

AcF 304 Financial Markets



Financial Derivatives-Part 2

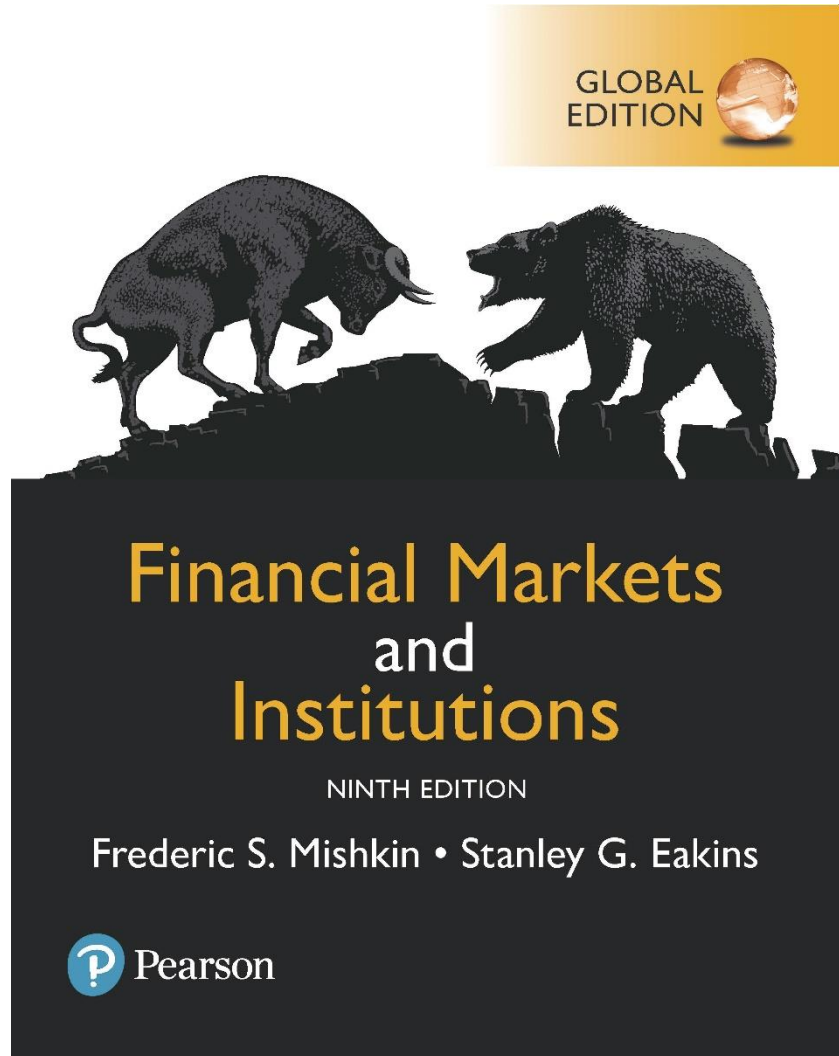
QUADRUPLE-ACCREDITED, WORLD-RANKED



Lancaster University
Management School

Financial Markets and Institutions

Ninth Edition, Global Edition



Reading – Chapter 24 Hedging with Financial Derivatives

*We follow the chapter quite
closely but do NOT include
coverage of Options*

Interest Rate Swaps

- **Interest Rate Swaps** involve the exchange of one set of interest payments for another set of interest payments, all denominated in the same currency.
- Simplest type, called a *plain vanilla swap*, specifies
 1. the rates being exchanged,
 2. type of payments
 3. **notional** amount.

QUADRUPLE-ACCREDITED, WORLD-RANKED



Interest-Rate Swap Contract Example

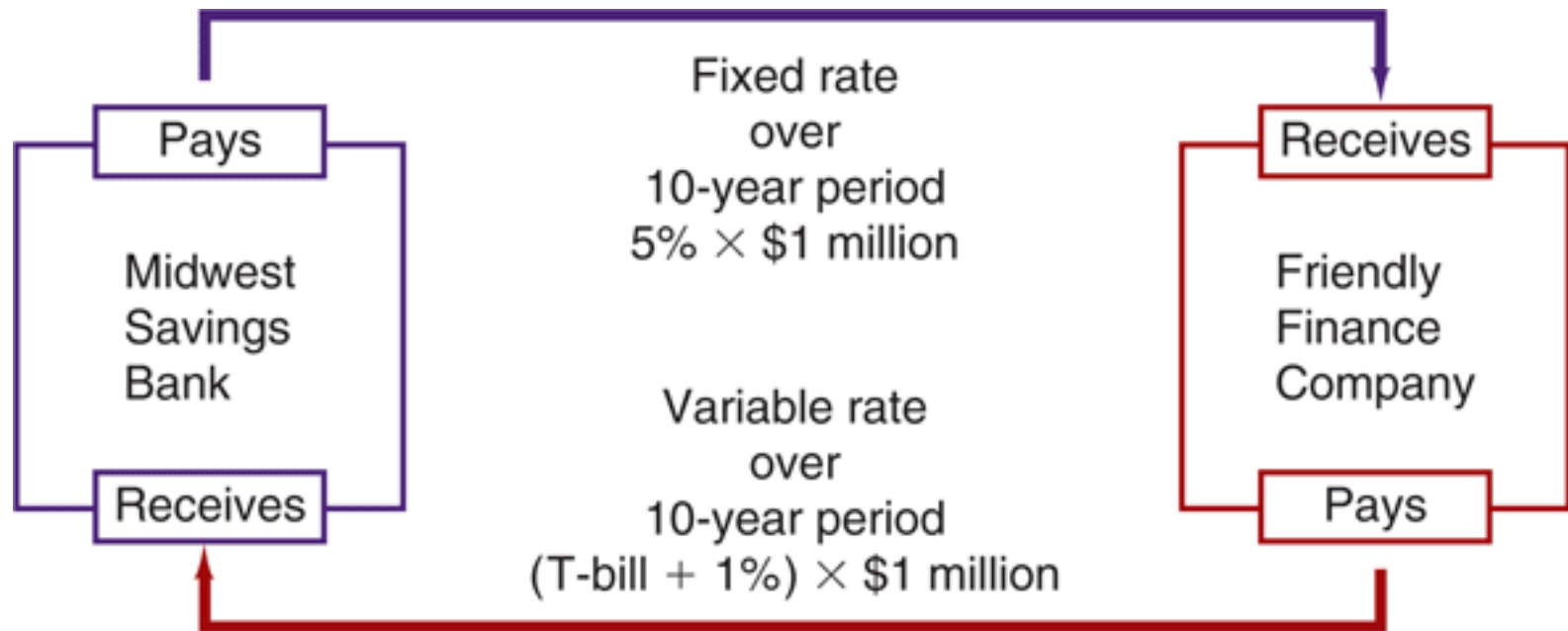
- Midwest Savings Bank wishes to hedge rate changes by entering into variable-rate contracts.
- Friendly Finance Company wishes to hedge some of its variable-rate debt with some fixed-rate debt.
- Notional principle of \$1 million
- Term of 10 years
- Midwest SB swaps 5% payment for 6 month T-bill + 1% from Friendly Finance Company.

QUADRUPLE-ACCREDITED, WORLD-RANKED



Lancaster University
Management School

Figure 24.2 Interest-Rate Swap Payments



QUADRUPLE-ACCREDITED, WORLD-RANKED



Lancaster University
Management School

Hedging with Interest-Rate Swaps (1 of 2)

- Reduce interest-rate risk for both parties
 1. Midwest converts \$1m of fixed rate assets to floating/variable rate assets
 2. Friendly Finance converts \$1m of floating /variable rate assets to fixed rate assets

*They would do this to better match their interest rate assets/liabilities
i.e.*

Suppose Midwest had a lot of variable rate liabilities to match

Suppose Friendly Finance had a lot of fixed rate liabilities to match

QUADRUPLE-ACCREDITED, WORLD-RANKED



Interest Rate Swap

- Two parties agree to exchange periodic interest payments
- Typically a fixed-rate (swap rate) for a floating rate
 - But “fixed against fixed” and “floating against floating” swaps also exist
- Floating rate based on some short-run money market reference rate (e.g. LIBOR, Treasury bill rate)
- Interest payments based on a notional principal (also called a notional amount)
 - The amount each party agrees to pay is the agreed interest rate times the notional principal
 - The only monies exchanged between the parties are the interest payments

Interest Rate Swap

- Purpose
 - To convert a fixed-rate asset (or liability) into a floating-rate asset (or liability) and vice versa
 - Used by companies to alter their interest rate exposures and bring them in line with management's appetite for interest rate risk (e.g. hedging)
 - Risk management tool for banking, corporate finance and fixed income portfolio managers

Swap spread

- **Swap spread:** The spread that the fixed-rate payer agrees to pay above the Treasury yield with the same term to maturity as the swap
Swap rate= yield of a Treasury with the same maturity+ swap spread
- Measure the cost of short-term borrowing over the Treasury rate
 - Are highly correlated with corresponding credit spreads

Swap spread

- Example:
 - Party A agrees to pay Party B periodic interest rate payments of LIBOR + 50 bps in exchange for periodic interest rate payments of 3%
 - There is no exchange of principal amounts
 - Interest payments are computed assuming a “notional” principal amount
 - Interest payments are settled in net.
 - E.g. if LIBOR + 50 bps is 1.2% then Party A receives 1.8% and pays B nothing
 - In this example, the swap rate is equal to 3% (the fixed rate)

Hedging with Interest-Rate Swaps

- Advantages of swaps
 1. Reduce risk, no change in balance-sheet
 2. Longer term than futures or options
- Disadvantages of swaps
 1. Lack of liquidity
 2. Subject to default risk
- Financial intermediaries help reduce disadvantages of swaps (but at a cost!)

QUADRUPLE-ACCREDITED, WORLD-RANKED



Lancaster University
Management School

Credit Derivatives

- Credit derivatives are a relatively new derivative offering payoffs based on changes in credit conditions along a variety of dimensions. Almost nonexistent twenty years ago, the notional amount of credit derivatives today is in the trillions.
- Credit derivatives are contracts where the payoff depends on the creditworthiness of one or more companies or countries

QUADRUPLE-ACCREDITED, WORLD-RANKED



Credit Derivatives

- Credit derivatives can be generally categorized as credit options, credit swaps, credit default swaps and credit-linked notes. We will only look at the most important of these = **credit default swaps.**
- Credit Default Swaps developed from 1990s reaching a notional outstanding of from \$61.2 trillion at end-2007 to \$9.4 trillion 10 years later

QUADRUPLE-ACCREDITED, WORLD-RANKED



Credit Default Swap (CDS)

- The CDSs are the most popular credit derivative.
- It is an insurance contract over the default of an underlying debt over a specified period of time.
- Most common maturities: 1-year, 3-year, 5-year, 7-year, 10-year
- Notional principal: the total face value of the underlying bonds
- **Protection buyer:** buys a CDS contract to get protection from the default risk of a company or country
- **Protection seller:** sells a CDS contract to become exposed to the credit risk of a company or country
- **Payoff** from the seller to the buyer in case of a default (or credit event) by the underlying debt.

Credit Default Swap (CDS)

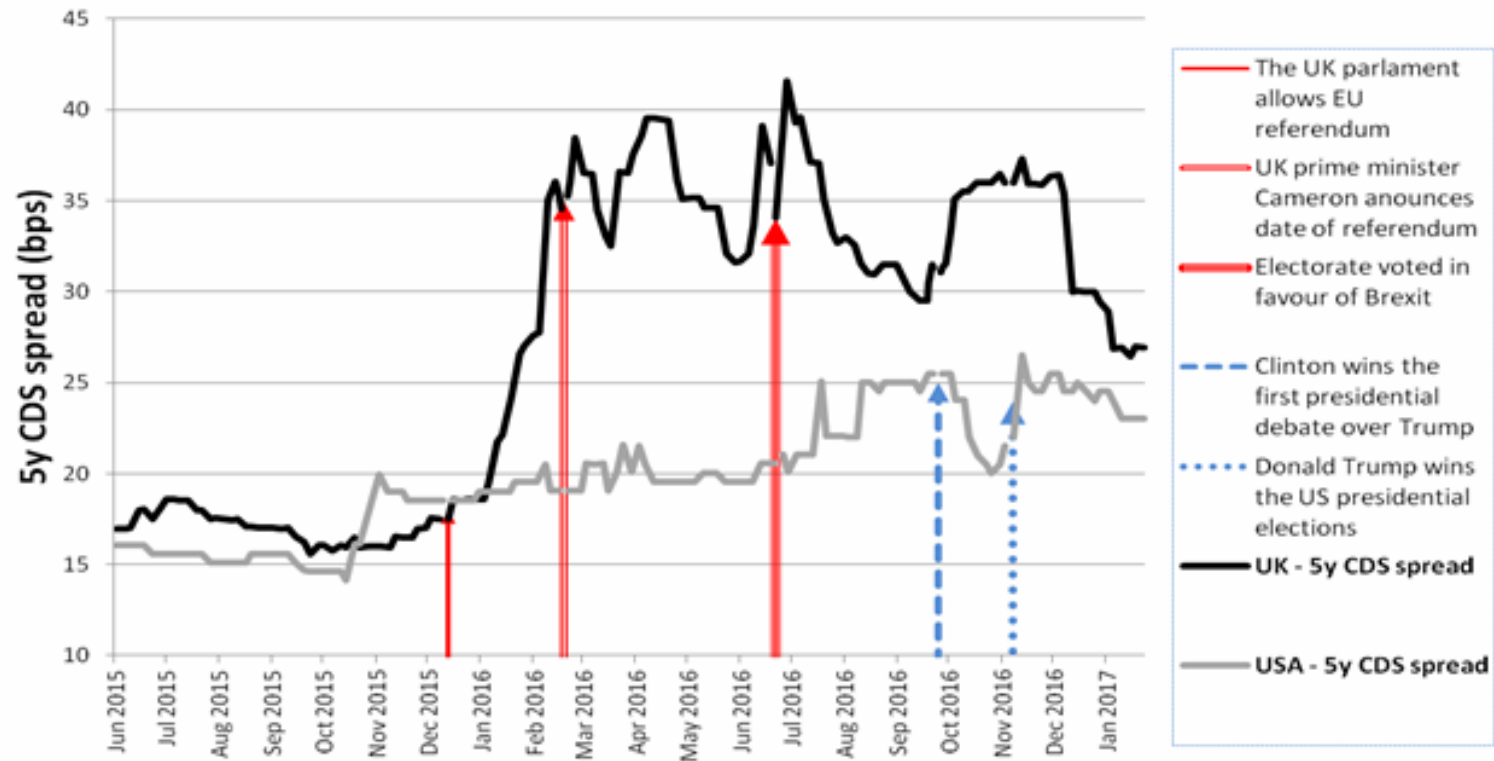
- **CDS spread, CDS premium, or CDS rate:** total amount paid per year, as a percent of the notional principal, to buy protection. The premium is paid in periodic payments (typically each quarter) to the seller until the maturity of the CDS contract or until a credit event.
- The settlement in the event of default involves a cash payment from the seller to the buyer.
- Loss Given Default% (1- Recovery Rate%): Loss payment from the protection seller to the protection buyer in the credit event



Example of a CDS trade:

- A bank decides to insure its exposure to the Greek Government bond and buys a 5-year Greek CDS contract on the 30th December 2010 at a CDS spread of 1021 bps and for a \$10 million notional amount.
- The protection buyer has to pay an annual premium of $0.1021 \times \$10\text{million} = \1.021 million
- Greece defaults on March 9th, 2012 according to ISDA.
- On March 19th, 2012 there is a bond auction to determine the recovery rate (21.5%) and the protection buyer receives as a compensation \$7.85 million (100% less a **recovery rate** of 21.5%) less the accrued interest.
- Since the total net exposure of market participants who sold CDS credit protection on Greek sovereign debt was approximately \$3.18bn as of March 9th, 2012, the aggregate amount payable was approximately $\$3.18\text{bn} \times (1 - 21.5\%) = \2.5bn
- *Credit default swaps written by AIG covered more than \$440 billion in bonds*
- *Reuters "It seems possible that AIG, alone, could bring the global economy to something of a standstill"*

UK & US CDS Spreads during Political Events



Are derivatives a time bomb? (1 of 5)

- In the annual report for Berkshire Hathaway, Warren Buffett referred to derivatives (bought for speculation) as “...weapons of mass destruction.” (although also noting that Berkshire uses derivatives). Is he right?



QUADRUPLE-ACCREDITED, WORLD-RANKED

Are derivatives a time bomb? (2 of 5)

- There are three major concerns with the use of financial derivatives:
 - Derivatives allow financial institutions to increase their leverage (effectively changing their capital), possibly to take on more risk
 - Derivatives are too complicated
 - The derivative positions of some banks exceed their capital—the probability of failure has greatly increased

QUADRUPLE-ACCREDITED, WORLD-RANKED



Are derivatives a time bomb? (3 of 5)

- As usual, the blanket comments are usually not accurate.
- For example, although the notional amount of derivatives exceeds capital, often these are offsetting positions on behalf of clients—the bank has no exposure. In other words, you have to look at each situation individually. Further, actual derivative losses by banks is small, despite a few news-worthy exceptions.

QUADRUPLE-ACCREDITED, WORLD-RANKED



Are derivatives a time bomb? (4 of 5)

- Of course, the 2007-2009 financial crisis only further illustrates the problem of speculative derivatives. AIG, for example, sought fee revenue from taking the short side of credit default swaps.
- Unfortunately, when housing prices collapsed, they had to payout on those positions, resulting in billions in losses.

QUADRUPLE-ACCREDITED, WORLD-RANKED



Are derivatives a time bomb? (5 of 5)

- In the end, derivatives do have their dangers but only along with other current day financial risks.
- For sure, derivatives have changed the sophistication needed by both managers and regulators to understand the whole picture.

QUADRUPLE-ACCREDITED, WORLD-RANKED



Lancaster University
Management School