?
- What is the value of a three-year swap where 4% is received, and LIBOR is paid on a principal of \$100 million?
- All rates are annually compounded.

(skip) Question 7.21, 7.17, 7.23, 7.10, 7.9

## Discussion



## Discussion #Question 7.5

- Explain the difference between the credit risk and the market risk in a swap.

## Discussion #Question 7.7

- A bank enters into an interest rate swap with a nonfinancial counterparty using bilaterally clearing where it is paying a fixed rate of 3% and receiving floating.
- No collateral is posted, and no other transactions are outstanding between the bank and the counterparty.
- What credit risk is the bank subject to?
- Discuss whether the credit risk is greater when the yield curve is upward sloping or when it is downward sloping.

## Discussion #Question 7.14

- Why is the expected loss to a bank from a default on a swap with a counterparty less than the expected loss from the default on loan to the counterparty when the loan and swap have the same principal?
- Assume that there are no other derivatives transactions between the bank and the counterparty, that the swap is cleared bilaterally, and that no collateral is provided by the counterparty in the case of either the swap or the loan.

(skip) Question 7.13

## Miscellaneous

## Miscellaneous #Question 7.6

- A corporate treasurer tells you that he has just negotiated a five-year loan at a competitive fixed rate of interest of 5.2%.
- The treasurer explains that he achieved the 5.2% rate by borrowing at a six-month floating reference rate plus 150 basis points and swapping the floating reference rate for 3.7%.
- He goes on to say that this was possible because his company has a comparative advantage in the floating-rate market.
- What has the treasurer overlooked?

(skip) Question 7.12

## Review

- Introduction
- Futures Markets and Central Counterparty
- Hedging Strategies Using Futures
- Interest Rates
- Determination of Forward and Futures Prices
- Swaps