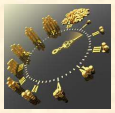
KHOA KINH TẾ VÀ QUẢN TRỊ



LECTURE 8

Chapter 23:

Risk Management

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Chapter 23: Risk Management

- **Learning Objectives:**
  1. Understand why companies hedge to reduce risk
  2. Use Option, Futures, and Forward contracts to devise simple hedging strategies
  3. Explain how companies can use swaps to change the risk of securities that they have issued

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Chapter 23: Risk Management

- **Main Contents:**
  1. Why hedge ?
  2. Reducing Risk with Options
  3. Futures contracts
  4. Forward contracts
  5. Swaps
  6. Innovation in the Derivatives Market

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I. Why Hedge ?

❖ ***The evidence on Risk Management:***

- Three principal ways to manage risks:
  - Building flexibility into its operation
  - Buying an insurance policy against such hazards as fire, accidents, and theft
  - Entering into specialized financial contracts (Derivatives) that fix its costs or prices
- The aim of hedging program:
  - To reduce the likelihood of financial distress
  - To improve the firm's assess to debt finance

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II. Reducing Risk with Options

- *CALL Option*
- *PUT Option*
- *Buy Option on currencies, interest rate, and commodities to limit the downside risk*
- *Options traded on Option exchanges or OTC market*

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II. Reducing Risk with Options

(cont'd)

Company

•The principal material is crude oil
•Expecting the price of crude oil would go up
•To protect, the firm buys 6-month call option of 1,000 barrels at the strike price of $90, the price of the option is $3 per barrel

	Oil Price (dollars per barrel)		
	$80	$90	$100
Cost of 1,000 barrels	$80,000	$90,000	$100,000
– Payoff on call options	0	0	10,000
Net cost	$80,000	$90,000	$90,000

– *The firms has protected itself against increases in the oil price with the cost of $3,000*

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II. Reducing Risk with Options
(cont'd)

Company ABC

- *Supply the crude oil*
- *The loss occurs as the oil price falls down*
- *To protect itself, the firm buy a put option of 1,000 barrels at the strike price of $90 per barrel, the price of the option is $3 per barrel*

	Oil Price (dollars per barrel)		
	$80	$90	$100
Revenue from 1,000 barrels	$80,000	$90,000	$100,000
+ Payoff on put option	10,000	0	0
Total revenues	$90,000	$90,000	$100,000

– *The firms has protected itself against decreases in the oil price with the cost of $3,000*

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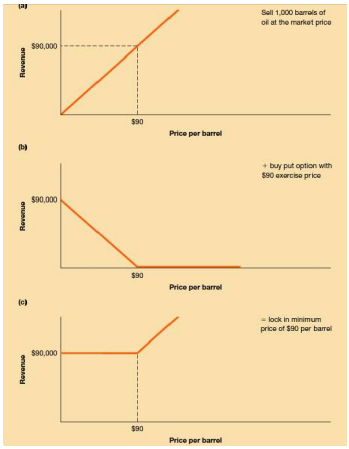

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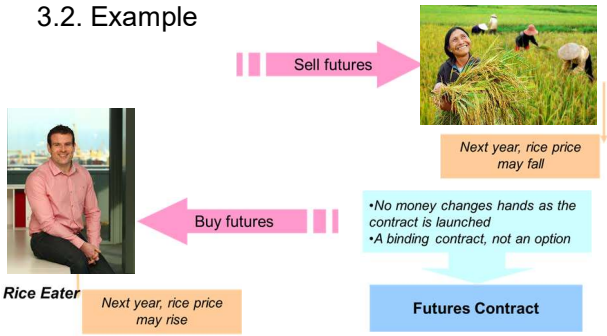
III. Risk Management with future contract

3.1. Definition

A contractual agreement, generally made on the trading floor of a futures exchange, to buy or sell a particular commodity or financial instrument at a pre-determined price in the future.

III. Risk Management with future contract

3.2. Example



III. Futures Contracts

- *Futures Contract*
  - *Exchange-traded*
  - *Standardized*
  - *Promise to buy or sell an asset in the future at a prespecified price*
- *The characteristics of Futures Contracts:*
  - *No money changes hands when a futures contract is entered into*
  - *The contract is a binding obligation to buy or sell at a fixed price at contract maturity*
  - *As the date for delivery approaches, the futures contracts becomes more and more like a spot contracts*
  - *As the date for delivery approaches, the price of the futures contract snuggles up to the spot price*
- *Profit to Seller (*)*
- *Profit to Buyer (*)*

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III. Risk Management with future contract

The farmer sold 5,000 bushels of September rice futures at a price of $9 per bushel

In September, as the futures contract matures, the price of rice is only $8 a bushel, the farmer buys back the rice futures at $8 just before maturity.

At the same time, he sells his rice at the spot price of $8 a bushel

What are his total receipts ?

Profit on sale and repurchase of futures	$1
Sale of wheat at the September spot price	8
Total receipts	$9

III. Futures Contracts (cont'd)

- *Financial Futures*
  - *In financial futures, investors place an order to buy or sell a financial asset at a future date*
  - *To protect investors against fluctuation in short-term and long-term interest rate, exchange rates, and the level of share prices*

TABLE 24–2 Some financial futures contracts

Contract	Principal Exchange
U.S. Treasury notes and bonds	CBT
Eurodollar deposits	IMM
Standard & Poor's Index	IMM
Euro	IMM
Yen	IMM
German government bonds (Bunds)	Eurex

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IV. Risk Management with Forward contracts

Definition

Agreement to buy or sell an asset in the future at an agreed price

Custom-tailored futures contract (any maturity date for delivery or any quantity of goods)

Company ABC

•Has ordered memory chips from its Japanese supplier
•The bill for 53 million yen must be paid in 3 months
•The 3-month forward exchange rate is 110 yen per dollar

What can company ABC do to reduce the risk of exchange ?

IV. Forward Contracts

- *Forward Contract*
  - *Agreement to buy or sell an asset in the future at an agreed price*
  - *Custom-tailored futures contract (any maturity date for delivery or any quantity of goods*

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V. Swaps

- *A case of Interest rate risk*
  (by taking the loan of floating-interest rate or issuing the bond with floating coupon rate)
  - *By taking the loan of floating-interest rate*
  - *By issuing the bonds with floating coupon rate*
  - *By holding a portfolio with Long-term Bonds (*)*
  - ***How could Interest Rate Risk be hedged ?***
- *A case of using Currency Swap*

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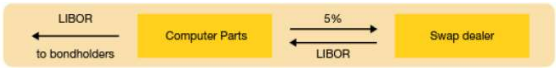
V. swaps

- *A case of Interest rate risk*
- ***How could Interest Rate Risk be hedged ?***



V. swaps

Consider the portfolio manager who is holding a $100 million portfolio of long-term 5% coupon bonds and wishes to reduce price risk by transforming the holdings into a synthetic floating-rate portfolio. Assume that the portfolio currently pays a 5% fixed rate and that swap dealers currently offer terms of 5% fixed for LIBOR. What swap would the manager establish? Show the total income on the fund in a table like Table 24–3, and illustrate the cash flows in a diagram like Figure 24–4.

	LIBOR Rate		
	4.5%	5.0%	5.5%
Interest received on fixed-rate bonds (= .05 × $100 million)	$5,000,000	$5,000,000	$5,000,000
+ Cash flow on swap [= (LIBOR − .05) × notional principal of $100 million]	− 500,000	0	+500,000
Total payment	$4,500,000	$5,000,000	$5,500,000

V. swaps

A case of using Currency Swap

Company Possum
•Wish to borrow 20 mil CHF for its European branch
•The firm can obtain more attractive terms on a dollar loan than a Swiss franc loan
•Therefore, the firm borrows $10 million for 5 years at 5% in the US
•At the same time, the firm arranges a Swap to trade its future dollar liability for Swiss franc

TABLE 24–4 Cash flows from Possum's dollar loan and currency swap (figures in millions)

	Year 0		Years 1–4		Year 5	
	$	SFr	$	SFr	$	SFr
1. Issue dollar loan	+10		−.5		−10.5	
2. Arrange currency swap						
a. Possum receives $	−10		+.5		+10.5	
b. Possum pays SFr		+20		−1.2		−21.2
3. Net cash flow	0	+20	0	−1.2	0	−21.2

VI. Innovation in the Derivatives Market

- *Some new derivative contracts could be possibly invented every day*
- *Derivative dealers try to identify the major business risks, and then design a contract allowing them to lay off these risks*

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Thank you for your attention !

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