

FE620 Pricing and Hedging

Lecture 2: Future Markets

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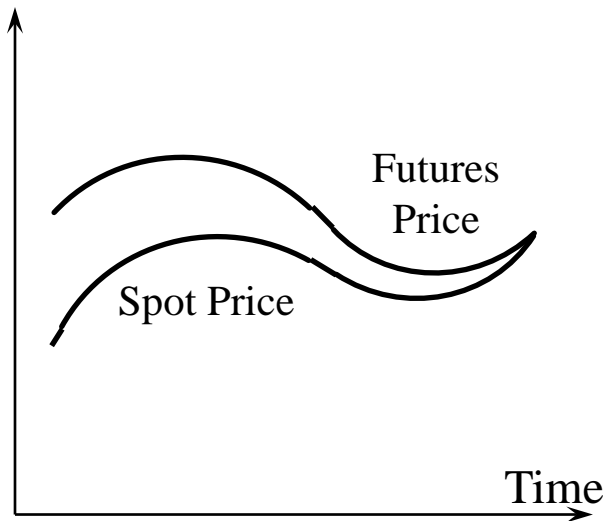
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Futures Contracts

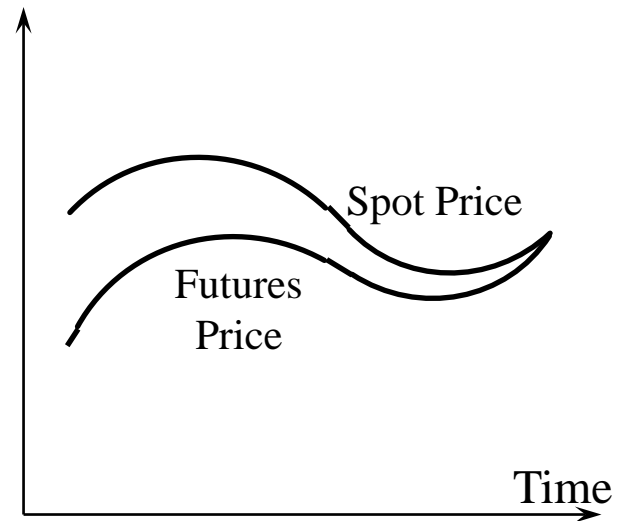
- ▶ Available on a wide range of assets
- ▶ Exchange traded
- ▶ Specifications need to be defined:
 - What can be delivered,
 - Where it can be delivered, &
 - When it can be delivered
- ▶ Settled daily

Convergence of Futures to Spot

(Figure 2.1, page 29)



(a)



(b)

Margins

- ▶ A margin is cash or marketable securities deposited by an investor with his or her broker
- ▶ The balance in the margin account is adjusted to reflect daily settlement
- ▶ Margins minimize the possibility of a loss through a default on a contract

Margin Cash Flows

- ▶ A trader has to bring the balance in the margin account up to the initial margin when it falls below the maintenance margin level
- ▶ A member of the exchange clearing house only has an initial margin and is required to bring the balance in its account up to that level every day.
- ▶ These daily margin cash flows are referred to as variation margin
- ▶ A member is also required to contribute to a default fund

Example of a Futures Trade (page 29–31)

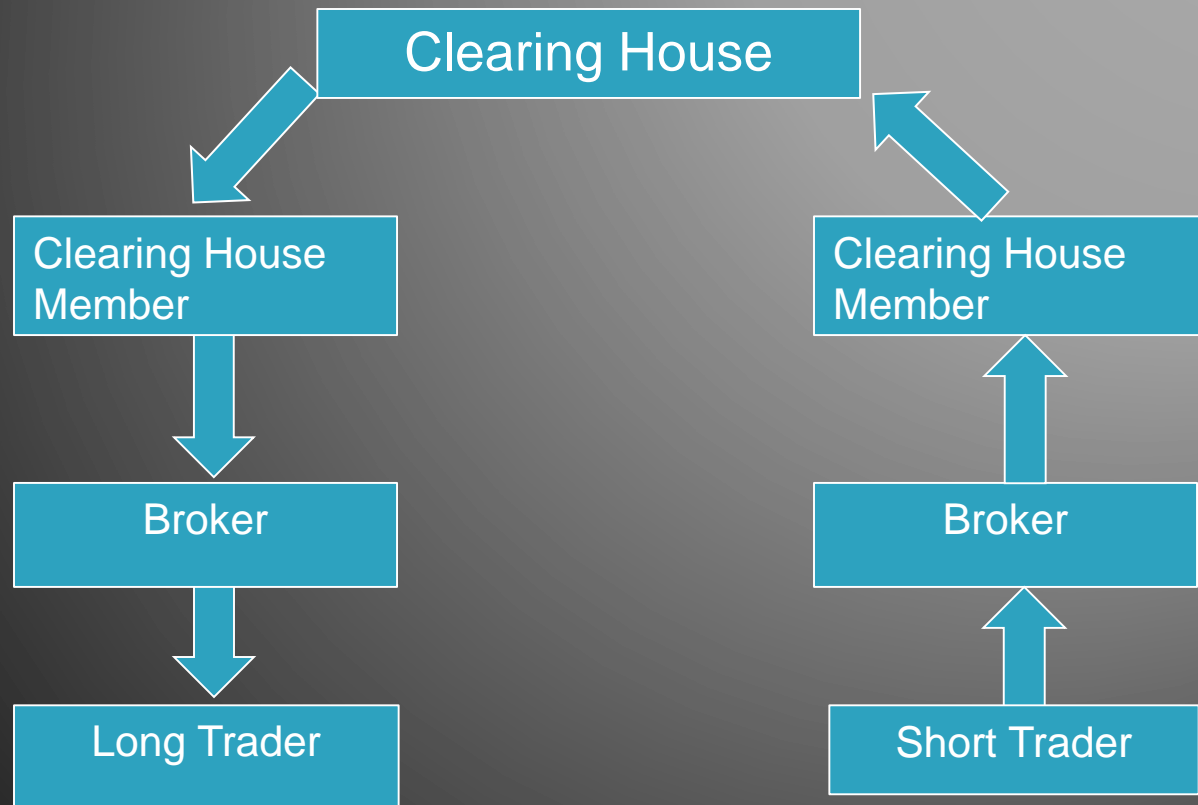
- ▶ An investor takes a long position in 2 December gold futures contracts on June 5
 - contract size is 100 oz.
 - futures price is US\$1,250
 - initial margin requirement is US\$6,000/contract (US\$12,000 in total)
 - maintenance margin is US\$4,500/contract (US\$9,000 in total)

A Possible Outcome (Table 2.1, page 30)

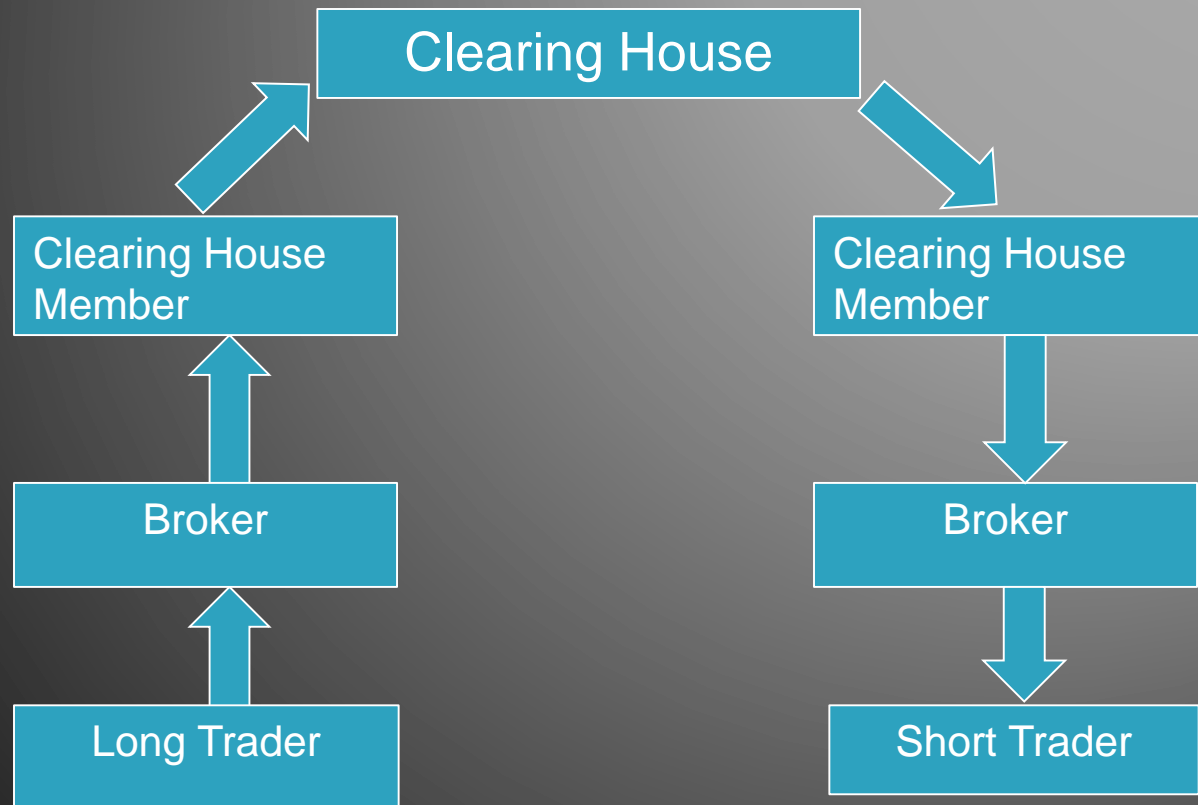
Day	Trade Price (\$)	Settle Price (\$)	Daily Gain (\$)	Cumul. Gain (\$)	Margin Balance (\$)	Margin Call (\$)
1	1,250.00				12,000	
1		1,241.00	−1,800	− 1,800	10,200	
2		1,238.30	−540	−2,340	9,660	
.....		
6		1,236.20	−780	−2,760	9,240	
7		1,229.90	−1,260	−4,020	7,980	4,020
8		1,230.80	180	−3,840	12,180	

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Margin Cash Flows When Futures Price Increases



Margin Cash Flows When Futures Price Decreases



Some Terminology

- ▶ Open interest: the total number of contracts outstanding
 - equal to number of long positions or number of short positions
- ▶ Settlement price: the price just before the final bell each day
 - used for the daily settlement process
- ▶ Volume of trading: the number of trades in one day

Key Points About Futures

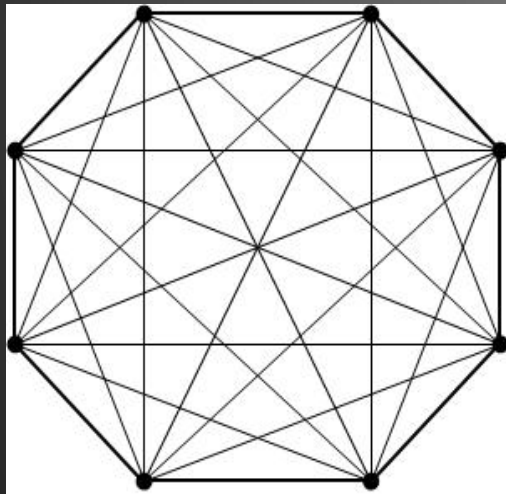
- ▶ They are settled daily
- ▶ Closing out a futures position involves entering into an offsetting trade
- ▶ Most contracts are closed out before maturity

Crude Oil Trading on May 3, 2016

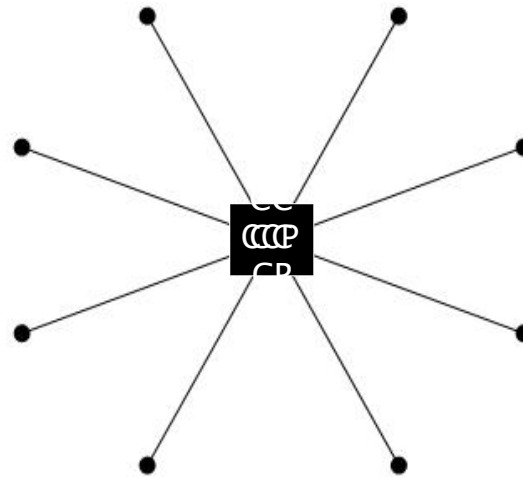
(Table 2.2, page 37)

	Open	High	Low	Prior Settle	Last Trade	Change	Volume
Jun 2016	44.92	45.35	43.36	44.78	43.51	−1.27	503,259
Aug 2016	46.02	46.45	44.63	45.91	44.82	−1.09	50,439
Dec 2016	47.09	47.55	45.99	47.09	46.24	−0.85	41,447
Dec 2017	48.75	49.17	47.83	48.72	48.16	−0.56	13,032
Dec 20158	50.27	50.40	49.30	49.99	49.59	−0.40	1,618

OTC Transactions: Bilateral Clearing vs Central Clearing



Bilateral Clearing



Clearing through a single CCP

Bilaterally Cleared Transactions

- ▶ Usually governed by an ISDA Master agreement with a credit support annex (CSA)
- ▶ The agreement explains the rights of one party if the other party defaults
- ▶ The CSA defines the collateral which must be posted
- ▶ If one party defaults, the other party is entitled to keep any collateral that has been posted up to what is necessary to settle its claims
- ▶ Traditionally CSAs have required variation margin but not initial margin (e.g., LTCM in Business Snapshot 2.2)

New Regulations

- ▶ New regulations for trades between financial institutions that are not cleared centrally require the financial institutions to have CSAs where both initial margin and variation margin are posted
- ▶ The initial margin is posted with a third party

Delivery

- ▶ If a futures contract is not closed out before maturity, it is usually settled by delivering the assets underlying the contract. When there are alternatives about what is delivered, where it is delivered, and when it is delivered, the party with the short position chooses.
- ▶ A few contracts (for example, those on stock indices and Eurodollars) are settled in cash

Questions

- ▶ When a new trade is completed what are the possible effects on the open interest?
- ▶ Can the volume of trading in a day be greater than the open interest?

Types of Orders

- ▶ Limit
- ▶ Stop-loss
- ▶ Stop-limit
- ▶ Market-if touched
- ▶ Discretionary
- ▶ Time of day
- ▶ Open
- ▶ Fill or kill

Regulation of Futures

- ▶ In the US, the regulation of futures markets is primarily the responsibility of the Commodity Futures and Trading Commission (CFTC)
- ▶ Regulators try to protect the public interest and prevent questionable trading practices

Accounting & Tax

- ▶ Ideally hedging profits (losses) should be recognized at the same time as the losses (profits) on the item being hedged
- ▶ Ideally profits and losses from speculation should be recognized on a mark-to-market basis
- ▶ Roughly speaking, this is what the accounting and tax treatment of futures in the U.S. and many other countries attempt to achieve

Forward Contracts vs Futures Contracts

(Table 2.3, page 43)

FORWARDS	FUTURES
Private contract between 2 parties	Exchange traded
Non-standard contract	Standard contract
Usually 1 specified delivery date	Range of delivery dates
Settled at end of contract	Settled daily
Delivery or final cash settlement usually occurs	Contract usually closed out prior to maturity
Some credit risk	Virtually no credit risk

Foreign Exchange Quotes

- ▶ Futures exchange rates are quoted as the number of USD per unit of the foreign currency
- ▶ Forward exchange rates are quoted in the same way as spot exchange rates. This means that GBP, EUR, AUD, and NZD are quoted as USD per unit of foreign currency. Other currencies (e.g., CAD and JPY) are quoted as units of the foreign currency per USD.