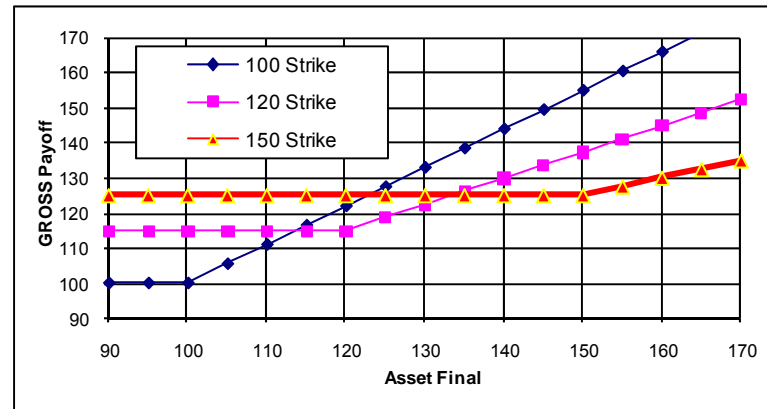


Options Strategies and Applications

Chris Tormey



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

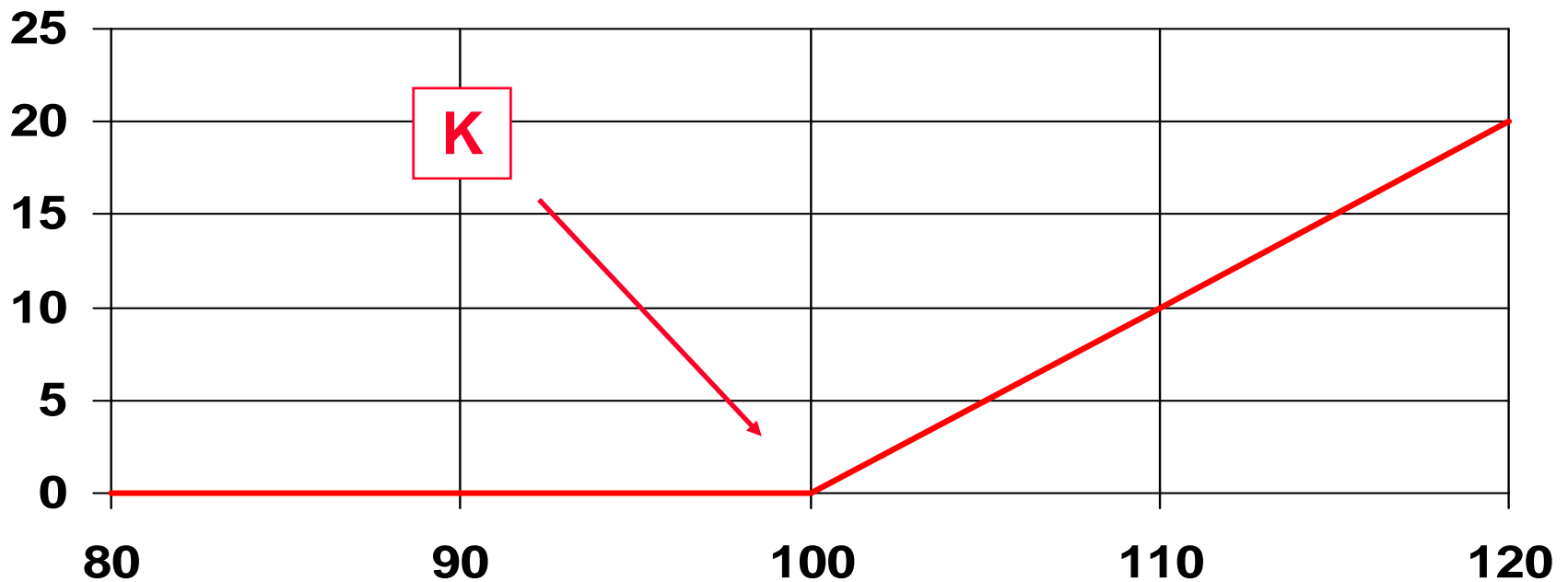
Options strategies abound

- 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.

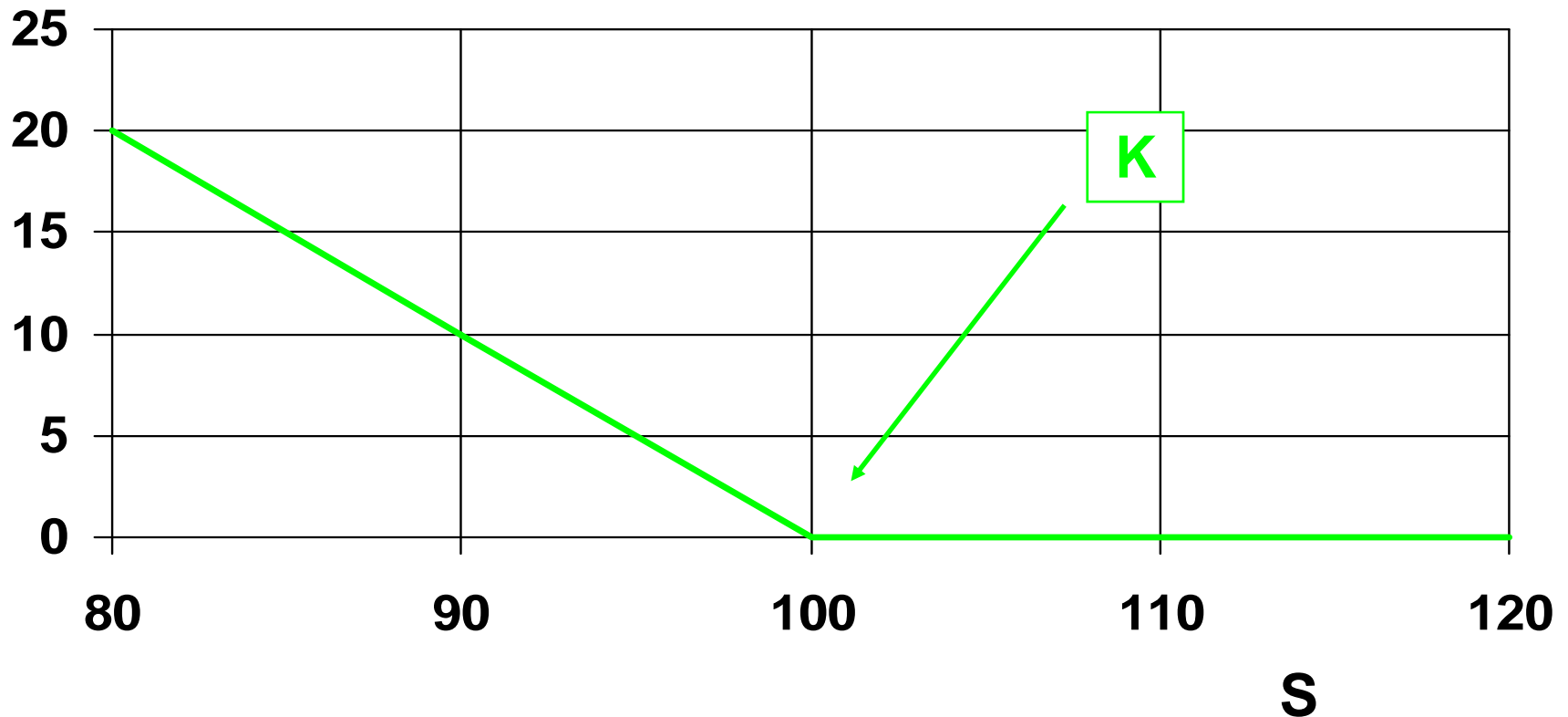
$$\text{Value at maturity} = \text{Max} [S - K , 0]$$



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.

$$\text{Value at maturity} = \text{Max} [K - S , 0]$$



“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”

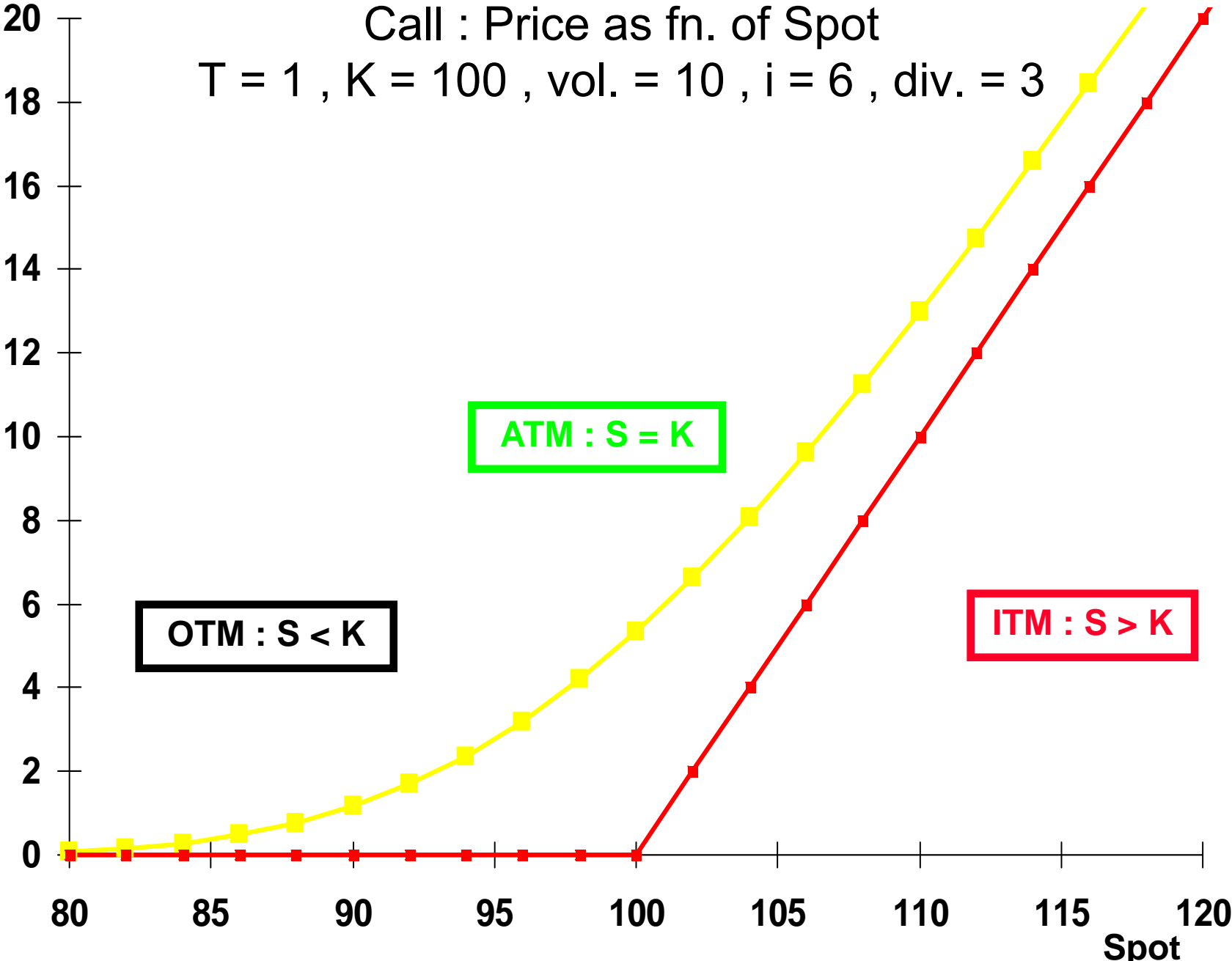
S is at “or near” K [subjective].

“OUT OF THE MONEY”

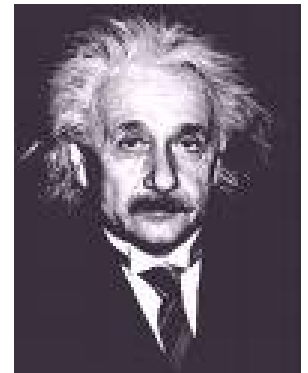
Call : S is below K .

Put : S is above K .

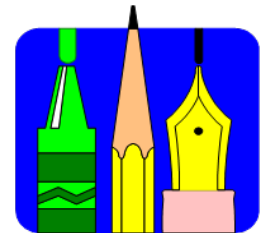
Call : Price as fn. of Spot
 $T = 1$, $K = 100$, $\text{vol.} = 10$, $i = 6$, $\text{div.} = 3$



The PV
of the
expected pay-off



Option Inputs

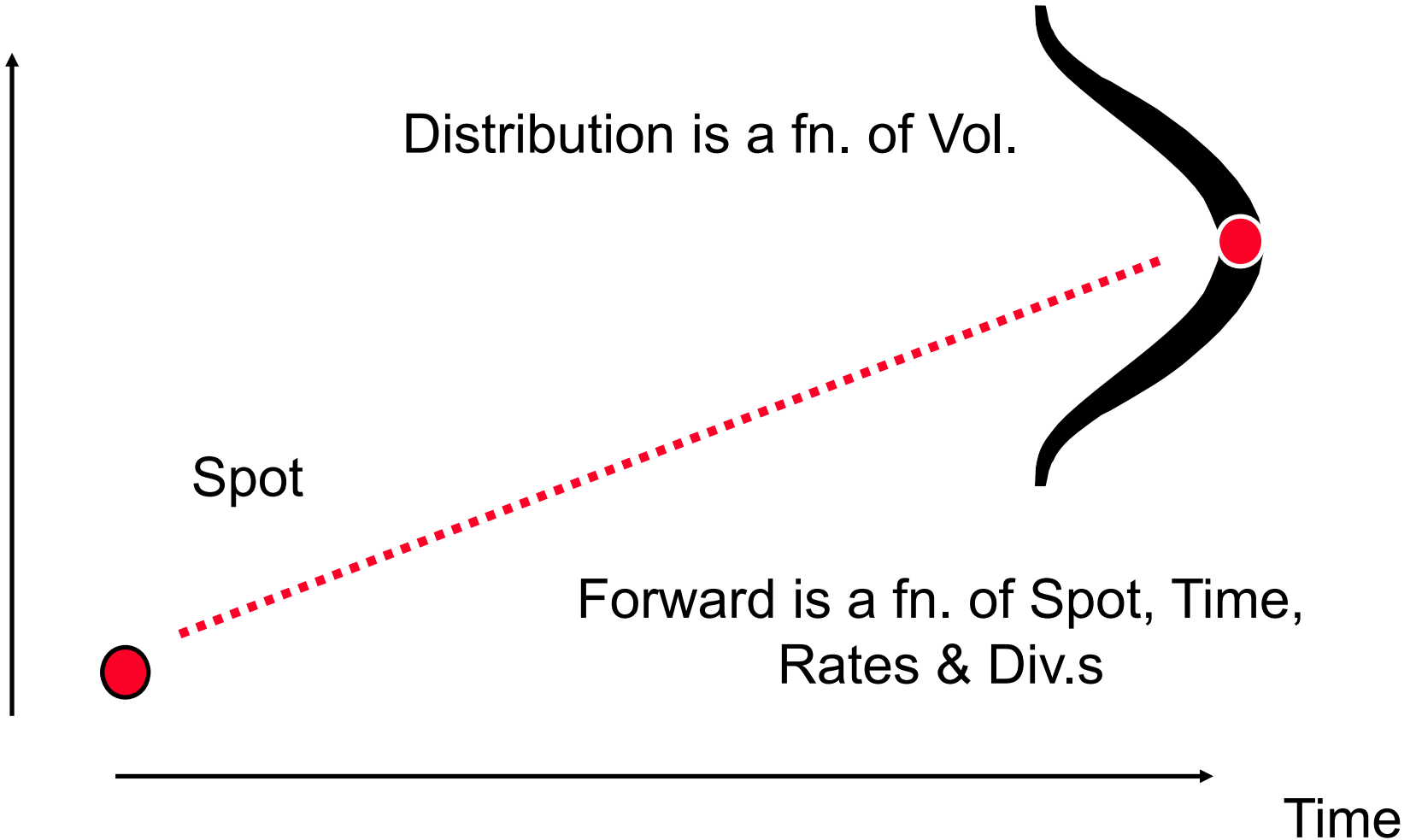


6 factors affect the value of an option :

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

Forward price / distribution

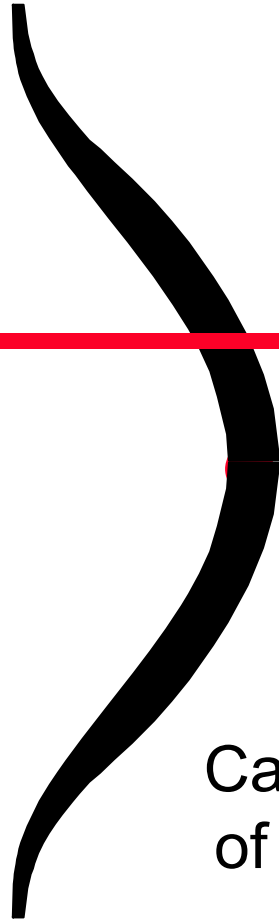
Price



Price



Increasing Call value but
decreasing probability



Call strike

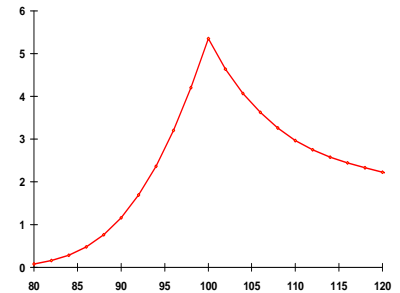
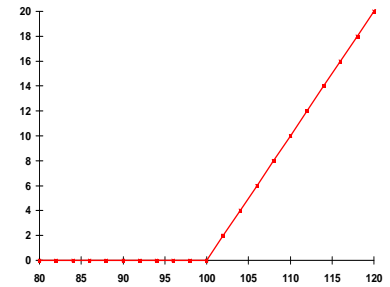
Call value zero for all parts
of distribution below strike

The option price at any time consists of

INTRINSIC VALUE

and

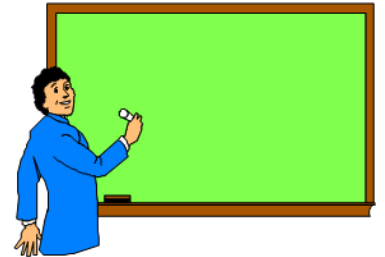
TIME VALUE.



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

$$\text{Max} [S - K , 0] = \underline{\$ 10.00}$$

Profit is [Payoff / Premium] - 1

$$\text{Profit} = [\$10.00 / \$ 9.70] - 1 = 3.1\%$$

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

$$\text{Max} [\text{Min}(110, S) - K , 0] = \underline{\$ 10.00}$$

Profit is [Payoff / Premium] - 1

$$\text{Profit} = [\$10.00 / (\$ 9.70 - \$6.00)] - 1 = 270\%$$

Better than owning IBM below \$96.30

But below 100, 100% Loss of Premium

And above 110, no additional payout

The possible return profiles using Calls and Puts is infinite. Can also create many of the exotic structures (binary payoff, “cliquet” options, compound options) after understanding 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.

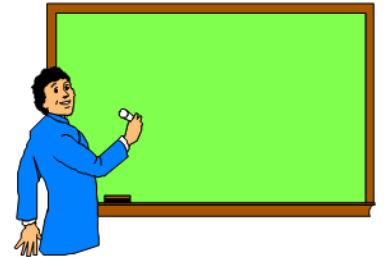
Volatility traders trade volatility:

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 delta trading, more trading on changes in the implied volatility alone).

Options Applications

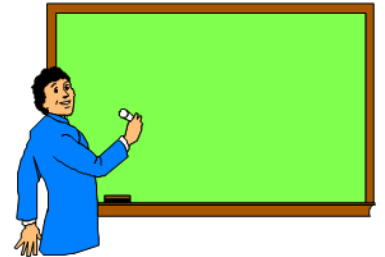


Options are present in almost all decisions:

A farmer can plant either wheat or corn in a part of his field this year. He owns that “option”. He can look at options and forwards on wheat and corn one year hence to decide what the market would pay to help him make his choice.

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?:

Do what you like to do (but “watching TV” is not “doing” anything).

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

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

Always look to option theory in making your decisions.