Chapter 17

Futures Markets and Risk Management

Trading Strategies

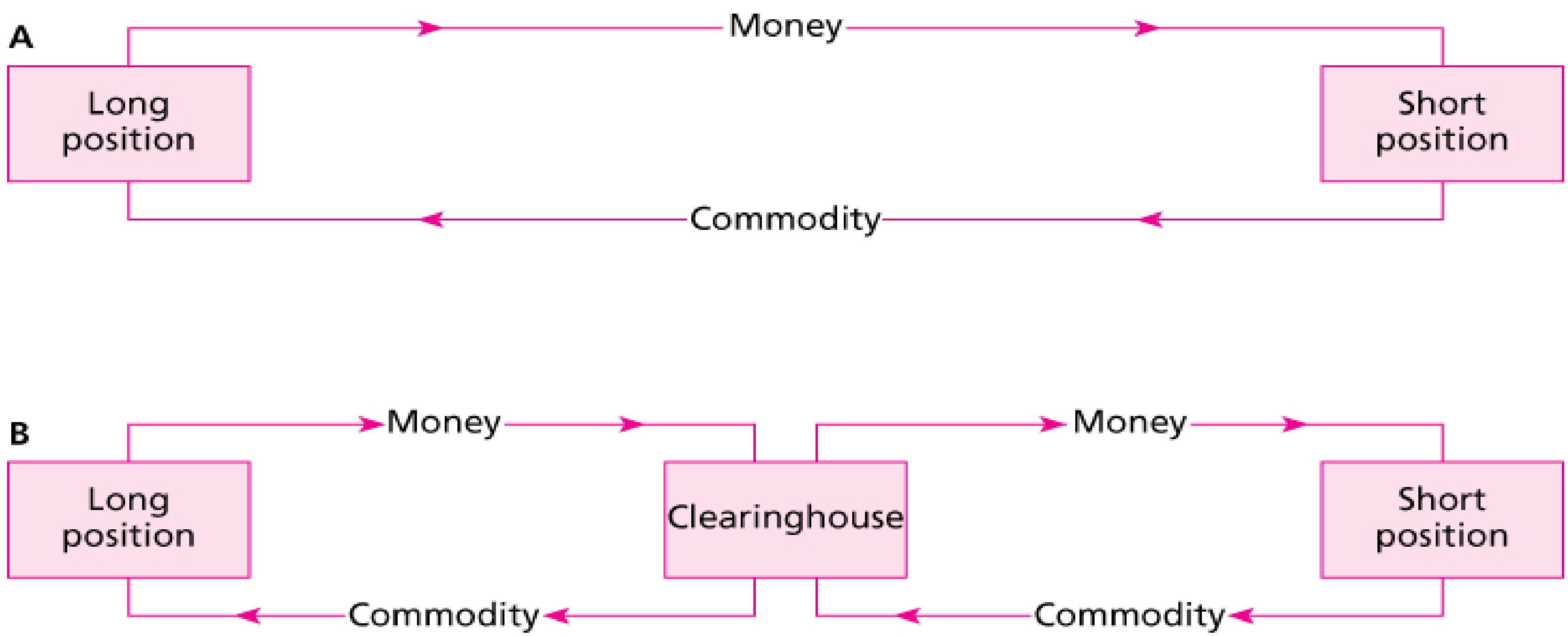
Speculation -
– short - believe price will fall
– long - believe price will rise

Hedging -
– long hedge - protecting against a rise in price
– short hedge - protecting against a fall in price

Futures Markets

- Eurex – owned by Deutsche Borse and Swiss exchange, electronic, largest in the world
- CBOT – adopted Eurex's trading platform for Treasury futures
- CME – use Globex trading sysyem
- In 2007 CBOT and CME merged into CME Group

Figure 17.3 Trading With and Without a Clearinghouse



The clearinghouse eliminates counterparty default risk; this allows anonymous trading since no credit evaluation is needed. Without this feature you would not have liquid markets.

The Clearinghouse and Open Interest

- Clearinghouse - acts as a party to all buyers and sellers.
  - A futures participant is obligated to make or take delivery at contract maturity

- Closing out positions
  - Reversing the trade
  - Take or make delivery
  - Most trades are reversed and do <u>not</u> involve actual delivery

- Open Interest
  - The number of contracts opened that have not been offset with a reversing trade: measure of future liquidity

Marking to Market and the Margin Account

- Initial Margin: funds that must be deposited in a margin account to provide capital to absorb losses

- Marking to Market: each day the profits or losses are realized and reflected in the margin account.

- Maintenance or variance margin: an established value below which a trader's margin may not fall.

Margin Arrangements

- Margin call occurs when the maintenance margin is reached, broker will ask for additional margin funds

Marking to Market Example

Day	Futures Price
0 (today)	$12.10
1	12.20
2	12.25
3	12.18
4	12.18
5 (delivery)	12.21

Day	Profit (loss) per Ounce	× 5,000 Ounces/Contract = Daily Proceeds
1	$12.20 − $12.10 = $ .10	$500
2	12.25 − 12.20 = .05	250
3	12.18 − 12.25 = −.07	−350
4	12.18 − 12.18 = 0	0
5	12.21 − 12.18 = .03	150
	F_t - F_{t-1} at each point in time	Sum = $550

More on futures contracts

- Convergence of Price: As maturity approaches the spot and futures price converge

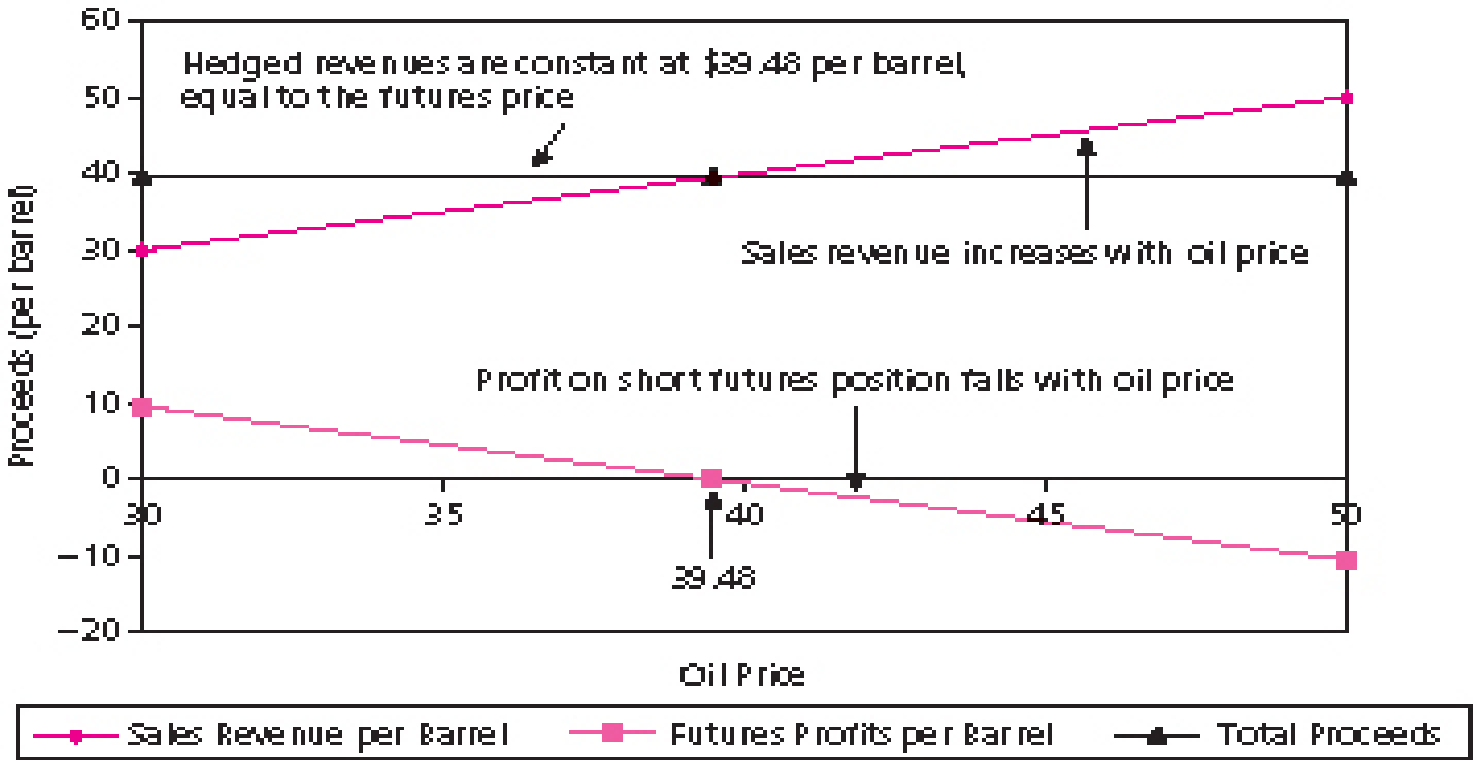
$$F_T = S_T$$

- Delivery: Specifications of when and where delivery takes place and what can be delivered

- Cash Settlement: Some contracts are settled in cash rather than delivering the underlying assets

Figure 17.4 Hedging Revenues Using Futures, Example 17.5 (Futures Price = $39.48)

Insert Figure 17.4 here



Futures Pricing

- ***Spot-futures parity theorem*** - two ways to acquire an asset for some date in the future

– Purchase it now and store it

– Take a long position in futures

– These two strategies must have the same market determined costs

Parity Example Using Gold

Strategy 1: Buy gold now at the spot price (S_0) and hold it until time T when it will be worth S_T

Strategy 2: Enter a long position in gold futures today and invest enough funds in T-bills (F_0) so that it will cover the futures price of S_T

Parity Example Using Gold

	Action	Initial Cash Flow	Cash Flow at Time T
Strategy A:	Buy gold	$-S_0$	S_T
Strategy B:	Enter long position	0	$S_T - F_0$
	Invest $F_0/(1 + r_f)^T$ in bills	$-F_0/(1 + r_f)^T$	F_0
	Total for strategy B	$-F_0/(1 + r_f)^T$	S_T

Price of Futures with Parity

Since the strategies have the same flows at time T:

$$F_O / (1 + r_f)^T = S_O$$
$$F_O = S_O (1 + r_f)^T$$

The futures price has to equal the carrying cost of the gold

Deviations from parity arbitraged away:

Gold has spot price (S_0) of $900, risk free rate is .5%. The a 6-month maturity contract should have a price of:

$F_O = S_O\,(\,1 + r_f)^T = \$900(1.005)6 = \$927.34.$

Suppose instead six months maturity futures specify the price of $928.

Action	Initial Cash Flow	Cash Flow at Time *T* (6 months)
Borrow $900, repay with interest at time *T*	+$900	$-\$900(1.005)^6 = -\$927.34$
Buy gold for $900	−900	S_T
Enter short futures position (F_0 = $928)	0	$928 - S_T$
Total	$ 0	$.66

Deviations from parity arbitraged away:

Action	Initial Cash Flow	Cash Flow at Time T
1. Borrow S_0	$+S_0$	$-S_0(1 + r_f)^T$
2. Buy gold for S_0	$-S_0$	S_T
3. Enter short futures position	0	$F_0 - S_T$
Total	0	$F_0 - S_0(1 + r_f)^T$