Financial Markets and Instruments (Lecture 1)

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U LISBOA | UNIVERSIDADE DE LISBOA

LISBOA SCHOOL OF ECONOMICS & MANAGEMENT

ISEG SINCE 1911

Program

- 1. Introduction to financial markets and instruments.
- 2. Financial markets: an historic perspective.
- 3- The major institutions of the financial sector.
- 4. Managing investment portfolios.
- 5. Perspectives about crises in financial markets and economic crises

- 1. Introduction to financial markets and instruments.
- 1.1 What is a financial instrument and its return?
- 1.2 Stock markets.
- 1.3 Other vehicles to invest in the ownership of firms.
- 1.4 Debt markets.
- 1.5 Derivative investment products.
- 1.5.1 Futures.
- 1.5.2 Options.
- 1.5.3 Other derivatives.
- 1.6 Transaction costs.
- 1.7 Risks associated to financial activities.

- 2. Financial markets: an historic perspective.
- 2.1 Origins, tendencies and developments at middle ages and the renaissance.
- 2.2 Advances and retrievals at creating investment markets (1720-1815).
- 2.3 Developments and tendencies at the XIXth century.
- 2.4 The integration of financial markets at the beginning of the XXth century.
- 2.1 Crises, crashes and control (1914-1939).
- 2.2 Financial markets after the second world war.
- 2.8 Transatlantic developments (1970-90)
- 2.9 The great globalization of financial markets after 1990.

- 3- The major institutions of the financial sector.
- 3.1 Commercial banks and deposit management institutions.
- 3.2 Investment banks and investment companies.
- 3.3 Insurance companies.
- 3.4 Other financial corporations.
- 3.5 Regulators and supervisors.

- 4. Managing investment portfolios.
- 4.1 Investment and risk.
- 4.2 Portfolio and efficient investment theory
- 4.3 Techniques for selecting investments into shares.
- 4.3.1 Identifying the structure of the return correlations.
- 4.3.2 Identifying the efficient frontier.
- 4.3.3 Models to anticipate expected returns.
- 4.3.4 Choosing potential investments.
- 4.3.5 Empirical evidence on models for estimating expected returns.
- 4.4 Techniques for selection and investment into debts portfolios.
- 4.4.1 Theories about interest rates and bond prices.
- 4.4.2 Managing debt portfolios.
- 4.5 How to assess investment portfolios?
- 4.6 Roadmap to behavioral finance and behavior economics.

- 5. Perspectives about crises in financial markets and economic crises.
- 5.1 Different types of financial crises.
- 5.2 Indicators of (eventual) crises.
- 5.3 Comparing crises trough history.
- 5.4 Discussing a contagious effect of financial and economic crises.
- 5.5 The concept of rational market and the actual existence of crises.

- **Key references:**

- Ranald Michie. 2006. The Global Securities Markets: a History. Oxford University Press.
- Edwin Elton; Martin Gruber; Stephen Brown e William Goetzmann. 2011. Modern Portfolio Theory and Investment Analysis. Internacional Student Version. John Willey and Sons.
- Carmen Reinhart and Keneth Rogoff. 2009. This Time is Different: Eight Centhuries of Financial Folly. Princeton University Press.

- **Additional readings:**

- Glenn Arnold. 2010. Investing: the Definitive Companion to Investment and the Financial Markets. Second Ediction. Prentice Hall/ Finantial Times.

- Justin Fox. 2010. The Myth of the Rational Market: a History of Risk, Reward, and Delusion on Wall Street. Harriman House.

- Nouriel Roubini and Stephen Mihm. 2010. Crisis Economics: a Crash Course in the Future of Finance. Penguin Books.

- Marry Buffet and David Clark. 2008. Warren Buffett and the Interpretation of Financial Statements: The Search for the Company with a Durable Competitive Advantage. Scribner.

- Anthony Saunders e Marcia Millon Connet, 2008. Financial Institutions Management. McGraw-Hill International Edition.

- **Assessment:**
-
- Maximum (AP*0.30+ FE*0.70; FE)
-
- Where
- AP: Assignments and participation in class.
- FE: Final exam.
-

- 1) Group report (3,500 words maximum) about the the historical developments of the Portuguese capital markets and their integration into the Euronext.

- 2) Group management of a real-life investment portfolio of 1 million Euros at the stocktrak.com plataform.

STOCK|TRAK
GLOBAL PORTFOLIO SIMULATIONS

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- 1.1 What is a financial instrument and its return?

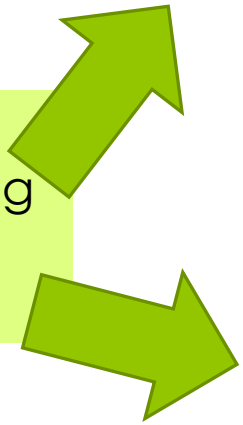
Introductory concepts

- Risk and investment effort sharing.
- Limited liability.

- Primary market and secondary market.

- A firm's capital structure may contain:
  - Ordinary shares.
  - Preferred shares.
  - Bonds
  - Bank loans
  - Rights
  - Convertible bonds.

Two major forms of return from investing in shares



Two major forms of return from investing in shares

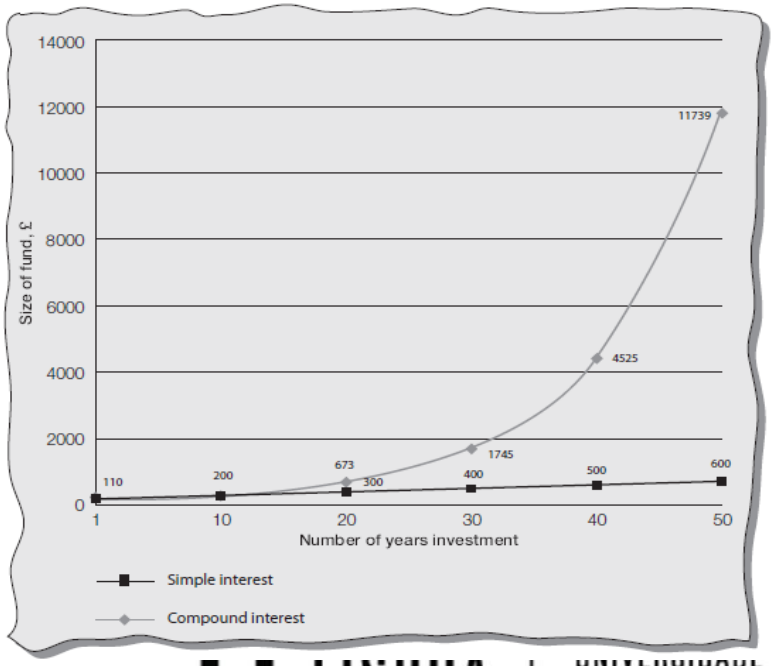
Dividends

Added share value

- Bonds' return and the distinction to shares' return
- Extreme events of when a firm is liquidated or falls bankrrupt.

Simple interest versus compound interest

Exhibit 2.1 demonstrates the power of compounding. It shows the difference in the size of a pot of money at various points in the future when the pot is allowed to grow at simple interest (i.e. interest on the initial capital only) and compound interest (each year interest is added to the pot and future interest is paid on both the initial capital and the interest that has accumulated from previous years). The figures are based on an initial investment of £100 with annual interest of 10 per cent. At simple interest a £100 fund becomes worth only £600 after 50 years. However, if interest is received on accumulated interest (compound interest) the £100 is turned into £11,739.[2]



- Interest with fixed rate and variable rate.

- Return from the most looked after financial investments:

Table 2.1 What a £100 investment in 1900 would be worth at the beginning of 2001, with all income reinvested

	If invested in equities (shares)	If invested in government bonds (gilts)
Money (nominal) return	£1,616,000	£20,300
Real return	£29,150	£370

Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns* (Princeton University Press, 2002).

Table 2.2 Real returns on UK financial securities (per cent per annum) and the value of an initial investment of £100 at the end of the period

	101 years (1900–1.1.2001)[a]	51 years (1950–1.1.2001)[a]	25 years (1976–1.1.2001)[a]	10 years (1993–1.1.2003)[b]	3 years (2000–1.1.2003)[b]
Equities	5.8%	8.6%	10.9%	3.9%	−15.9%
	£29,150	£6719	£1328	£147	£60
Gilts	1.3%	1.6%	7.1%	7.2%	4.4%
	£370	£225	£556	£200	£114
Building society accounts[c]		(41 years 1960–2001) 1.5%	2.2%	1.9%	2.9%
		£181	£173	£121	£109
Inflation[c]	4%	6.1%	6.3%	2.5%	2.2%

[a] Source: Dimson *et al.*, *Triumph of the Optimists*. (for equities and gilts only)
[b] Source: Barclays Capital, *Equity-Gilt Study* (2003), 48th edition.

Table 2.3 Real rates of return (% p.a.)

	Equities	Gilts
1900–1909	1.8	−0.2
1910–1919	−1.3	−9.2
1920–1929	9.3	8.3
1930–1939	2.6	5.9
1940–1949	3.1	0.7
1950–1959	13.7	−2.3
1960–1969	6.5	−1.5
1970–1979	−1.4	−4.4
1980–1989	15.4	7.5
1990–2000	9.3	8.9

Source: Dimson *et al.*, *Triumph of the Optimists*.

Table 2.4 Real returns on equities and government bonds: an international comparison, 1900–2000 (% p.a.)

	Equities	Bonds
Sweden	7.6	2.4
Australia	7.5	1.1
South Africa	6.8	1.4
USA	6.7	1.6
Canada	6.4	1.8
The Netherlands	5.8	1.1
UK	5.8	1.3
Switzerland	5.0[a]	2.8
Ireland	4.8	1.5
Denmark	4.6	2.5
⋮	⋮	⋮
Japan	4.5	−1.6
France	3.8	−1.0
Spain	3.6	1.2
Germany	3.6	−2.2[b]
Italy	2.7	−2.2
Belgium	2.5	−0.4

[a] From 1911.
[b] Excluding 1922–23.

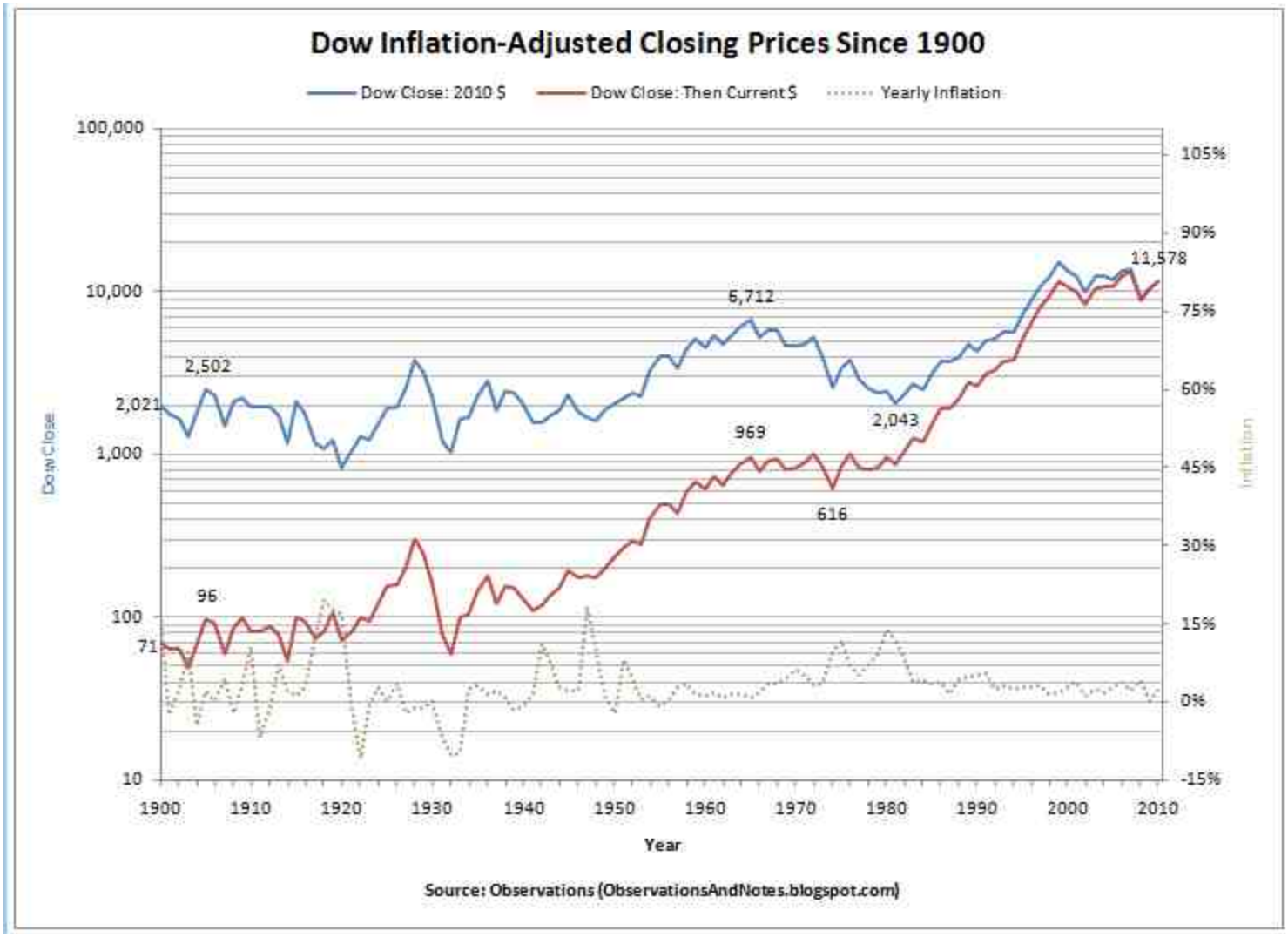
Source: Dimson *et al.*, *Triumph of the Optimists*.

Table 2.5 Performance of equities relative to gilts 1900–2002

	Length of holding period in years				
	2	3	4	5	10
Equities outperform gilts, number of periods	71	78	80	77	80
Equities underperform gilts, number of periods	31	23	20	22	14
Total number of periods	102	101	100	99	94
Equity outperformance proportion of periods	70%	77%	80%	78%	85%

Source: Barclays Capital, *Equity-Gilt Study* (2003), 48th edition.

- What about the risk that is associated to each asset?


Dow Inflation-Adjusted Closing Prices Since 1900
Dow Close: 2010 $
Dow Close: Then Current $
Yearly Inflation
100,000
10,000
2,021
1,000
100
71
10
105%
90%
75%
60%
45%
30%
15%
0%
-15%
11,578
6,712
2,502
2,043
969
616
96
Dow Close
Inflation
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
Year
Source: Observations (ObservationsAndNotes.blogspot.com)

- 1.2 Stock markets.

What activities are performade by stock exchanges?

- 1- Supervision of transactions to assure efficency and transparency.
- 2- Authorization for trading and internal regulations.

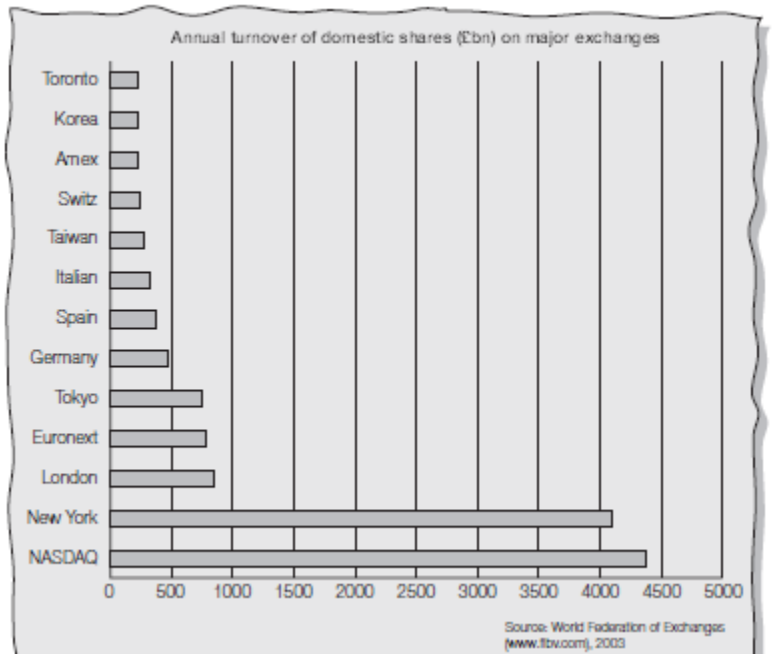
- 3- Criation of environment for timely price identification.
- 4- Fast and efficient flow of information.

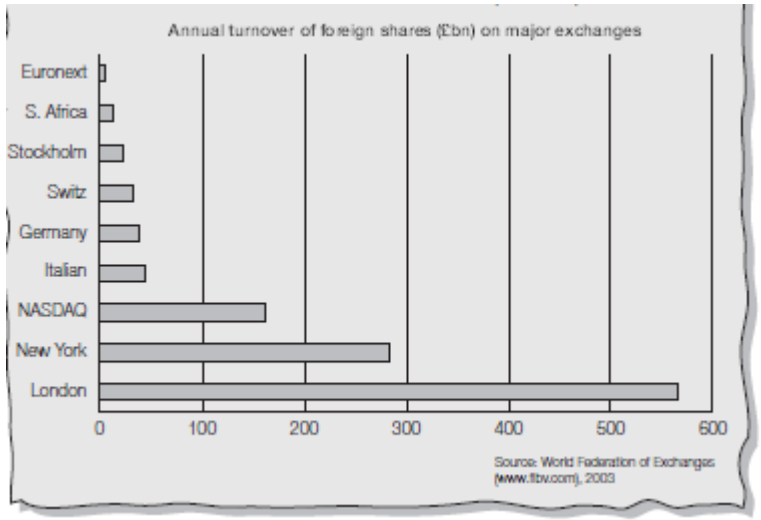
- 5- Clearing and settlement of transactions.

- 6- Sanctions and penalizations to deviant behavior and actions.

Electronic transactions versus "*floor*" transactions

Turnover figure





Niche stock exchanges (Exemple LSE)

Investment stats

Table 3.2 Ownership of quoted shares in Britain, distribution by sector (%)

Sector	1963	1975	1989	1997
Individuals	54.0	37.5	17.7	20.5
Pension funds	6.4	16.8	34.2	27.9
Insurance cos.	10.0	15.9	17.3	23.1
Others (banks, public sector, unit trusts, overseas, etc.)	29.6	29.6	30.8	28.5

Source: Office for National Statistics. Crown Copyright 1997. Reproduced by permission of the Controller of HMSO and the Office for National Statistics.

Activities performed by financial intermediates

- 1)Order execution.
- 2) Advisement.
- 3) Financial funds management.

Where to find information about stocks in the internet

- www.euronext.com
- http://www.google.com/finance
- http://www.digitallook.com
- http://www.iii.co.uk

- http://www.reuters.com/finance/markets
- http://www.bloomberg.com/markets

- http://www.proquote.com/
- www.fool.com

- 1.3 Other vehicles to invest in the ownership of firms.

- Instead of directly investing in stocks, investment funds are an alternative.

Related topics

- Portfolio diversification
- Scale investment and transaction costs.
- Professional management.
- Less investment control.

Exemplos

- Open-ended unit trusts.
- Open-ended investment companies.

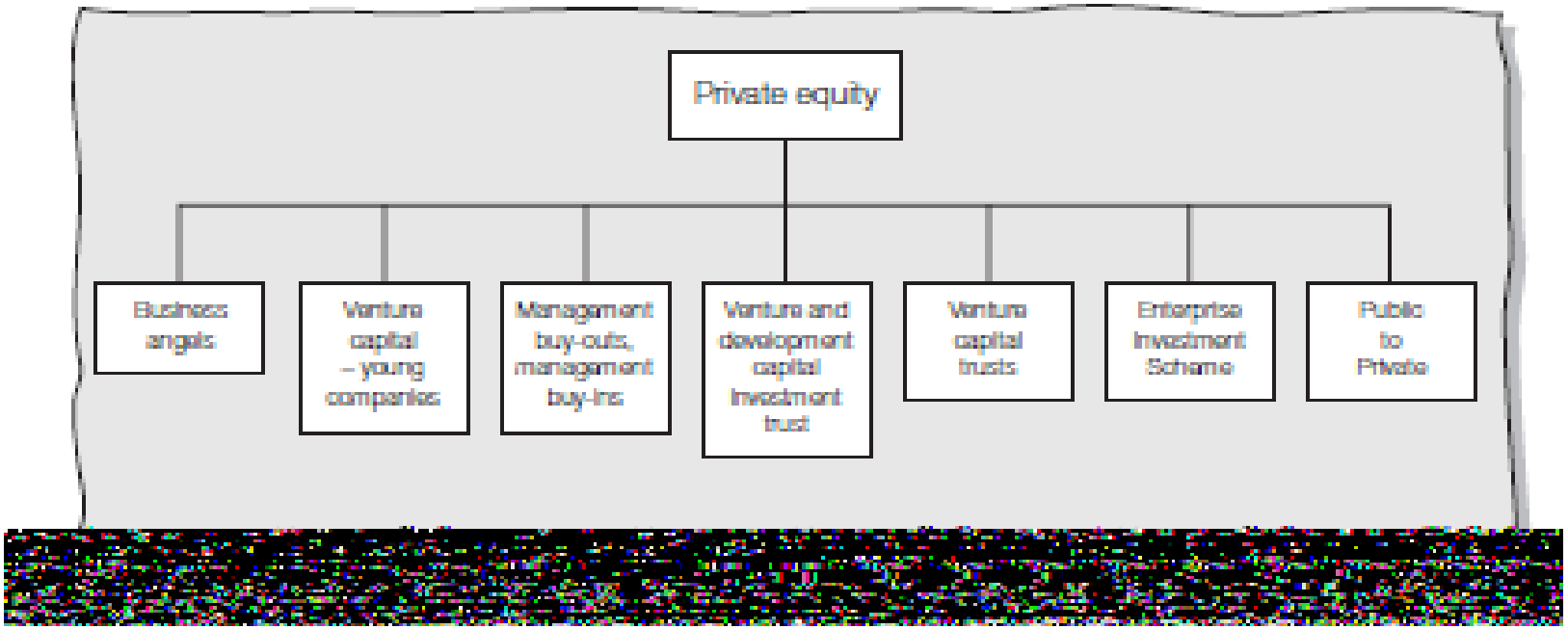
- Exchange traded funds (ETFs)
- Closed-endend trusts (investment companies)

- Hedge Funds

- Online examples:

- https://www.fidelity.co.uk/investor/research-funds/fund-supermarket/default.page

Private equity: investing in stocks outside stock markets.



- The case of preferred shares.

- 1.4 Debt markets.

- Initial concepts: price, cupoun and yield.

Public debt types

- Treasury bonds.
- Treasury notes.
- Treasury tickets.

Corporate debt types

- Common bonds (debentures).
- Notes.
- Monetary market instruments (e.g. commercial paper).
- Convertible debt.
- Debt with warrants.

Interest rate types

- Fixed rate.
- Discount debt securities.
- Variable rate.

Amortization types

- Fixed maturity.
- Fixed maturity with options (either to buyer or seller)
- Perpectual securities.

- Contractual convenants.
- High yield (junk) bonds.

Rating

Standard and Poor's	*Moody's*	*Grade*
AAA	Aaa	
AA+	Aa1	
AA	Aa2	
AA–	Aa3	
A+	A1	Investment-grade bonds
A	A2	
A–	A3	
BBB+	Baa1	
BBB	Baa2	
BBB–	Baa3	
BB+	Ba1	
BB	Ba2	
BB–	Ba3	
B+	B1	
B	B2	Non-investment-grade, High-yield, or 'junk' bonds
B–	B3	
CCC+	Caa1	
CCC	Caa2	
CCC–	Caa3	
CC	Ca	
C	C	

Exhibit 6.2 Moody's and Standard and Poor's rating scales

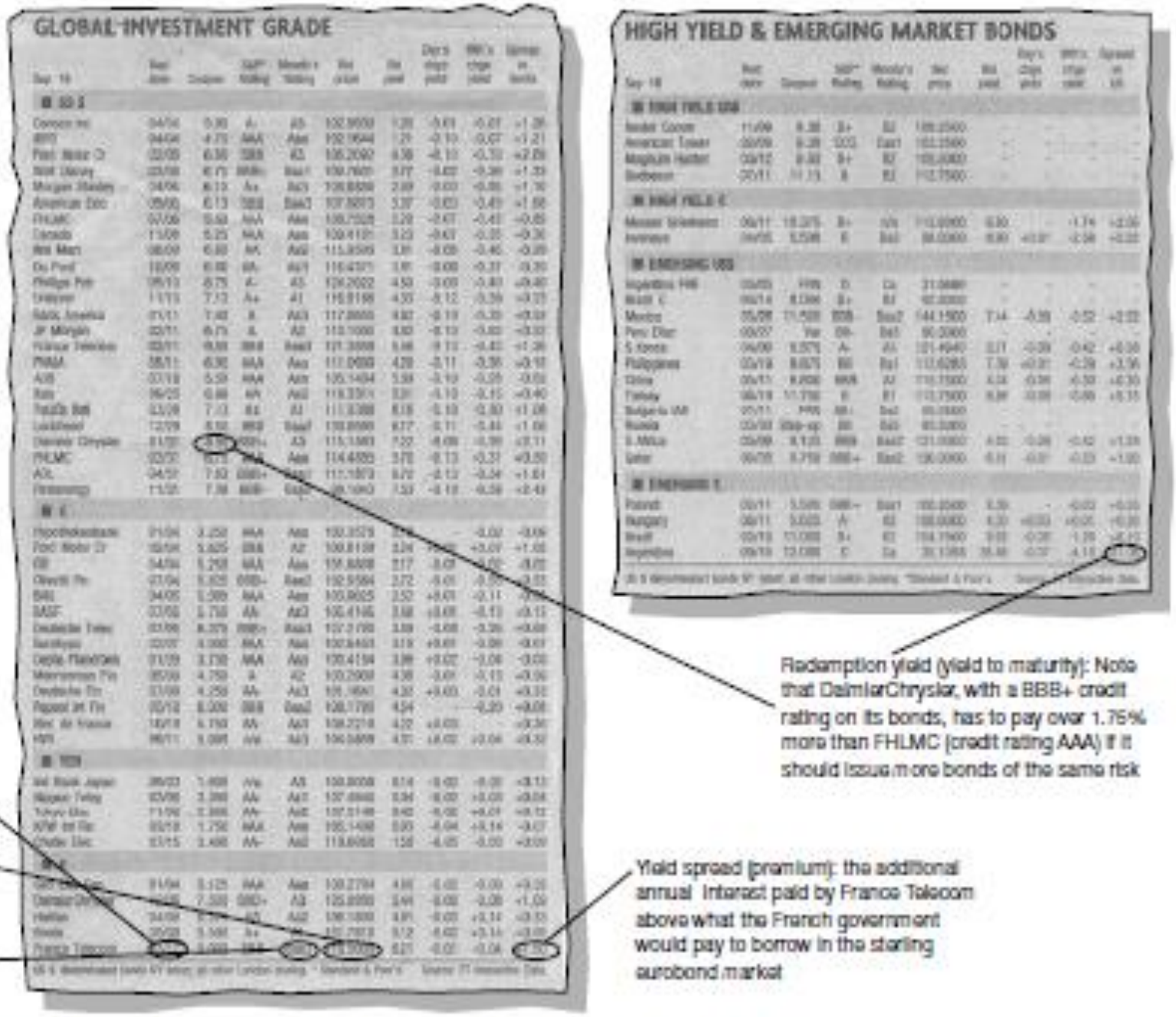


Exhibit 6.3 International bond prices in the *Financial Times*

- http://markets.ft.com/RESEARCH/Markets/bonds
- http://www.reuters.com/finance/bonds

Example of investment funds in bonds

- https://www.fidelity.co.uk/investor/research-funds/fund-supermarket/default.page

- 1.5 Derivative investment products.
- 1.5.1 Futures.
- 1.5.2 Options.
- 1.5.3 Other derivatives.

- A) what is a derivative asset?
- B) the concept of underlying asset.

- Option is a derivative asset that gives the right but not the obligation to buy or sell the underlying asset against payment of the initial premium to purchase the option

- Two major types of options: call options and put options.

- Long position (buyer) and short position (seller).

Exemple: call option over 1000 shares from Cadbury

	Call option prices (premiums) pence		
Exercise price	**January**	**April**	**July**
390p	41.5	48.5	54.5
420p	24.5	32.5	39.5
Share price on 31.10.02 = 416p			

Exhibit 8.1 Call options on Cadbury Schweppes shares, 31 October 2002

Suppose that the exercise price was 390 pence by share.

	Assumptions on share price in January at expiry		
	700p	**416p**	**300p**
Cost of purchasing shares by exercising the option	£3,900	£3,900	£3,900
Value of shares bought	£7,000	£4,160	£3,000
Profit from exercise of option and sale of shares in the market	£3,100	£260	Not exercised
Less option premium paid	£415	£415	£415
Profit (loss) before transaction costs	£2,685	−£155	−£415
Percentage return over 3 months	647%	−37%	−100%

Exhibit 8.2 Profits and losses on the January 390 call option following purchase on 31 October

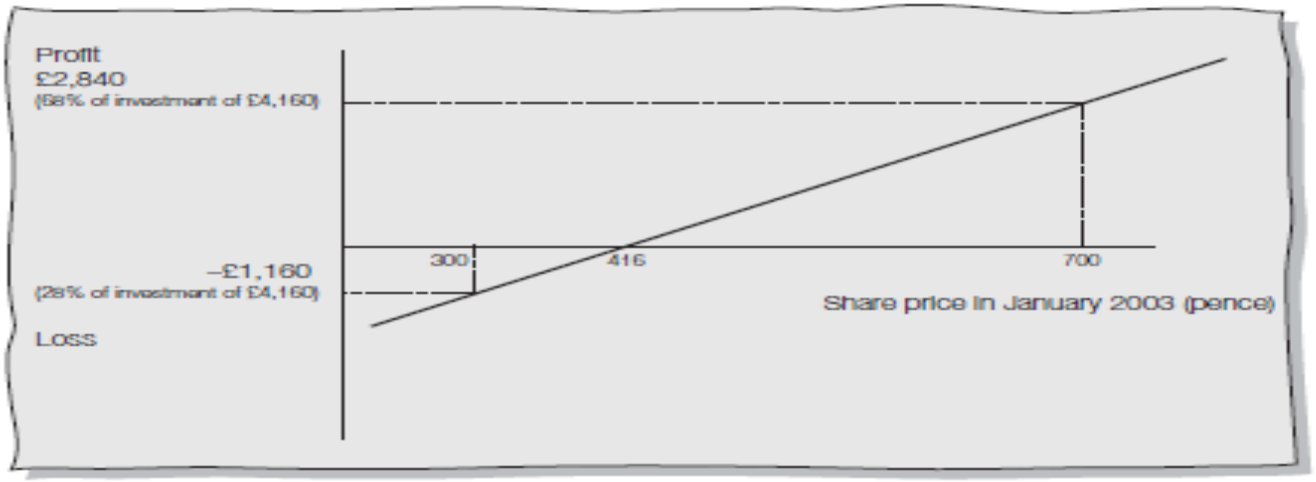


Exhibit 8.3 Profit if 1,000 shares in Cadbury Schweppes are bought on 31 October 2002 at 416p

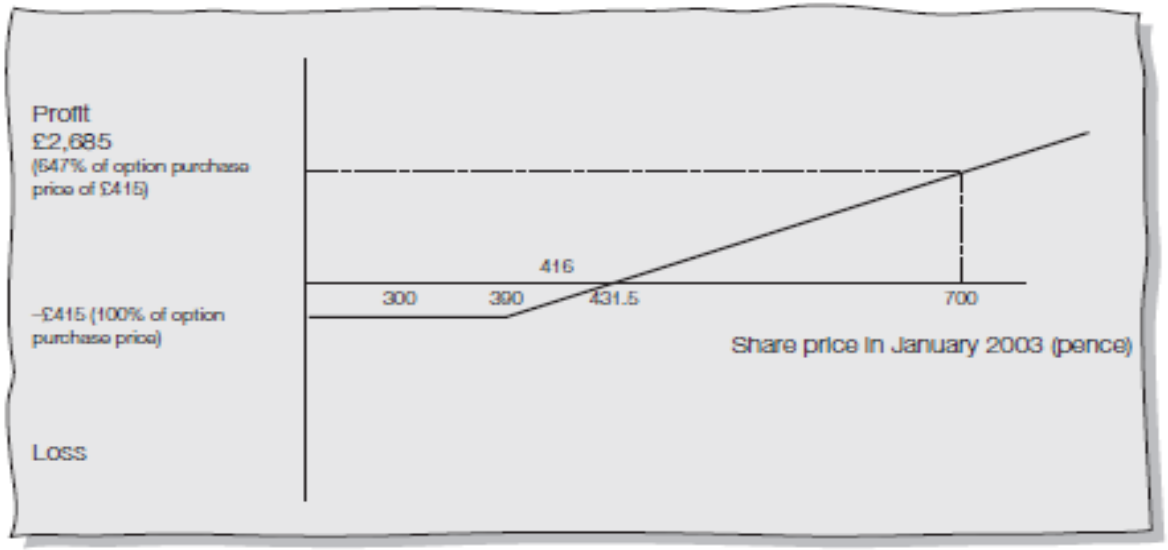


Exhibit 8.4 Profit if one 390 January call option contract (for 1,000 shares) in Cadbury Schweppes is purchased on 31 October 2002 and held to maturity

The short position over the call option

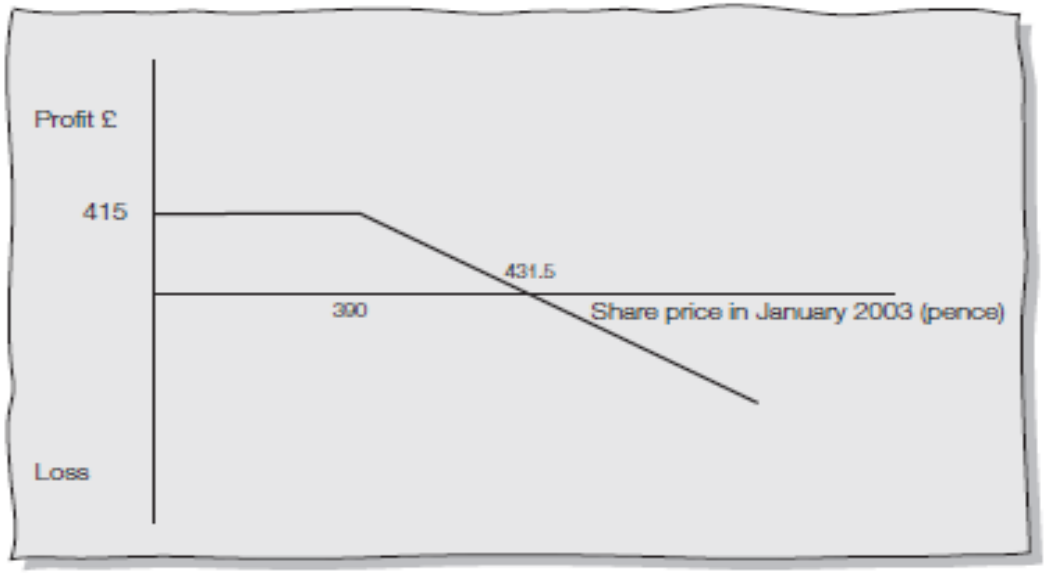


Exhibit 8.5 The profit to a call option writer on one 390 January call contract written on 31 October 2001

- The put option case

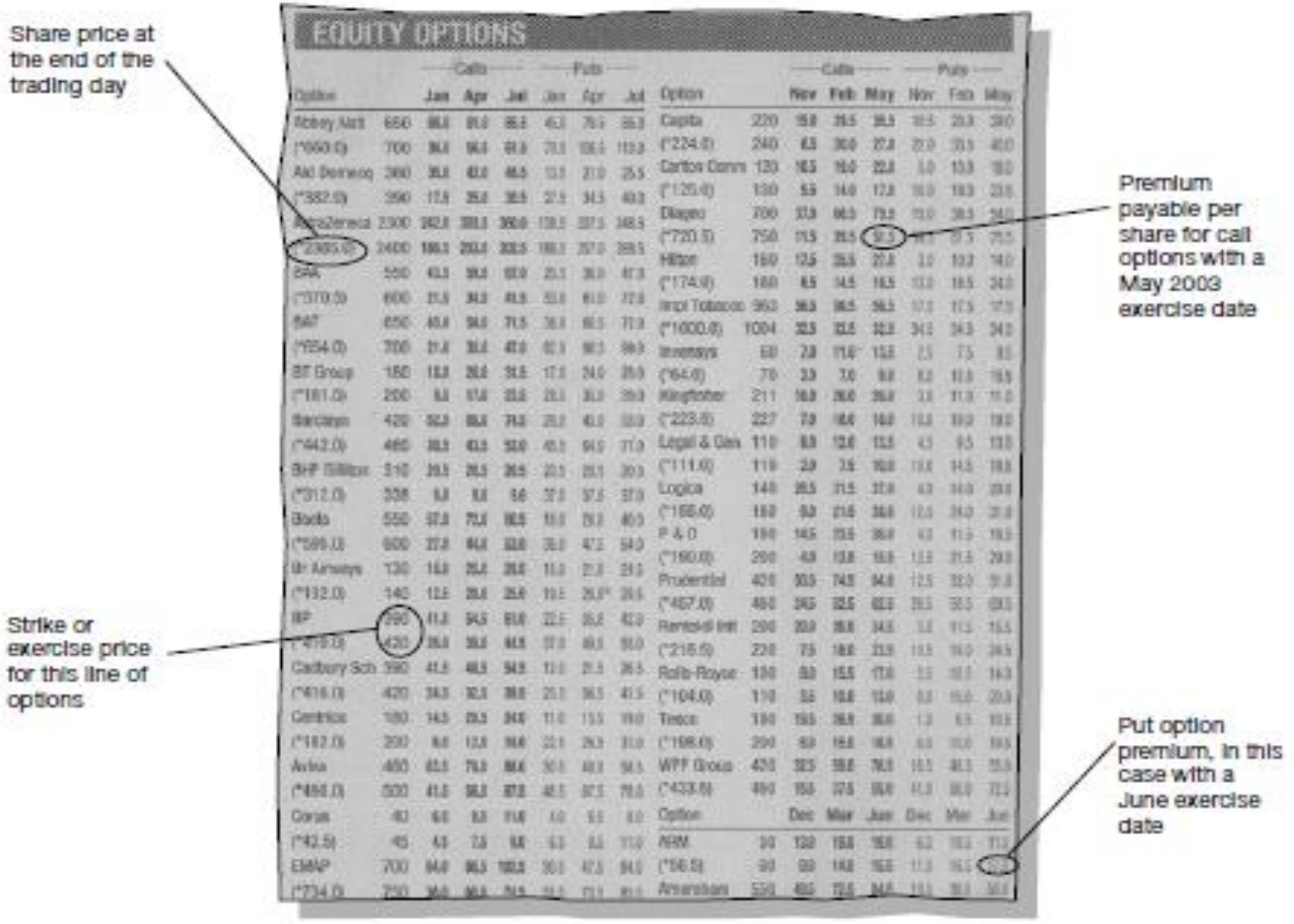


Exhibit 8.6 LIFFE equity options prices in the *Financial Times*

Source: *Financial Times* 1 November 2002

Managing risk through options

Diageo share price falls to	Loss on 10,000 shares	Loss on 10 call options
700	£2,050	£3,950
650	£7,050	£3,950
600	£12,050	£3,950
550	£17,050	£3,950
500	£22,050	£3,950

Exhibit 8.7 Losses on alternative buying strategies

Options over stock indexes

■ **FTSE 100 INDEX OPTION** (Euronext.liffe) £10 per full index point — 31 Oct

	3725		3825		3925		4025		4125		4225		4325		4425	
	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P
Nov	319	24½	235½	41	162½	68	102½	108	56½	162	28	233	11½	316½	4	409
Dec	388½	87½	315	113½	247½	145½	187	184½	136	233	93½	289½	61½	357½	37½	432½
Jan	429½	120	356	146	289½	178½	229½	217½	176½	263½	131	317½	95	380½	65½	450½
Feb	472½	156½	403½	187½	339½	223½	279½	263½	227	311	180½	364½	140½	424½	106	490
Mar	477	194	410	225½	346½	260	287½	300	233	344	186½	395½	144½	452½	111	517½

Calls 47,687; Puts 43,334 . * Underlying index value. Premiums shown are based on settlement prices.

Exhibit 8.8 FTSE 100 index option prices

Source: *Financial Times* 1 November 2002

- Furture contract: a contract traded in a capital market to buy and sell a certain underlying asset at a subsequent time

- In this contract there is a right and an obligation to buy / or sell the underlying asset . However, because the contract is standardized and regulated , it can be traded on an exchange before the date of maturity, which often happens .

Asociated concepts

- Margin account
- Maintenaince margin
- Inicial margin.
- Marking to market.
- Clearing house.

COMMODITY PRICES

		Change
Alum HG (cash, t)	$1430-30.5	+6.0
Alum Alloy (cash, t)	$1407-409	+10.5
Copper Gr A (cash, t)	$1814.5-15	+6.3
Lead (cash, t)	$540-1	+0.3
Nickel (cash, t)	$10315-20	+112
Tin: 99.85% (cash, t)	$4940-45	+22.5
Zinc: SHG (cash, t)	$836-6.5	+13.8
Gold close (troy oz)	$385.60-386.10	+0.6
Gold am fix (troy oz)	$385.25	-1.2
Gold pm fix (troy oz)	$385.00	+0.4
Gold - GOFO, 3mth	0.12	nc
Silver fix (troy oz)	522.50c	-3.0
Platinum (troy oz)	$704.0	-3.0
Palladium (troy oz)	$218.0	+4.0
Oil- Brent blend (Oct)	$26.79-0.85	+0.7
Unleaded Gas (95R)	$266-268	+7.0
Gas Oil (German Htg)	$229-231	+5.0
Heavy Fuel Oil	$141-143	+5.0
Naphtha	$248-250	+8.0
Jet fuel	$253-255	+5.0
Diesel (French)	$237-239	+5.0
NBP Gas (Oct)	18.90-19.00	-0.4
Euro Gas (Zeebrugge)	20.25-20.35	+0.1
UKPX Spot Index £/Mwh	16.63	+2.1
Contl Power Index €/Mwh	39.2131	+5.2
globalCOALRB Index™ †	$36.25	nc
Barley (Eng. feed)	$9.50	nc
Maize (US No3 Yellow)	$2.60	nc
Wheat (US Dark Nth)	100.0	nc
Rubber (KL RSS no1, c/kg)	427.5	+4.5
Palm Oil (Malay) ‡	430.0	nc
Soyabeans (US)	188.0	-2.0
Cotton A Index (per lb)	66.05c	nc
Wooltops (Super, p/kg)	546.0	nc
Coffee fut (Sep)	$717	+9
Cocoa fut (Dec)	1017	+16
Sugar fut (white, Dec)	$183.5	-1

Sources: LME/Amalgamated Metal Trading, Ibera.org.uk/NM Rothschild, Petroleum Argus, UK power exchange, Platts, Global Coal, Reuters and Euronext.liffe. † US $ per metric tonne, week to date ‡ CIF Rotterdam.

Exhibit 9.1 Commodity spot and futures prices in the *Financial Times*

Source: *Financial Times* 25 September 2003

	Day				
£	Monday	Tuesday	Wednesday	Thursday	Friday
Value of future (based on daily closing price)	50,000	49,000	44,000	50,000	55,000
Buyer's position					
Initial margin	5,000				
Variation margin (+ credited, – debited)	0	–1,000	–5,000	+6,000	+5,000
Accumulated profit or loss	0	–1,000	–6,000	0	+5,000
Seller's position					
Initial margin	5,000				
Variation margin (+ credited, – debited)	0	+ 1,000	+ 5,000	–6,000	–5,000
Accumulated profit (loss)	0	+ 1,000	+ 6,000	0	–5,000

Exhibit 9.2 Example of initial margin, variation margin and marking to market

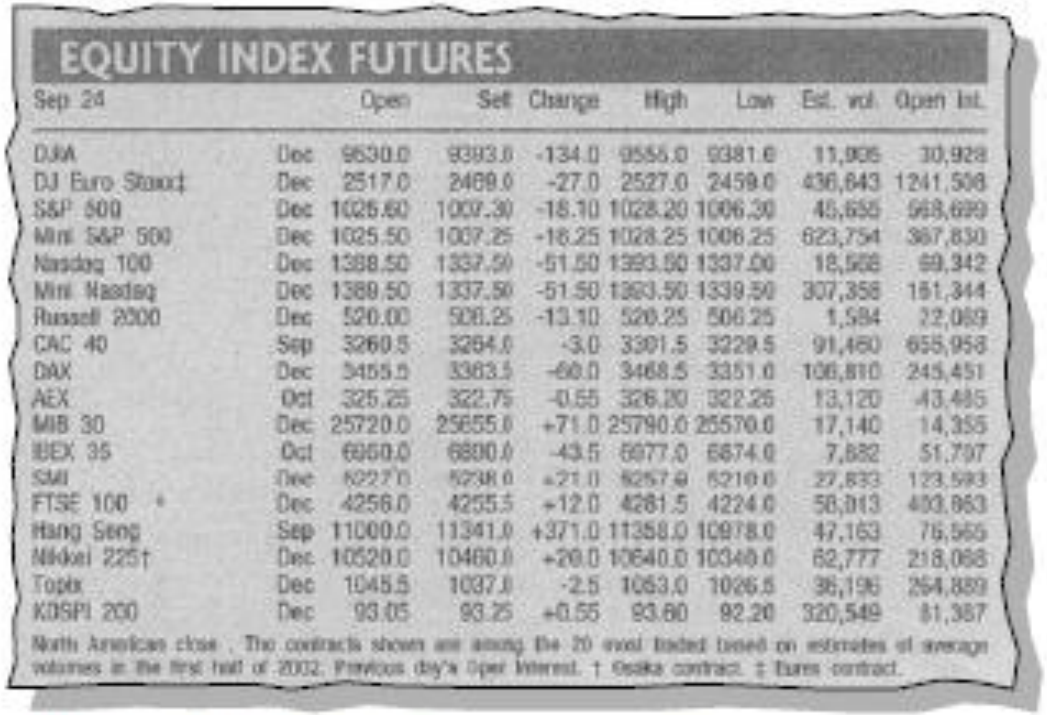
Underlying change (Monday–Friday): $\frac{£55{,}000 - 50{,}000}{£50{,}000} \times 100 = 10\%$

Percentage return to buyer of future: $\frac{£5{,}000 \times 100}{£5{,}000} = 100\%$

Percentage return to seller of future: $\frac{-£5{,}000 \times 100}{£5{,}000} = -100\%$

- The conclusion of the futures contract is usually made in monetary terms (whatever the underlying asset) , and in most cases before the maturity date.

- Examples of future contracts



EQUITY INDEX FUTURES

Sep 24		Open	Sett	Change	High	Low	Est. vol	Open Int.
DJIA	Dec	9630.0	9393.0	-134.0	9555.0	9381.6	11,905	30,928
DJ Euro Stoxx‡	Dec	2517.0	2469.0	-27.0	2527.0	2459.0	436,643	1241,506
S&P 500	Dec	1026.60	1007.30	-18.10	1028.20	1006.30	45,655	968,699
Mini S&P 500	Dec	1025.50	1007.25	-18.25	1028.25	1006.25	623,754	367,830
Nasdaq 100	Dec	1388.50	1337.50	-51.50	1393.50	1337.00	18,568	69,342
Mini Nasdaq	Dec	1389.50	1337.50	-51.50	1393.50	1339.50	307,358	151,344
Russell 2000	Dec	520.00	506.25	-13.10	520.25	506.25	1,584	22,089
CAC 40	Sep	3260.5	3264.0	-3.0	3301.5	3229.5	91,460	655,958
DAX	Dec	3455.5	3363.5	-69.0	3468.5	3351.0	106,810	245,451
AEX	Oct	325.25	322.75	-0.55	326.20	322.25	13,120	43,485
MIB 30	Dec	25720.0	25655.0	+71.0	25790.0	25570.0	17,140	14,355
IBEX 35	Oct	6960.0	6880.0	-43.5	6977.0	6874.0	7,882	51,797
SMI	Dec	5227.0	5238.0	+21.0	5257.0	5210.0	27,833	123,593
FTSE 100 *	Dec	4256.0	4255.5	+12.0	4281.5	4224.0	56,013	493,863
Hang Seng	Sep	11000.0	11341.0	+371.0	11358.0	10978.0	47,163	76,565
Nikkei 225†	Dec	10520.0	10460.0	+20.0	10640.0	10340.0	62,777	218,068
Topix	Dec	1045.5	1037.0	-2.5	1053.0	1026.5	36,196	264,889
KOSPI 200	Dec	93.05	93.25	+0.55	93.60	92.20	320,549	81,387

North American close . The contracts shown are among the 20 most traded based on estimates of average volumes in the first half of 2002. Previous day's Open Interest. † Osaka contract. ‡ Eurex contract.

Exhibit 9.3 Equity index futures table in the *Financial Times*

Source: *Financial Times* 25 September 2003

STOCK FUTURES

Sep 24		Open	Sett price	Change	High	Low	Est. vol	Open int.
BP	Oct		27.16	-1.01			0	0
ENI Spa	Nov		12.67	-0.18			0	0
HSBC Hldgs	Oct		20.79	-0.66			0	50
ING	Nov		52.80	-1.05			0	0
Nokia	Nov		7.50	-0.10			0	0
Royal Dutch	Oct		4.11	+0.01			0	0
Siemens	Nov		4.11	+0.01			0	0
San-Paolo-IMI	Nov		10.42	-0.22			0	0
Total SA	Nov		52.31	+0.01			0	0
Vodafone	Nov		126.50	+2.50			0	0

The stocks shown are a selection made by Euronext.liffe. UK and Italian companies 1000 shares - others 100 shares. A full list of Euronext.liffe Universal Stock Futures is available at www.liffe.com

Exhibit 9.4 Universal stock futures table in the *Financial Times*

Source: *Financial Times* 25 September 2003

Other derivatives

- Swaps.
- Warrants.
- Obrigações convertíveis.

Vital importance of the underlying asset.

Over the counter markets

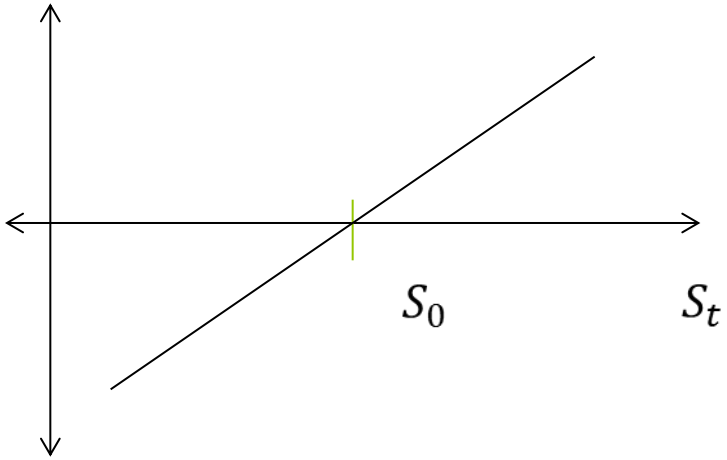
- A product with some characteristics (but not all) of futures and traded on over the counter markets (hence outside the exchange) is called a forward.

- Examples of porfolios with options:

- Payoff the comprar uma acção:

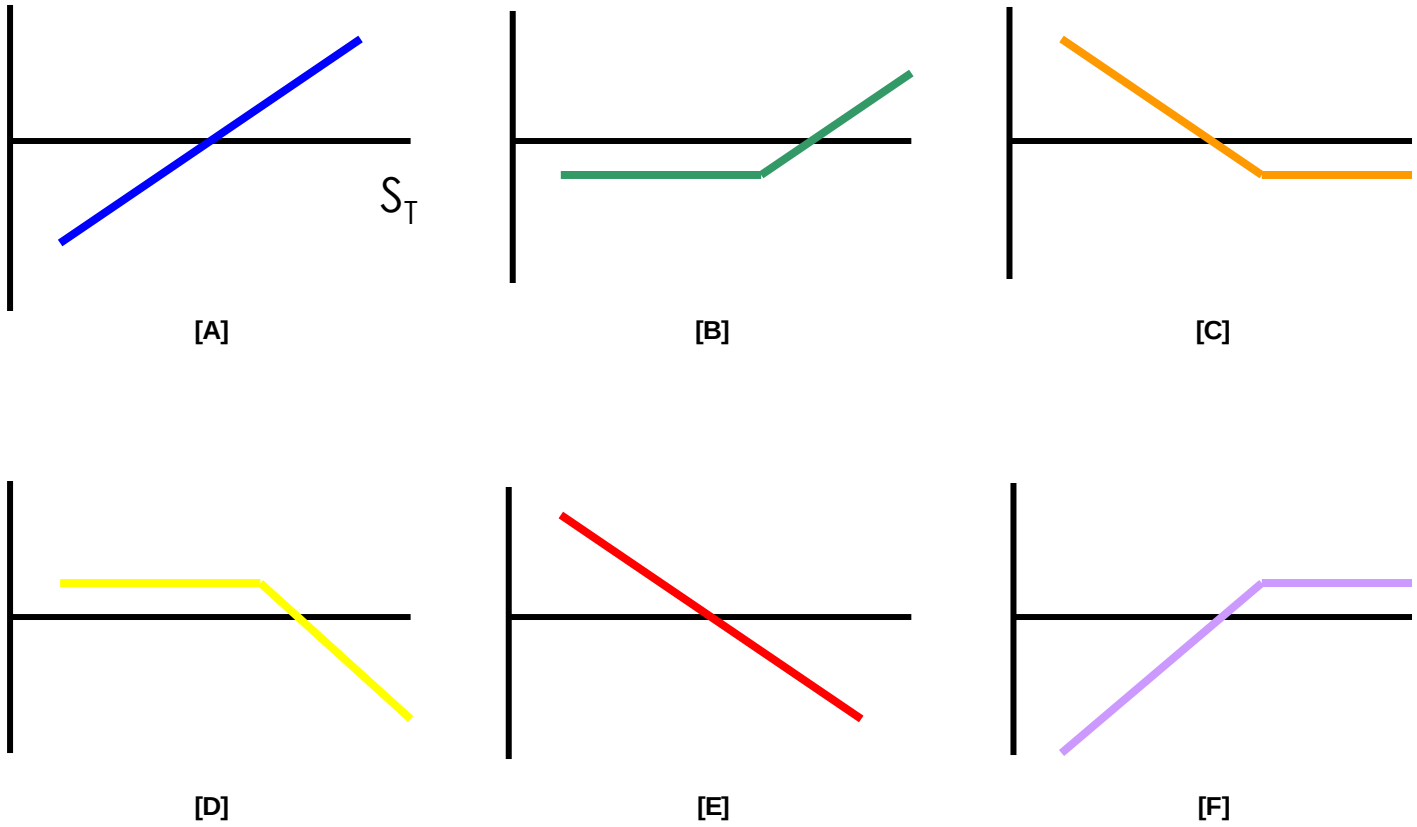
- $P = S_t - S_0$

- Payoff the comprar uma acção:
- $P = S_t - S_0$



Seis formas básicas de payoffs

Profit

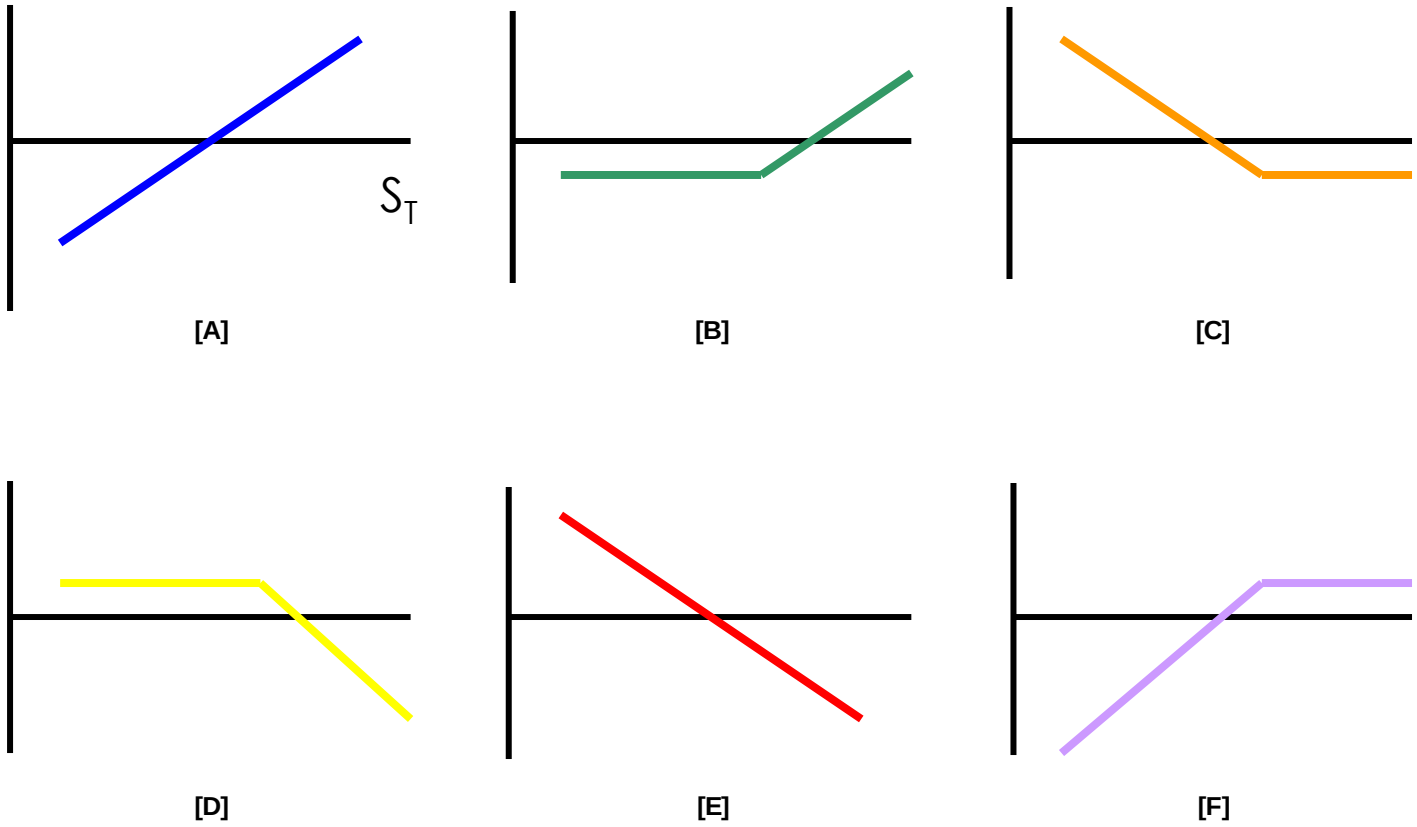


- Payoff de vender uma acção a descoberto:

- $P = S_0 - S_t$

Seis formas básicas de payoffs

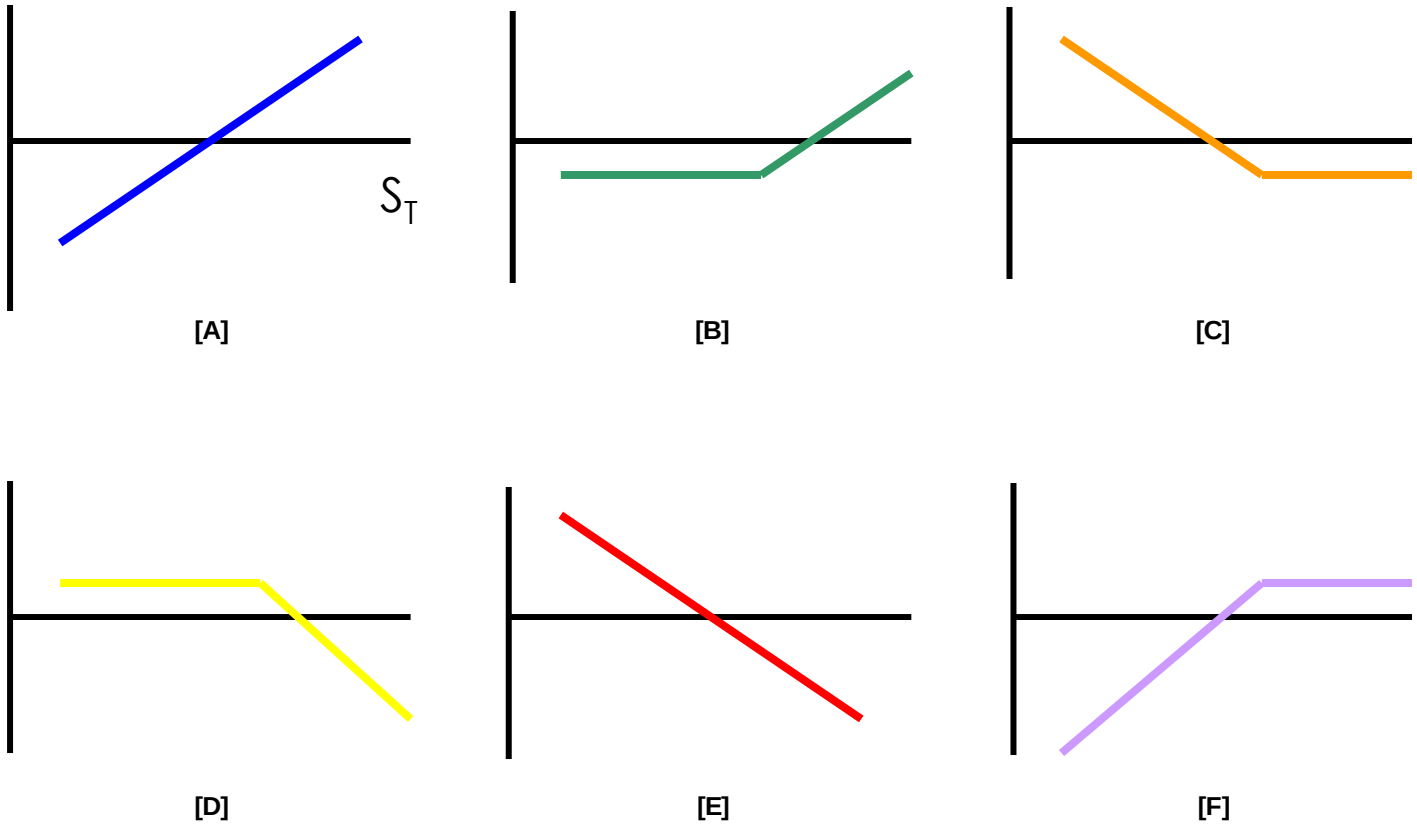
Profit



- Payoff de comprar uma opção de compra.
- $P = Max(S_t - S_E - p; -p)$
- Payoff de vender uma opção compra
- $P = Min(-S_t + S_E + p; p)$

Seis formas básicas de payoffs

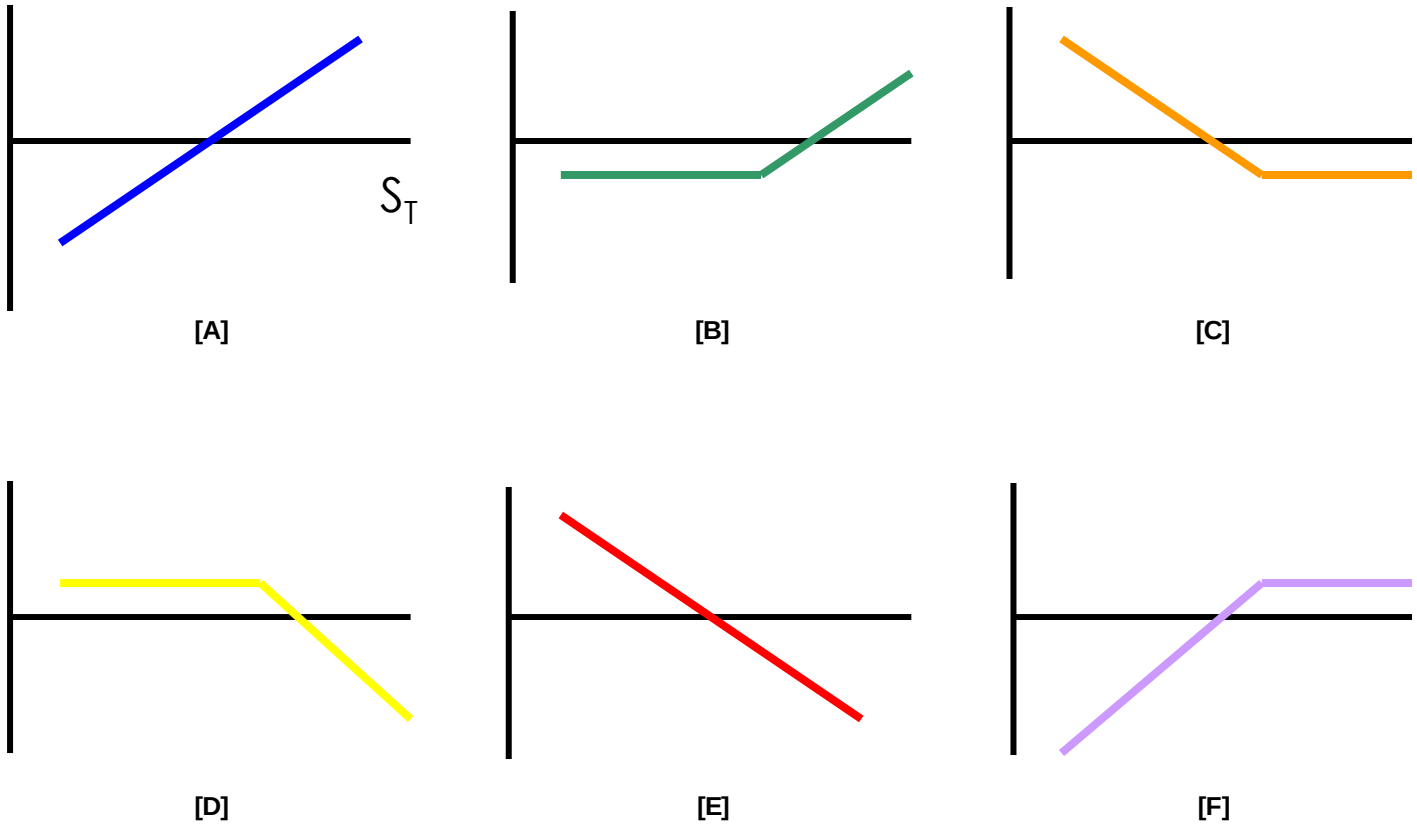
Profit



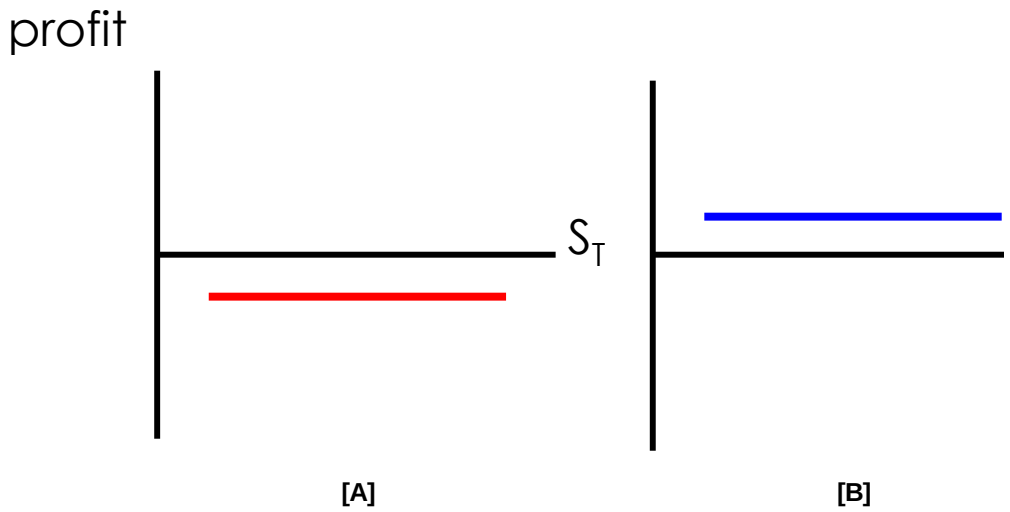
- Payoff de comprar uma opção de venda.
- $P = Max(S_E - S_t - p; -p)$
- Payoff the vender uma opção venda
- $P = Min(-S_E + S_t + p; p)$

Seis formas básicas de payoffs

Profit



Para além disso existem ainda duas posições chamadas sem risco por terem payoffs não dependentes do valor de St.

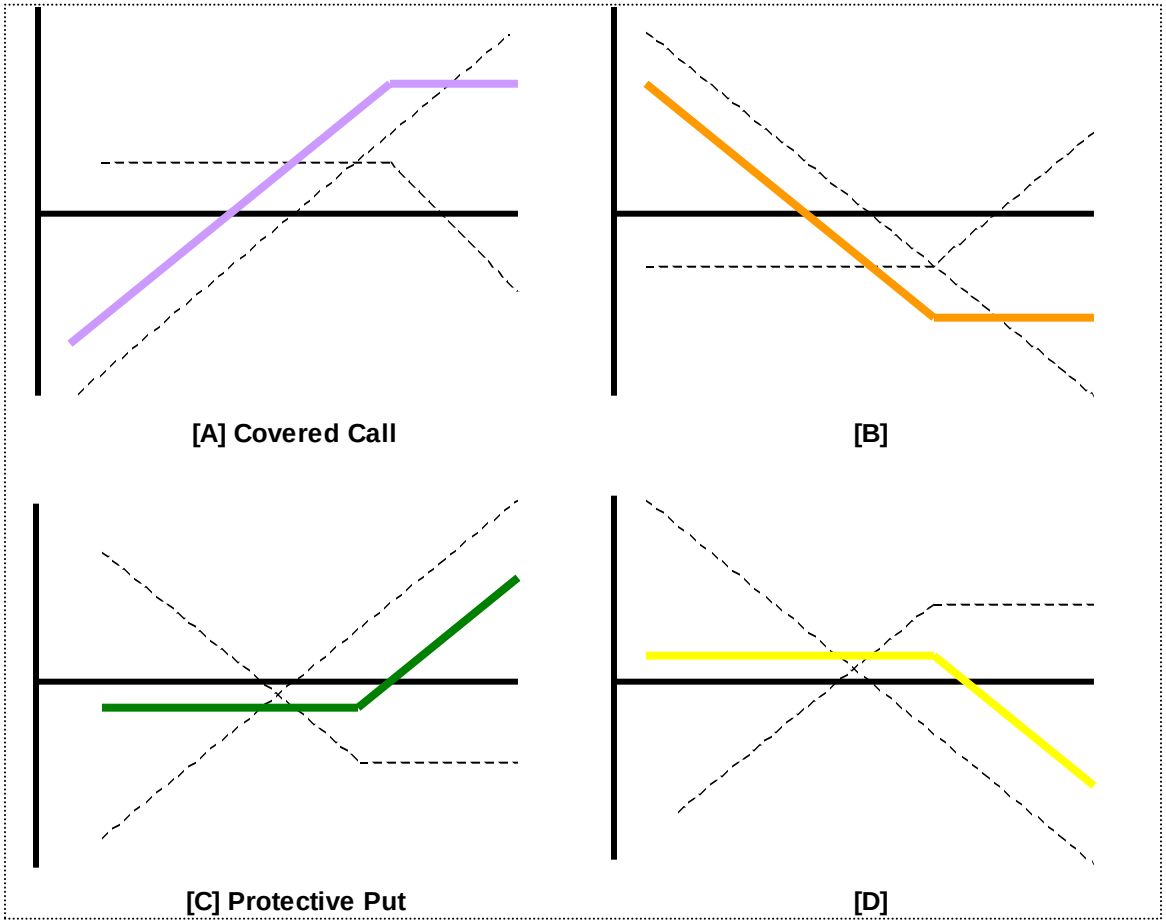


- As estratégias com opções vão fazer combinações com estes payoffs.

Basicamente, existem três grandes estratégias com opções:

- i) Assumir posições num tipo de opções e no ativo subjacente.
- ii) Assumir posições em opções do mesmo tipo, ou seja, só de compra ou só de venda (Spread strategy).
- iii) Assumir posiçõs em opções de tipo diferente, isto é de compra e venda (Combination strategy).

- i) Assumir posições num tipo de opções e no ativo subjacente.


[A] Covered Call
[B]
[C] Protective Put
[D]

- Suppose you current own 100 shares of a stock, with a value of $86.38/share.
- You fear it may fall in value in the short run, but do not want to sell now.
- You see the following option data:

Strike	Call	Put
75	11.50	0.75
80	7.00	1.38
85	4.25	3.25
90	2.25	6.13
95	0.81	8.88

- You decide to purchase an 85 put.
- The protective put strategy is long stock + long put.

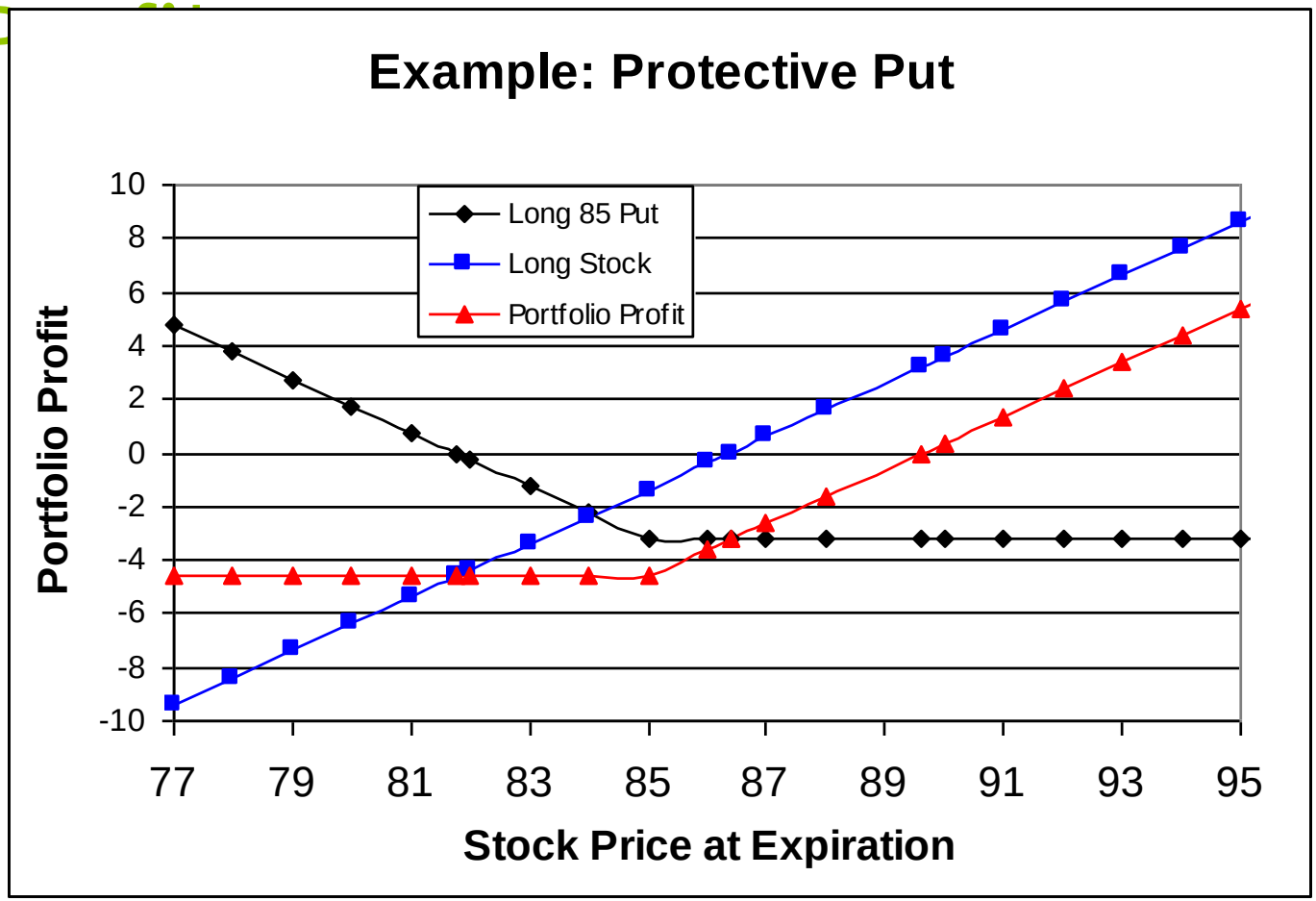
Example: Protective Put, II

- That is:

At time 0	
Buy stock	-86.38
Buy put	- 3.25
CF(0)	-89.63

Stock Price at Expiration	P(T) 85 Put	Sell stock	CF(T)	CF(0)	CF(0)+CF(T) Portfolio Profit
78.00	7.00	78.00	85.00	-89.63	(4.63)
79.00	6.00	79.00	85.00	-89.63	(4.63)
80.00	5.00	80.00	85.00	-89.63	(4.63)
81.00	4.00	81.00	85.00	-89.63	(4.63)
81.75	3.25	81.75	85.00	-89.63	(4.63)
82.00	3.00	82.00	85.00	-89.63	(4.63)
83.00	2.00	83.00	85.00	-89.63	(4.63)
84.00	1.00	84.00	85.00	-89.63	(4.63)
85.00	0.00	85.00	85.00	-89.63	(4.63)
86.00	0.00	86.00	86.00	-89.63	(3.63)
86.38	0.00	86.38	86.38	-89.63	(3.25)
87.00	0.00	87.00	87.00	-89.63	(2.63)
88.00	0.00	88.00	88.00	-89.63	(1.63)
89.25	0.00	89.25	89.25	-89.63	(0.38)
89.63	0.00	89.63	89.63	-89.63	0.00
90.00	0.00	90.00	90.00	-89.63	0.37
91.00	0.00	91.00	91.00	-89.63	1.37
92.00	0.00	92.00	92.00	-89.63	2.37

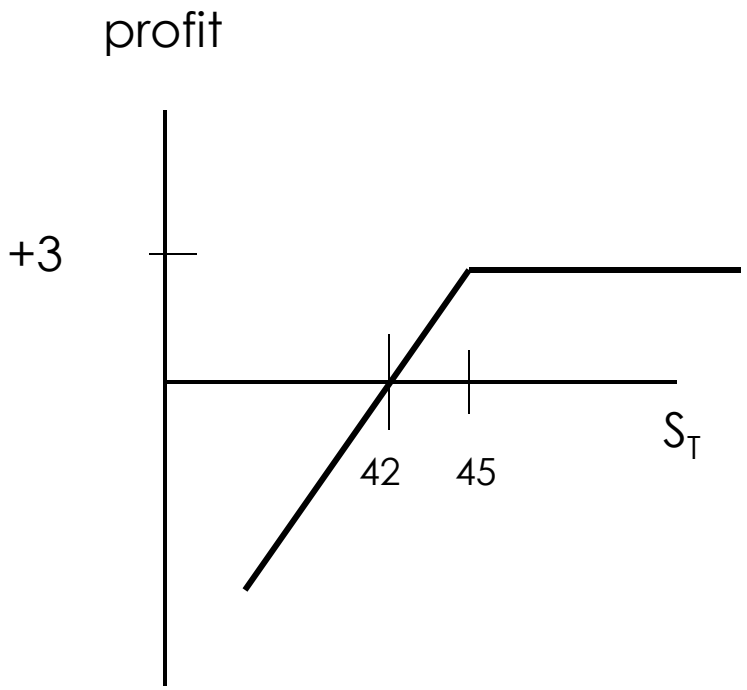
This is the range of S(T) that you really need


Example: Protective Put
Long 85 Put
Long Stock
Portfolio Profit
Portfolio Profit
10
8
6
4
2
0
-2
-4
-6
-8
-10
77
79
81
83
85
87
89
91
93
95
Stock Price at Expiration

Writing a covered call

- Buy a stock for S(0) = 43
- Sell a call with K = 45 for C(0) = 1
- Initial outlay is -42

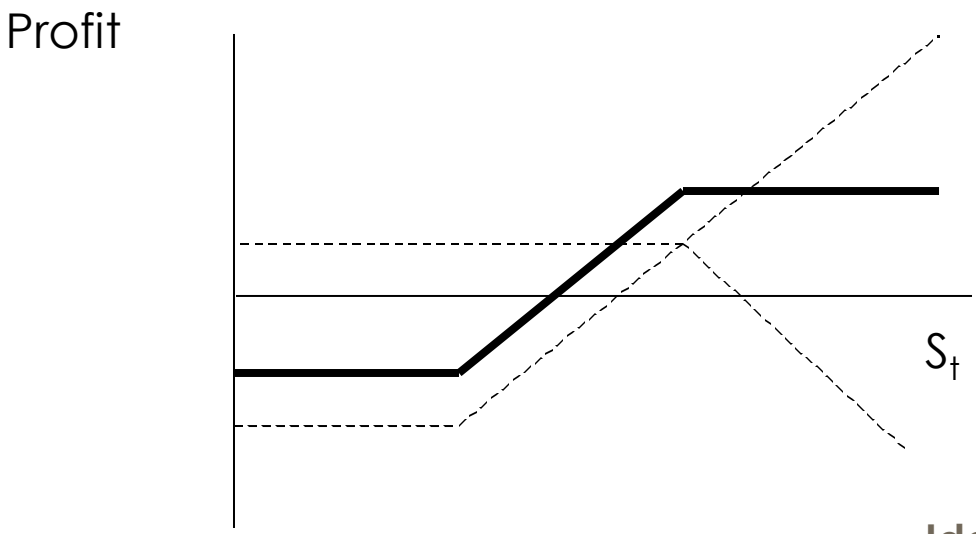
Stock Price at Expiration	offset C(T) 45 call	Sell stock	CF(T)	CF(0)	CF(0)+CF(T) Portfolio Profit
40.00	0.00	40.00	40.00	-42.00	(2.00)
41.00	0.00	41.00	41.00	-42.00	(1.00)
42.00	0.00	42.00	42.00	-42.00	0.00
43.00	0.00	43.00	43.00	-42.00	1.00
44.00	0.00	44.00	44.00	-42.00	2.00
45.00	0.00	45.00	45.00	-42.00	3.00
46.00	-1.00	46.00	45.00	-42.00	3.00
47.00	-2.00	47.00	45.00	-42.00	3.00
48.00	-3.00	48.00	45.00	-42.00	3.00



- ii) Assumir posições em opções do mesmo tipo, ou seja, só de compra ou só de venda (Spread strategy).

Vertical Spreads I,

- **[A] Bulish Vertical Spread with Calls (AKA: A Bull Call Spread, or Buy Call with lower strike.**
  - **Sell Call with higher strike.**



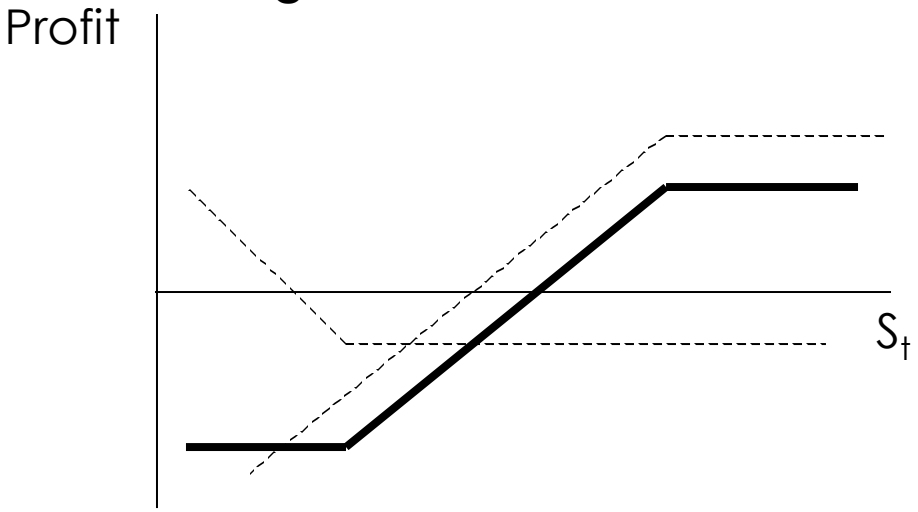
[A] Bull Call Spread

Note that there is an initial outlay with this strategy; the purchased call has a higher price than the written call

Identify the Strike Prices Using the 'kinks'

Vertical Spreads, II.

- [B] Bullish Vertical Spread with Puts (AKA: A Bull Put Spread.)
  - Buy Put with lower strike.
  - Sell Put with higher strike.



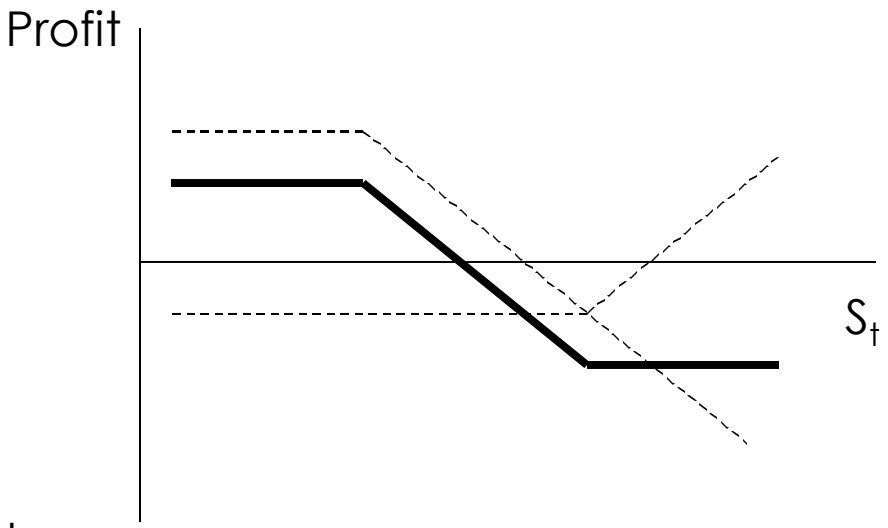
[B] Bull Put Spread

There is an initial cash inflow with this strategy.

Again: Identify the Strikes by the 'Kinks'. Do they make sense?

Vertical Spreads, III.

- **[C] Bearish Vertical Spread with Calls (AKA: A Bear Call Spread.)**
  - **Buy call with higher strike.**
  - **Sell call with lower strike.**



[C] Bear Call Spread

Is there an initial cash inflow or outflow?

Example: Bullish Vertical Spread with Calls, I.

- Suppose you observe the following data from the CBOE:
  - Price of Jan 80 Call: $3.75 ($375 per contract)
  - Price of Jan 75 Call: $5.00 ($500 per contract)
- You decide to buy the Jan 75 call and sell the Jan 80 Call.
- Today, your outlay is $1.25, or $125 per contract.
- At expiration:
  - At any price lower than $75, your payoff is $0 and your loss is $1.25 (your initial outlay).
  - If the underlying price is $76 at expiration, your payoff is $1.00, and your loss ($CF_0 + CF_T$) is $0.25.
  - If the underlying price is $77 at expiration, your payoff is $2.00, and your profit is $0.75.
  - If the underlying price is $79 at expiration, your payoff is $4.00, and your profit is $2.75.
  - At any price equal to or above $80, your payoff is $5.00, or $500, and your profit is 3.75.

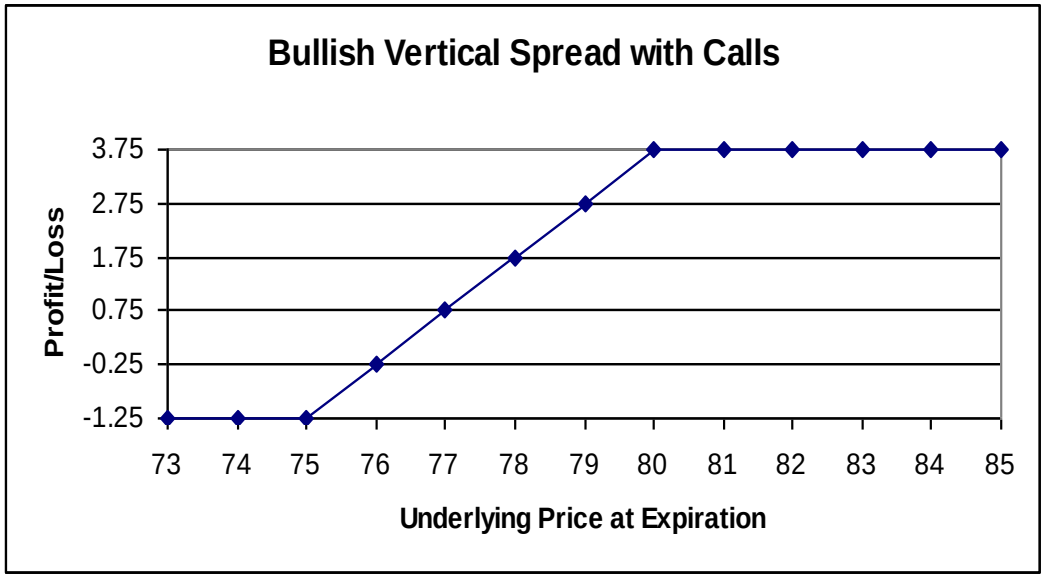
Example: Bullish Vertical Spread with Calls, II.

- Today: Buy Jan 75 call-5
  Sell Jan 80 call +3.75
  CF(0) -1.25

S_T	C(T) Offset 75 Call	C(T) offset 80 Call	CF(T)	Total Profit CF(0)+CF(T)
73	0.00	0.00	0.00	(1.25)
74	0.00	0.00	0.00	(1.25)
75	0.00	0.00	0.00	(1.25)
76	1.00	0.00	1.00	(0.25)
77	2.00	0.00	2.00	0.75
78	3.00	0.00	3.00	1.75
79	4.00	0.00	4.00	2.75
80	5.00	0.00	5.00	3.75
81	6.00	(1.00)	5.00	3.75
82	7.00	(2.00)	5.00	3.75
83	8.00	(3.00)	5.00	3.75
84	9.00	(4.00)	5.00	3.75
85	10.00	(5.00)	5.00	3.75

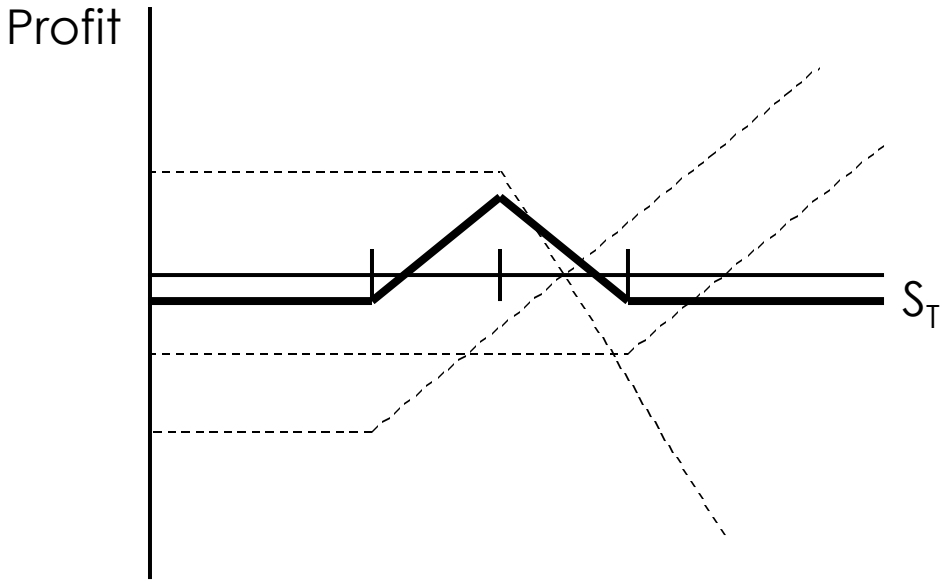
Example: Bullish Vertical Spread with Calls, III.

Then, one can plot the underlying price at expiration against the position profit or loss (note that the kinks are at the strike prices, 75 and 80): **(Obviously, one could plot each elementary position as well.)**



Butterfly Spread Using Calls

- **This is a Long Call Butterfly: With equally spaced strikes:**

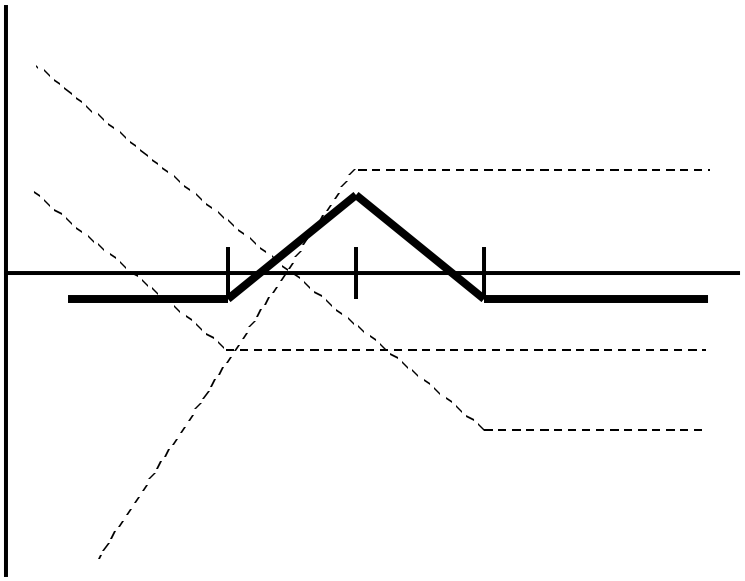


Long Butterfly Using Calls

Long 1 with lowest strike;
Short 2 with middle strike;
Long 1 with highest strike

Butterfly Spread Using Puts

- **This is a Long Put Butterfly: With equally spaced strikes:**



Long Butterfly Using Puts

Long 1 with lowest strike;
Short 2 with middle strike;
Long 1 with highest strike

What do you think a written butterfly would look like?

Other Spreads, I.

- Calendar Spreads:
  - Use the same strike, but with two different expiration dates.
  - Can use either calls or puts.
  - The resulting payoff is curved. This is because one option is still 'alive' at the expiration date of the other.

- Ratio Spreads
- Can use either calls or puts.
  - Same expiration, but with two different strikes.
  - **However,** unlike other spreads, the number of options held in each position is not the same. For example, a one could buy 3 puts with a strike of 30, and sell one put with a strike of 35.

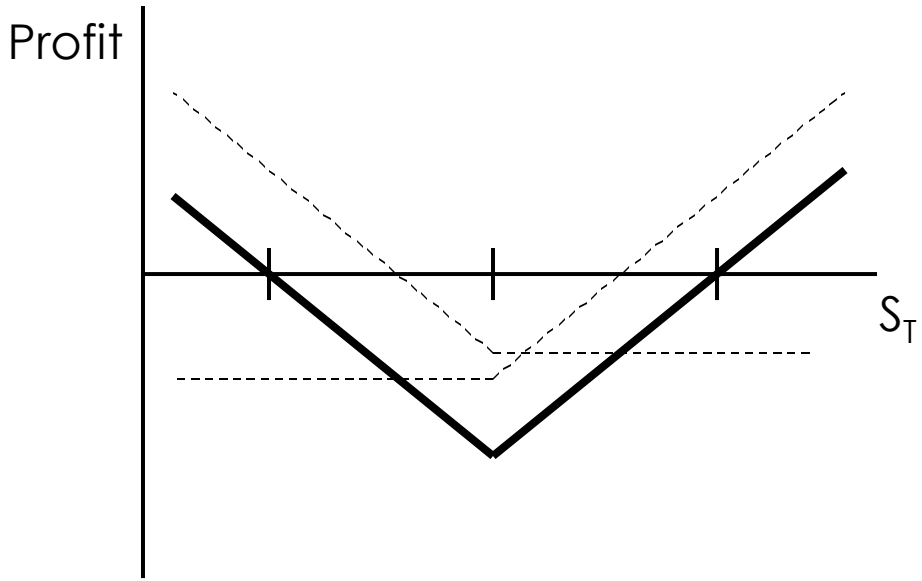
Other Spreads, II.

- Condor Spread.
  - Uses four, equally spaced strikes.
  - For a long condor spread: Long 1 at the lowest and 1 at the highest strike; short 1 at both intervening strikes.
  - The resulting payoff resembles a butterfly spread, but with a 'flat spot' between the middle two strikes. (The payoff for a long butterfly resembles a 'witches' hat; the payoff for a long condor resembles a 'stovepipe' hat.)

- iii) Assumir posiçõs em opções de tipo diferente, isto é de compra e venda (Combination strategy).

Combinations, I.

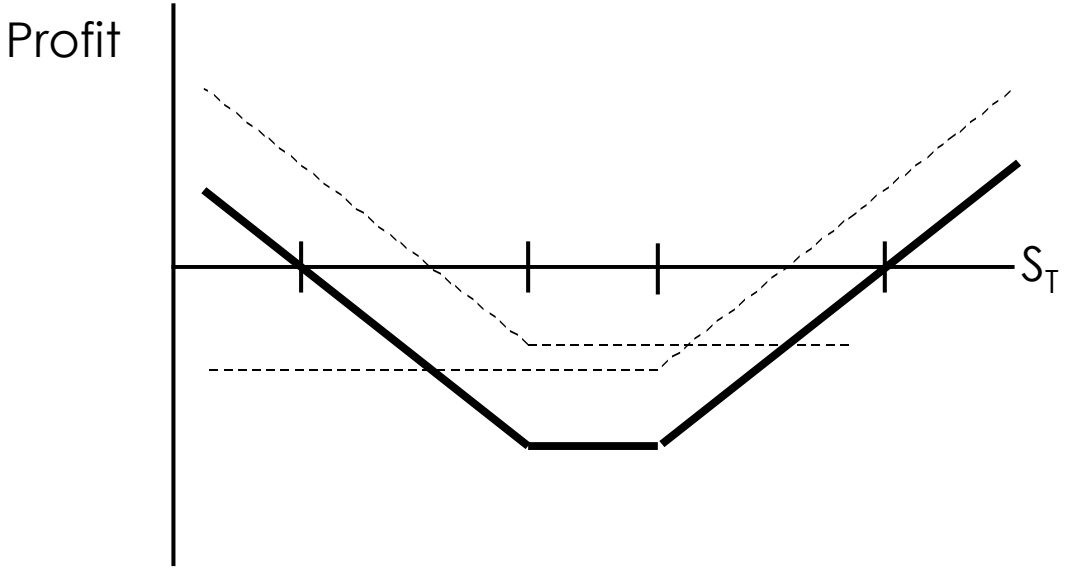
- A Long **Straddle** is formed by a long call and a long put:
  - Both have the same strike and expiration date.
  - What is the **worst** possible value for the underlying at expiration?
  - In a Short Straddle, one sells the call and sells the put.



Long Straddle Using a Call and a Put

Combinations, II.

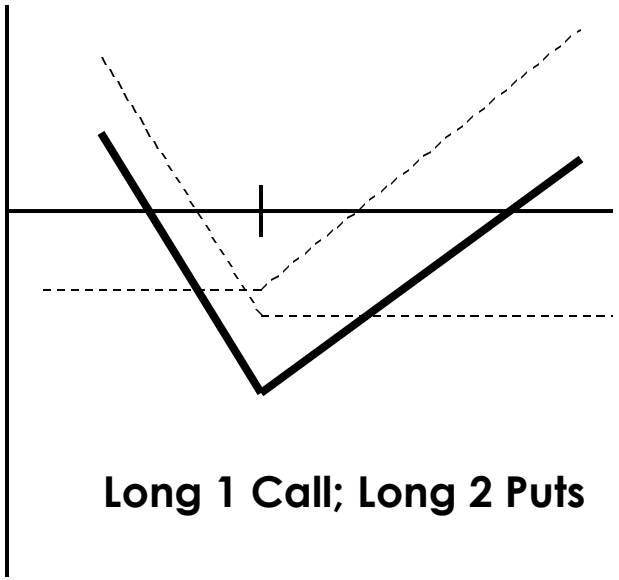
- A Long **Strangle** is formed by a long call and a long put:
  - Both have the same expiration date.
  - But, the call and put have different strike prices.
  - In a Short Strangle, one sells the call and sells the put. (what does it look like?)



Long Strangle Using a Call and a Put

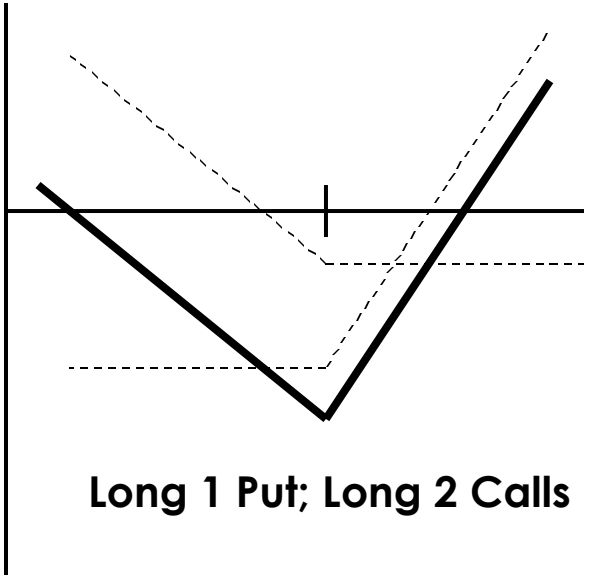
Combinations, III. Strips and Straps

- Strips and straps are formed by using a different number of calls and puts. However, all the options share
  - The same strike price.
  - The same expiration date.



Long 1 Call; Long 2 Puts

[A] Long Strip



Long 1 Put; Long 2 Calls

[B] Long Strap

What are the slopes of these lines?

Example: Long 85 Straddle

- You see the following option data and decide to purchase an 85 call and an 85 put.

Strike	Call	Put
75	11.50	0.75
80	7.00	1.38
85	4.25	3.25
90	2.25	6.13
95	0.81	8.88

- Using the steps to build a profit table, you construct the following table.

Long 85 Straddle, II.

Time 0

Buy C (K=85) -4.25

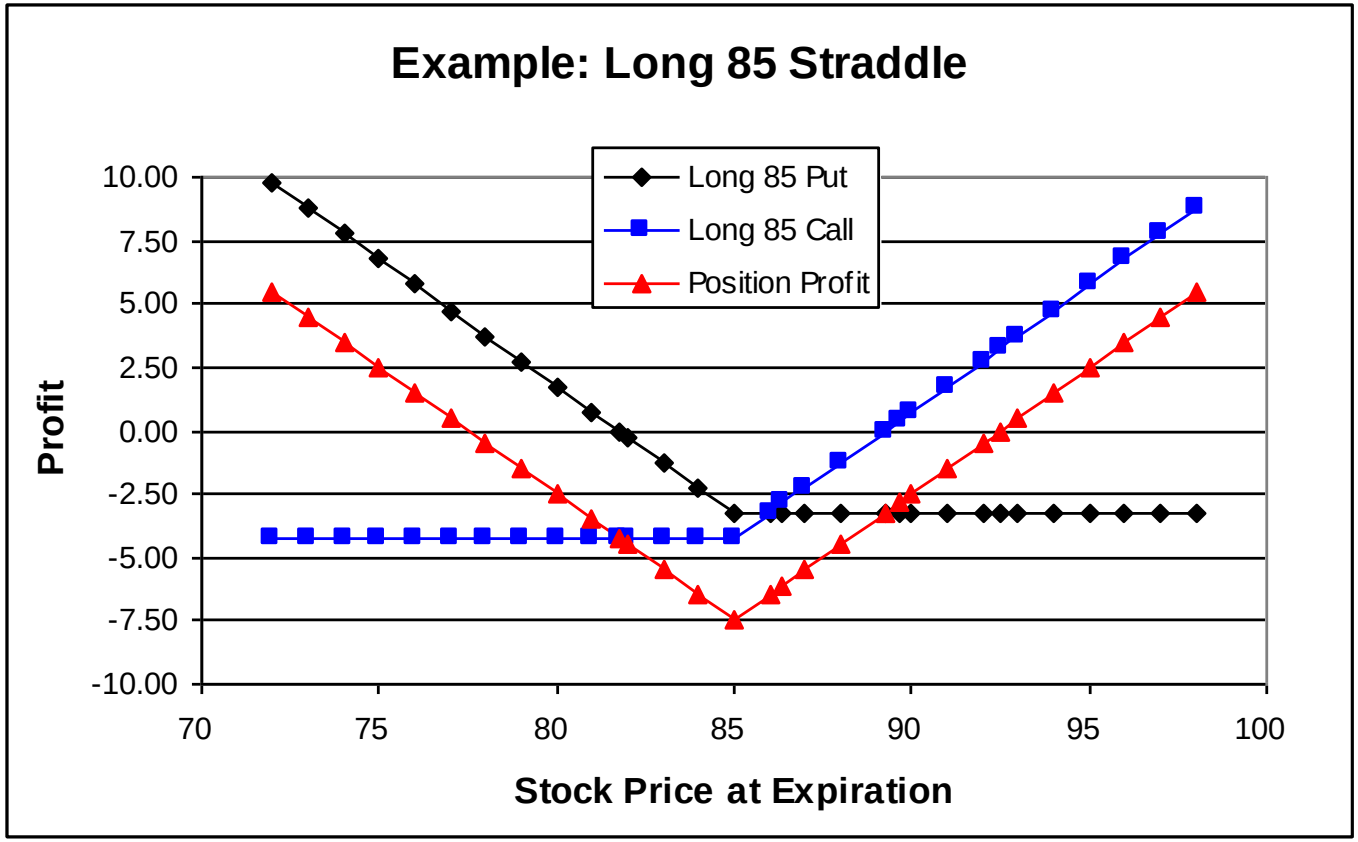
Buy P (K=85) -3.25

CF(0) -7.50

Stock Price at Expiration	Offset P(T) 85 Put	Offset C(T) 85 Call	CF(T)	CF(0)	Portfolio Profit
75.00	10.00	0.00	10.00	(7.50)	2.50
76.00	9.00	0.00	9.00	(7.50)	1.50
77.00	8.00	0.00	8.00	(7.50)	0.50
78.00	7.00	0.00	7.00	(7.50)	(0.50)
79.00	6.00	0.00	6.00	(7.50)	(1.50)
80.00	5.00	0.00	5.00	(7.50)	(2.50)
81.00	4.00	0.00	4.00	(7.50)	(3.50)
81.75	3.25	0.00	3.25	(7.50)	(4.25)
82.00	3.00	0.00	3.00	(7.50)	(4.50)
83.00	2.00	0.00	2.00	(7.50)	(5.50)
84.00	1.00	0.00	1.00	(7.50)	(6.50)
85.00	0.00	0.00	0.00	(7.50)	(7.50)
86.00	0.00	1.00	1.00	(7.50)	(6.50)
86.38	0.00	1.38	1.38	(7.50)	(6.12)
87.00	0.00	2.00	2.00	(7.50)	(5.50)
88.00	0.00	3.00	3.00	(7.50)	(4.50)
89.25	0.00	4.25	4.25	(7.50)	(3.25)
89.63	0.00	4.63	4.63	(7.50)	(2.87)
90.00	0.00	5.00	5.00	(7.50)	(2.50)
91.00	0.00	6.00	6.00	(7.50)	(1.50)
92.00	0.00	7.00	7.00	(7.50)	(0.50)
92.50	0.00	7.50	7.50	(7.50)	0.00
93.00	0.00	8.00	8.00	(7.50)	0.50
94.00	0.00	9.00	9.00	(7.50)	1.50
95.00	0.00	10.00	10.00	(7.50)	2.50

Long 85 Straddle, III.

Then, one can plot the profit data:



- Exemplo de mais uma fonte de informação financeira.

- http://money.msn.com/investing/