Options Strategies and Applications

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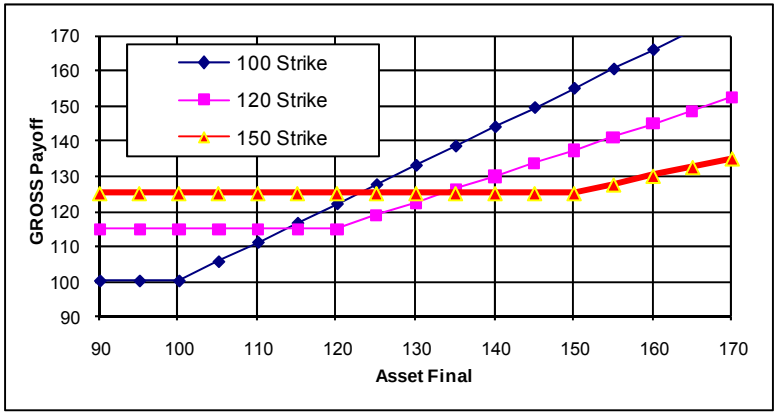


First…..Let's take a step back

1) What are markets?
2) What is finance?
3) What are financial markets?
4) Where are the jobs?

Markets
Ownership and "fair" trade

1) Two parties each own an asset or represent the owner of an asset.
2) The parties meet in some marketplace.
3) Each party values the other party's asset more than they value their own asset.
4) A "fair" trade occurs.
5) Wealth is created (or at least each party feels wealthier than they had before).

Finance
It's all about capital and time

1) Capital represents a "fair" trade between savers (or their representatives) and entrepreneurs.
2) Entrepreneurs are any person(s) attempting to improve the human condition more efficiently than currently.
3) Capital "pre pays" for labor, land and materials. It bridges time and builds wealth.

Financial Markets
NOT INTENDED AS CASINO

1) Banks and Investment banks had gone “hog wild” with product creation, leverage and “gambling-like” trading.
2) “Asset Based” (inflation dependent) lending served as foundation for growth.
3) Hedge funds and other “off balance sheet” structures were granted greater leverage, compounding risk.
4) Wages couldn’t and didn’t keep up. Collapse.

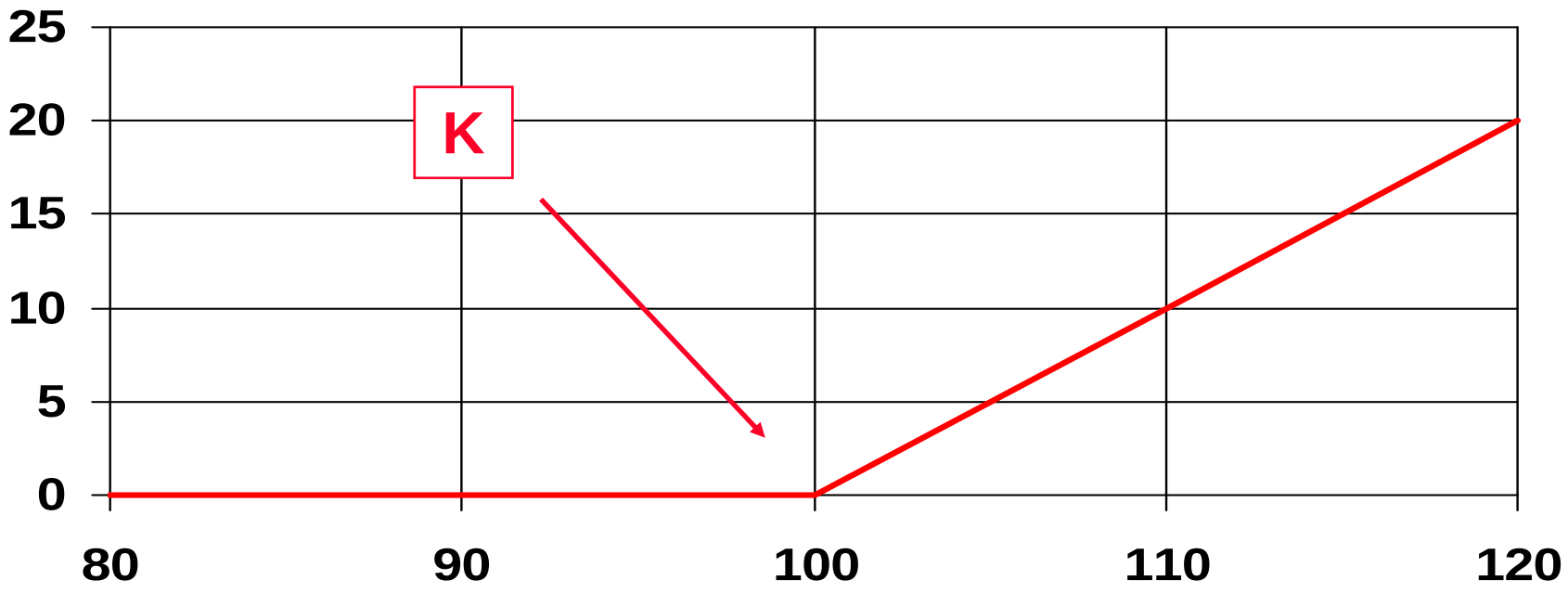
Financial Markets
Options strategies abound

1) An option trade is a “fair” trade between two parties (assuming both have a model!).
2) An option trade grants one party the right to a second trade that is not a “fair” trade.
3) One party, the option buyer, owns the right to buy an asset at a price lower than the “fair” market price (for a “call” option, a “put” is the right to sell).

Call :

The right , but not the obligation, to BUY a certain quantity of an asset, at a certain price, on or before a certain date.

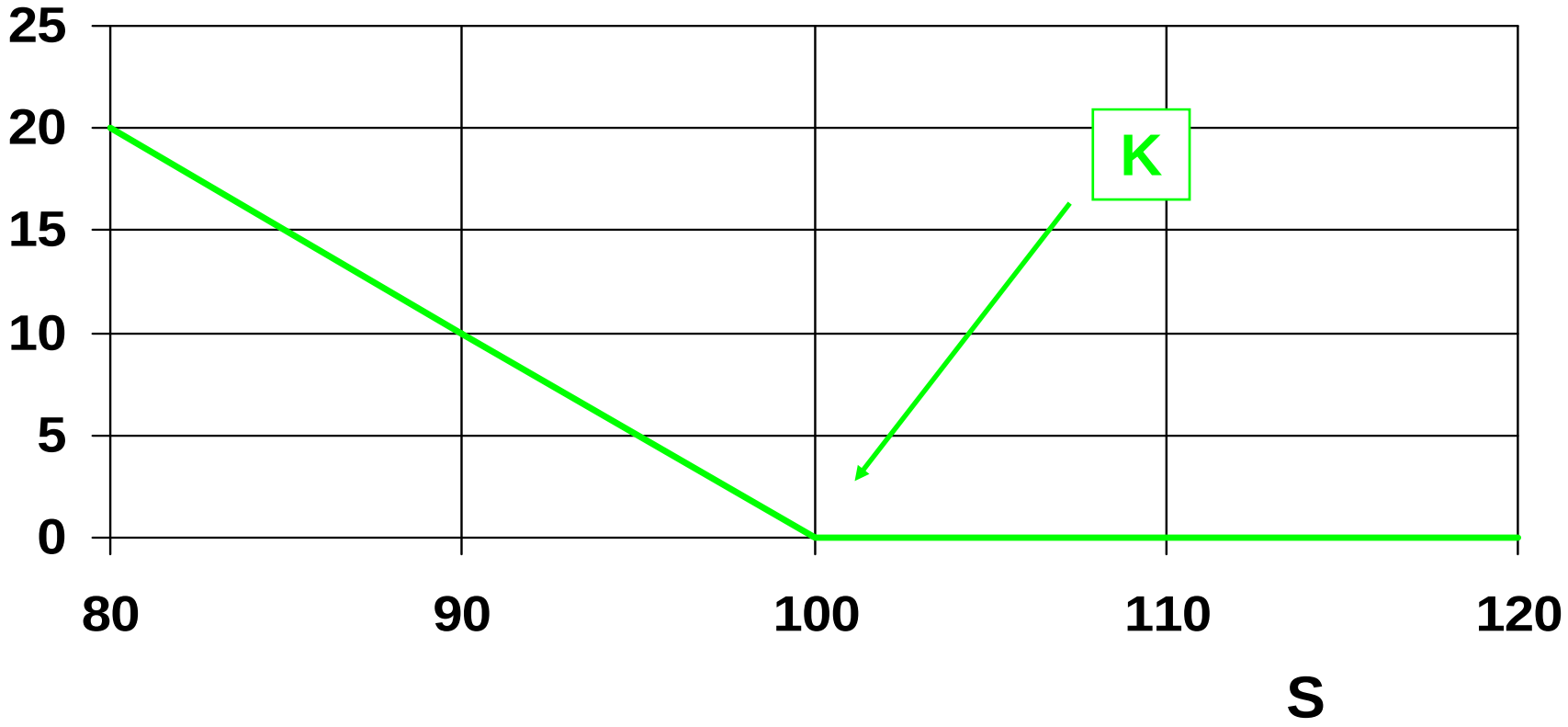
Value at maturity = Max [S - K , 0]



Put :

The right, but not the obligation, to SELL a certain quantity of an asset, at a certain price, on or before a certain date.

Value at maturity = Max [K - S , 0]



“IN THE MONEY”

Call : The market price S is above the strike price K.
Put : The market price S is below the strike price K.

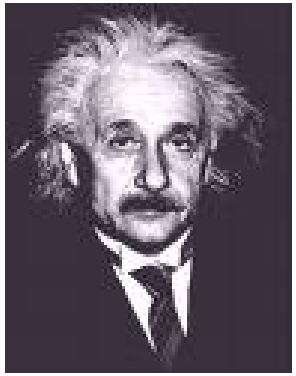
“AT THE MONEY”

S is at “or near” K [subjective].

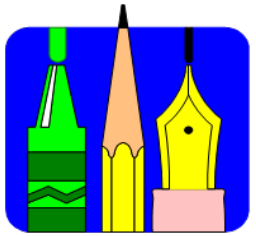
“OUT OF THE MONEY”

Call : S is below K.
Put : S is above K.

The PV of the expected pay-off



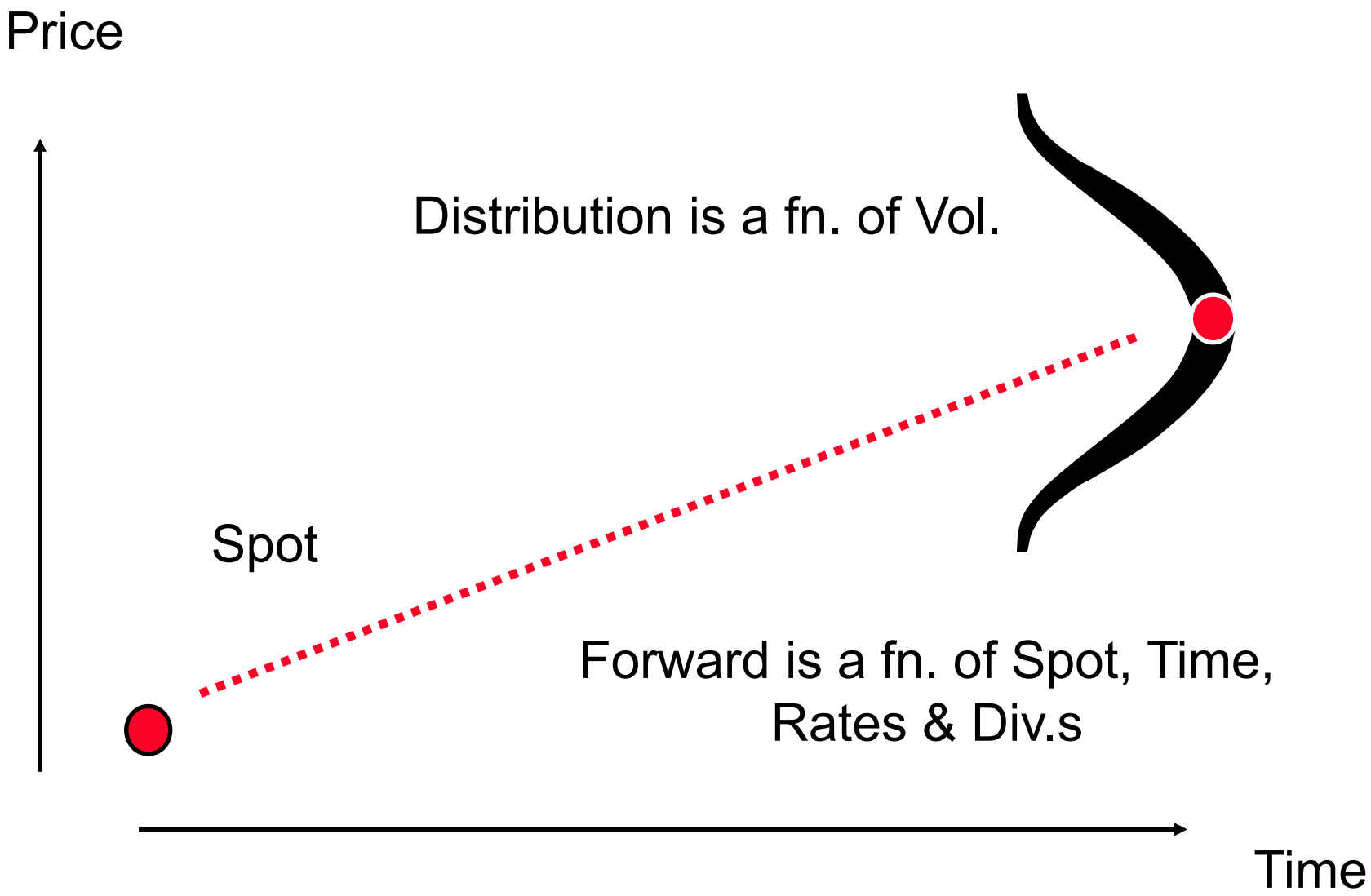
Option Inputs

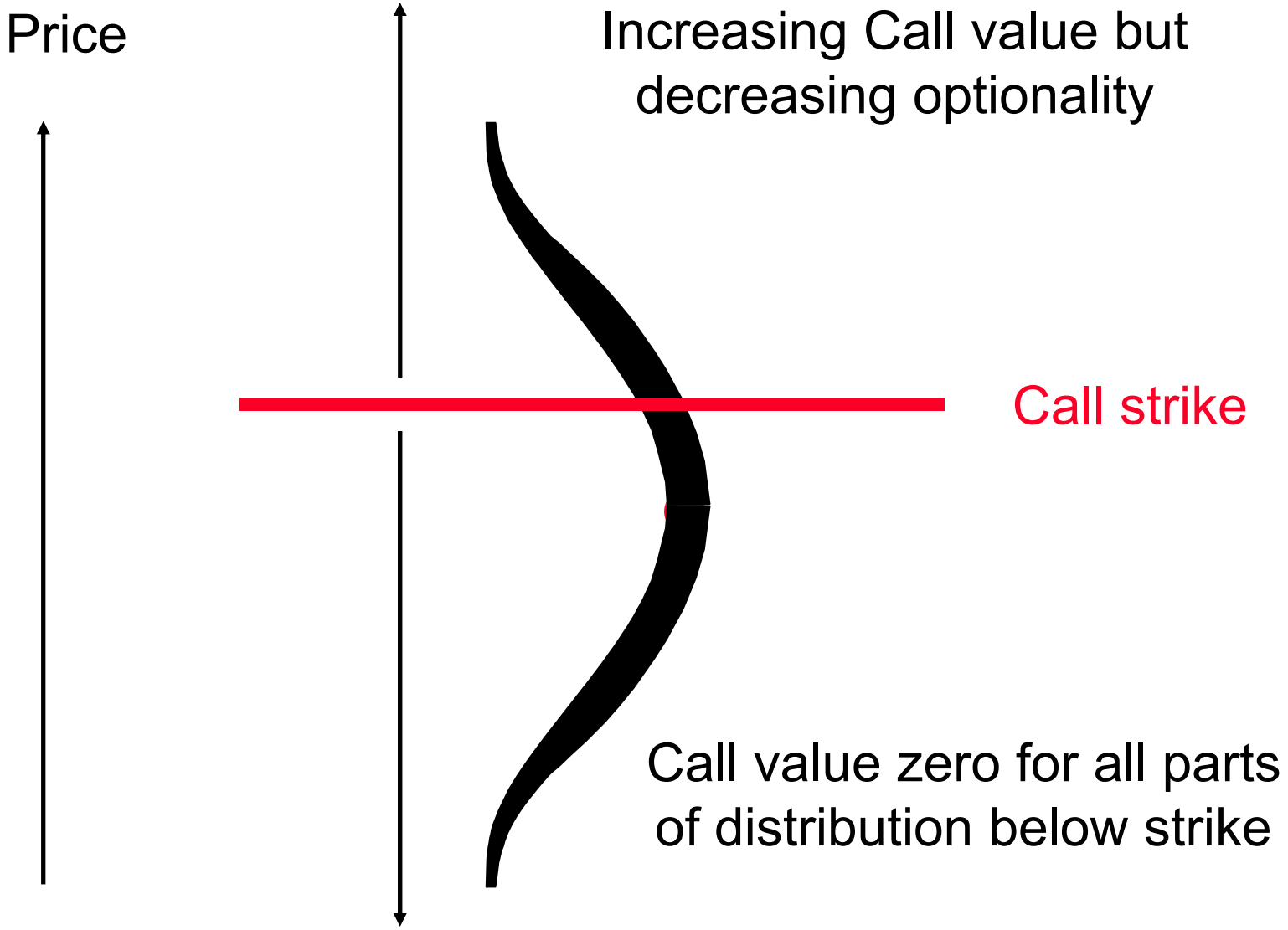


6 factors affect the value of an option :

Spot	=	S
Strike	=	K
Volatility	=	σ
Time to maturity	=	T
Interest rate	=	I
Dividend	=	d

Forward price / distribution




Price
Increasing Call value but
decreasing optionality
Call strike
Call value zero for all parts
of distribution below strike

The Black – Scholes Formula

1973

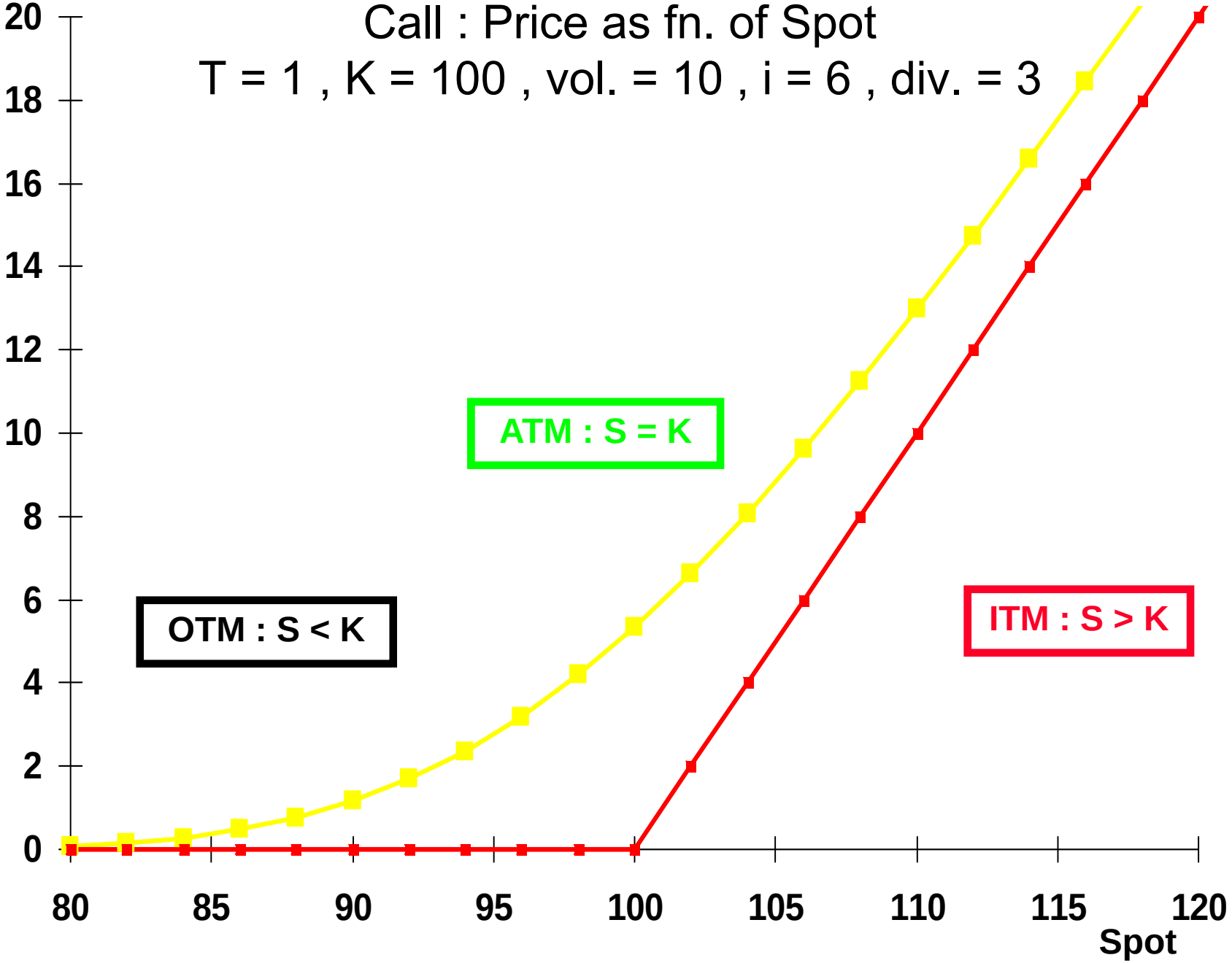
Black Scholes Formula (call):

$$c = S\,N(d_1) - K\,e^{-iT}\,N(d_2)$$

- N(x) is the cumulative probability distribution function for a standardized normal variable, i.e. the probability that the variable will be < x
- d_1 and d_2 are functions of all the option inputs
- N(d1) is the “delta” of the option.
- The formula essentially PVs the expected pay-off.

Black - Scholes Assumptions

- European option (exercisable only at maturity).
- Asset prices are log normally distributed.
- Asset is tradable freely in whole or partial units.
- Can short the asset and invest proceeds at risk free interest rate.
- Can lend and borrow at the riskless rate, which accrues continuously.
- Riskless rate & asset volatility constant.
- No taxes, transaction costs or margins.
- No jumps or discontinuities in asset price.

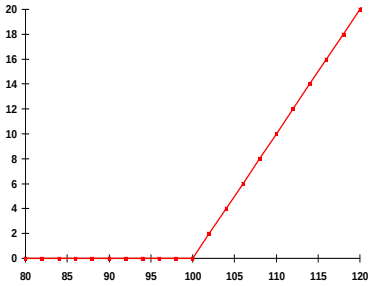

Call : Price as fn. of Spot
T = 1 , K = 100 , vol. = 10 , i = 6 , div. = 3
20
18
16
14
12
10
8
6
4
2
0
80
85
90
95
100
105
110
115
120
Spot
ATM : S = K
OTM : S < K
ITM : S > K

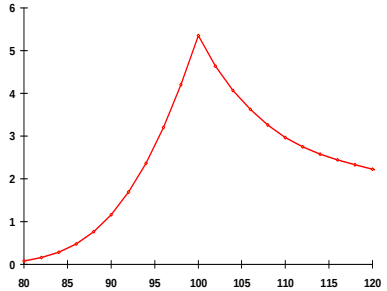
The option price at any time consists of

INTRINSIC VALUE

and

TIME VALUE.



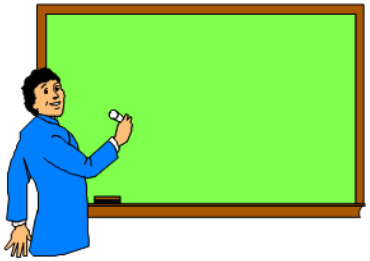


Time / Intrinsic Value

- At maturity the yellow option value curve lies on the straight, red “hockey stick”.

- The option no longer has any TIME VALUE , but consists only of INTRINSIC VALUE.

Option Strategies



A] Tailoring investment payoff profiles:

You want positive exposure to an asset - IBM

1) Buy IBM:

Spot	=	100
Target Sale Date	=	15-Jan-2010
Expected Price	=	110
Return on Inv.	=	[110 / 100] - 1 = 10%

But what of the RISK?

What of 70, 80, 90 outcomes for IBM?
What if your expected price is too optimistic?

2) Buy a Call Option on IBM instead:

Spot	=	100
Strike	=	100
Volatility	=	28%
Maturity	=	15-Jan-2010
Interest rate	=	1.2%
Dividend	=	2.2%
Price	=	$ 9.70

If at maturity IBM has risen 10 % to $ 110, the option pays off

Max [S - K , 0] = $ 10.00

Profit is [Payoff / Premium] - 1

Profit = [$10.00 / $ 9.70] - 1 = 3.1%

Better than owning IBM below $90.30
But below 100, 100% loss of Premium
Below 110, loss of some Premium in payoff

3) Buy a Call Spread on IBM instead

Spot	=	100
Strike 1	=	100
Strike 2	=	110
Volatility	=	28%
Maturity	=	15-Jan-2010
Interest rate	=	1.2%
Dividend	=	2.2%
Price 1	=	$ 9.70
Price 2	=	$ 6.00

If at maturity IBM has risen 10 % to $ 110, the option pays off

Max [Min(110,S) - K , 0] = $ 10.00

Profit is [Payoff / Premium] - 1

Profit = [$10.00 / ($ 9.70 - $6.00)] - 1 = 270%

Better than owning IBM below $96.30
But below 100, 100% Loss of Premium
And above 110, no additional payout

The possible return profiles which can be created using multiple calls and puts is infinite.

Many of the exotic structures (binary payoff, “cliquet” options, compound options) can be created using the basic call and put pricing and payoff structure.

Leverage is introduced with options, and leverage can be a dangerous thing.

B] Trading the volatility:

You believe that IBM will be volatile, and want to win in a volatile environment:

1) Buy 100 share Straddle on IBM:

Spot	=	100
Strike	=	100
Volatility	=	28%
Maturity	=	15-Jan-2010
Interest rate	=	1.2%
Dividend	=	2.2%
Forward Price	=	$ 99.22
Price	=	$ 1,940
Initial “delta”	=	+7.50%

Why is “delta” positive if Spot = Strike > Forward?

Answer:
Lognormal Distribution puts odds of being above the forward higher than being below the forward (above 100 to infinity…..below 100 to 0).

The strikes equating to Delta = 0?
Strikes = $ 102.5

Conclusion: Options are complicated!

B] Extracting Volatility Value:

24-Mar-09:
IBM = $100/share
Delta = + 7.50%
Short 7.5 shares at $100/share.

15-Apr-09 Assume:
IBM = $88/share
Delta = - 34%
Buy 7.5 shares at $ 88/share
Profit on hedge = 7.5 * (100 – 88) = $ 90.
New hedge buy 34 shares at $ 88/share

B] Extracting Volatility Value cont'd:

15-Jul-09 Assume:

IBM = $115/share

Delta = + 56.0%

Sell 34.0 shares at $ 115/share

Profit on hedge = 34.0 * (115 – 88) = $ 918.00

New hedge sell 56.0 shares at $ 115/share

15-Oct-09 Assume:

IBM = $94/share

Delta = - 30.0%

Buy 56.0 shares at $ 94/share

Profit on hedge = 56.0 * (115 – 94) = $ 1,176.00

New hedge buy 30.0 shares at $ 94/share

B] Extracting Volatility Value cont'd:

15-Jan-10 Expiry Assume:

IBM = $100/share

Delta = + 0.0%

Sell 30.0 shares at $ 100/share

Profit on hedge = 30.0 * (100 – 94) = $ 180.00

Total cashflow from "delta hedging":

$ (90.00 + 918.00 + 1,176.00 + 180.00)

Total (0% reinvestment for simplicity): $ 2,364.00

Initial Investment: $ 1,940.00

Profit = $ 424

Return on Prem = [2,364/1,940] – 1 = 21.86%

If less volatility, less delta hedging, less profit.

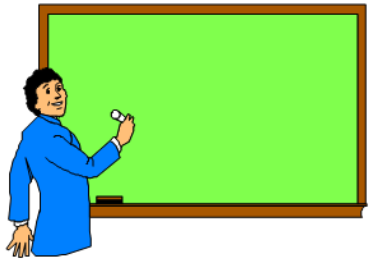
Volatility traders trade volatility:

Most of the options business is about volatility trading. Trades on implied volatility, expected volatility, trading the delta.

Shorter dated options: "gamma" trading (trading delta as shown in example).

Longer dated options: "vega" trading (much less trading underlying asset, more trading options in the implied volatility alone).

Options
Applications

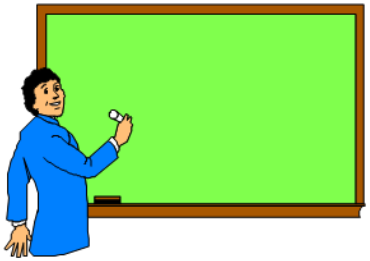


Options are present in many decisions:

A farmer can plant either wheat or corn in a part of his field this year. He owns that "option". He can look at financial options and futures on wheat and corn to decide what the market would pay to help him make his choice. "Risk Reversals"

Two job opportunities are presented to you. One pays $25,000 less, but gives upside with share participation and has a promising product pipeline. What is the value of working for less but with possible equity? Upside/stability/your % participation in shares are all factors.

Where
Are the Jobs?



Where are the Jobs?:

The 2000's were bizarre but high paying years on Wall Street and in Real Estate. That is over. Most people disliked what they were doing, but the money was too good to leave.

You should be thankful you missed it.

A nation drifted away from its moorings. There is still disarray in the wake of it. But this gives you a chance to find what you really want to do with your careers.

Where are the Jobs?:

Read the financial papers and read books, especially read about history.

Ask questions and spend time with teachers, mentors and friends discussing what's going on in economies and markets.

Always look to option theory to help in making decisions.

Websites / Media:

CNBC (but remember, it is an “infomercial”)
Comedy Central (John Stewart)
www.wsj.com
www.ft.com
www.elliottwave.com
www.dowtheoryletters.com
www.financialsense.com
www.moneyandmarkets.com
www.safehaven.com
www.mises.org

Reading List:

Essays on the Great Depression – Ben Bernanke
America's Great Depression – Murray Rothbard
The Roosevelt Myth – John T. Flynn
The Bubble that Broke the World – Garet Garrett
Tragedy & Hope – Carroll Quigley
The Intelligent Investor – Benjamin Graham
Conquer the Crash – Robert Prechter
The Panic of 1907 – Robert Bruner
The Fourth Turning – William Strauss
A History of Money and Banking
in the United States – Murray Rothbard
Dying of Money – Jens O. Parsson