Understanding Financial Derivatives

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Background & Introduction

"Derivatives are weapons of mass destruction." - Warren Buffett

"The most obvious (cause of The Financial Crisis of 2008) is the financiers themselves—especially the irrationally exuberant Anglo-Saxon sort, who claimed to have found a way to banish risk when in fact they had simply lost track of it." *The origins of the financial crisis*

Crash course, The Economist, 7/9/2013.

Derivatives actually started as financial instruments to ***mitigate risk***. Over the years, the tail started wagging the dog & what was a tool for risk-reduction, become a powerful method of multiplying gains, with the natural downside of immense risk & destruction not just of capital, but of entire systems….what we often term *systemic risk*

Of course, there are several reasons for risk building up in economies and markets, but despite reams of research and billions of dollars invested in exotic, complex, risk-management systems, each time there is a crisis, it becomes apparent that ***financial derivatives are not fully understood, nor are their unfolding implications, amenable to quantification, especially when markets are volatile***.

It is my humble attempt to simplify the basics of Financial Derivatives, with a request that readers treat this as a first step, an elementary guide, to whet your appetite for further, detailed study.

A word of caution: Human beings do not fully understand risk. (my opinion)

Let us consider an example: **It is raining heavily. If I go for a walk, there is a 5% chance that I will slip, fall & break my leg. Most of us would happily accept this risk & say, "Oh, that's fine, then. Only 5% chance of damage".**

God forbid, if I do fall & break my leg, will I break it 5%, or will I break it 100%?

It is imperative for us to understand not just a probability and an expected risk/return, but also, our ability to face this risk, should the worst happen.

Hence, derivatives ….therefore, the need to literally, *look before we leap!*

What is a Financial Derivative?

It is a financial instrument,

Which derives its value from the underlying asset.

e.g. a forward contract on gold, is the derivative instrument, while gold is the actual, underlying asset

The price of the derivative contract will be closely linked to the price & changes in price, of the underlying asset, in this case, gold.

However, the underlying could also be a random event, or a state of nature (like weather)

In fact, exotic, complex, hybrid & customized derivatives, while being instrumental in growth & protection, have often had terrible consequences, when unchecked for sense & sensibility.

The Net Supply of the Derivative Instrument is ZERO.
The supply of the Underlying, or Fundamental Asset, is a reality.

e.g. If there is a future contract on the exchange, on Reliance Industries

There can only be a derivative contract in existence, if there is a buyer and a seller, and both consent to the price, executing the trade. Every single contract that exists, has both, a buyer and a seller. If both close their positions, then the net derivative position becomes ZERO.

Contrast this with the actual underlying asset, in this case, shares of Reliance Industries.

The company has issued equity shares and the total outstanding equity is Rs. 3,238 crore (media release, Reliance Industries Ltd, 16th October, 2015)

This translates into a total of 323. 8 crore equity shares of Rs. 10/ each, fully paid-up

These shares exist, even if no fresh buyers or sellers transact. In other words, the market cannot change the outstanding equity base of Reliance Industries, no matter how many trades there are.

The market can increase or decrease the quantity of derivatives contracts outstanding, depending on number of trades.

<u>What are the underlying assets?</u>

Most common

Stocks
Bonds
Commodities
Currencies
Interest Rates

<u>Which are the Common Financial Derivatives?</u>

Forwards
Futures
Options
Swaps

We shall briefly cover all these in this paper, but the discerning reader will no doubt have a big question in mind.

WHY DERIVATIVES?

<u>Scenario 1</u>

Consider a farmer, whose fresh crop of corn will be harvested in three months from now. He is unsure about the price he will receive at that time. Will he get a buyer when he is in the market to sell corn, three months later? Uncertain again.

A derivative contract will enable him to enter into a firm contract today, to sell a fixed quantity of corn, of an agreed upon quality, at a mutually agreed price, at the time specified (in his case, three months).

Lo presto, the farmer now knows how much demand there is for his corn for delivery after three months (when he is ready with his harvest) and he also knows what price he will receive for his produce. <u>Uncertainty removed</u>

<u>Scenario 2</u>

An IT company will receive its payment in US$, a month later. It is unsure about the rupee value of this receipt, at that time.

Derivatives can enable this company to sell the receivables in US$ today, to lock into the prevailing US$/INR rate for one month

Once again, the company has mitigated uncertainty. It has an assured buyer for the revenue flow in US$, more importantly, it is assured of an exchange rate today, to enable sound planning.

<u>Scenario 3</u>

A long-term investor has a blue chip portfolio, which she is unwilling to liquidate. She does feel that the market may fall in the near future, thus affecting her investments, negatively.

She can use derivatives today, sell now and buy later, amount linked to her portfolio value, to take advantage of any fall in market values, while at the same time, retaining her portfolio to continue participating in all corporate benefits therefrom

There are infinite possibilities, for buying or selling (sometimes, a combination of both) using derivatives to hedge risk

<u>Financial Derivatives are Used For:</u>

<u>Speculation:</u> **A speculator is one who bets on a price movement, in her/his favor. In effect, speculators use derivatives as a tool of LEVERAGE to enhance returns (or to lose more money, if they are proved wrong!)**

<u>Arbitrage:</u> **An arbitrageur takes advantage of a price differential in two markets, for the same asset, at the same time. Essentially, she/he makes a (theoretically) riskless profit by buying the asset in the market with a lower price, while simultaneously selling it in the market with a higher price.**

<u>Hedging:</u> **(Not to be confused with gardens) A hedger either owns the asset, or the right to the asset; or she/he is a consumer of the asset, or a prospective**

consumer of the asset. Hedgers use F&O (futures & options) markets to reduce their risk. (A perfect hedge would be one which eliminates risk, entirely)

Having covered the basics, let us now venture into the types of derivatives

<u>FORWARD CONTRACT</u>

A forward contract is

* **a contract between two parties**
* **either on a one-on-one basis, or transacted on an OTC (Over-The Counter) Exchange**
* **binding on both parties**
* **completed with one buyer and one seller**
* **specific in terms of, the price of the underlying to be exchanged, the quality/type of the underlying, the date of delivery, the quantity, and where applicable, the place and mode of delivery**
* **<u>a customized contract wherein both parties to the contract must be *consensus ad idem*</u>**

e.g. if "A" agrees to purchase 100 kg of wheat from "B" at Rs. 40/ per kg, after 6 months, it is a forward contract.
Note that the quality, specifications, delivery terms are all clearly specified in the contract)

"A" is assured of a buyer of 100 kg, @ 40/ per kg, 6 months from now
"B" is assured of supply of 100 kg, @ 40/ per kg, 6 months from now

<u>Win-Win situation, right? Uh, oh…..THERE IS COUNTER- PARTY RISK IN FORWARD CONTRACTS</u>

Counter-party risk is the risk of default by one of the parties to the contract. This may not be mala fide, but it happens. One person's gain is another person's loss. When the price of wheat becomes 55/ then "A" has every incentive to default on a contract to deliver at 40/. The reverse would hold true, if the price of wheat crashed to 25/…in which case, "B" would be better off, not honoring the forward contract, but rather, purchasing the required quantity in the spot market. With the best of intentions also, it is possible that one party is not able to fulfill her/his commitment as per the forward contract.

<u>FUTURES CONTRACT</u>

A futures contract is:

* **a contract between two parties**
* **executed thru a stock exchange**
* **binding on both parties (even though neither has inkling about the identity of the other)**
* **tantamount to the stock exchange being a counter-party to both, buyer & seller**
* **theoretically, free from counter-party risk (by a process known as** *NOVATION,* **the stock exchange becomes the buyer for the seller, and the seller for the buyer**
* **standardized, as per the exchange regulations**
* **specific, as to price, quantity, specifications, delivery date, terms etc.**

Distinction Between Forwards & Futures

	Forward	Future
*	Customized	Standardized
*	Private trading or OTC	Public Trading on Exchange
*	Default Risk exists	No Default Risk
*	Entire transaction is settled between same two parties	Stock Exchange is the Counter-party hence, both parties deal only with the Exchange
*	Can be closed out, but only by mutual consent	Can be closed out by any party, any time on the floor of the Exchange
*	No liquidity	Highly liquid

And, **in a futures contract, there is an *initial margin collected up-front, plus a daily, MTM (mark-to market) margin,*** *which both, the buyer and the seller have to deposit with the exchange*

This ensures that the maximum loss on a trade going awry, is limited to just ONE DAY'S VOLATILITY.

In all probability, if the risk-margining systems are well formatted, this one-day loss would be easily covered by the initial margin.

Hence, the risk of default becomes negligible in a Futures Contract.

Contrast this with a Forward Contract, settled only on maturity, with no margining provision. The entire profit of one party (or loss of the other), is paid out/in only on settlement date.

Some OTC exchanges now collect margins to negate this serious drawback of an otherwise very useful, customized forward contract.

Nevertheless, it is apparent from the above, that there is higher risk of default in a forward contract, relative to a futures contract; one part arising from counter-party risk, the other from lack of a robust margining system

Please permit this repetition: *FINANCIAL DERIVATIVES ARE A ZERO-SUM-GAME*

PRICING A FORWARD OR A FUTURE CONTRACT

(In reality, there is a difference in the price of a forward and a future contract of same terms, on the same underlying asset. Nevertheless, for an initial understanding, this base model is equally applicable in logic, to both)

Pricing a Forward or Future

S = Spot Price of the Underlying

F = Future/Forward Price
Also called
K = Strike Price (price contracted upfront in the contract)

t = Time to Maturity in Years

r = Interest Rate

For No-Arbitrage, it follows logically, that

F = S*(1+r)^(t) (discrete compounding)

F = S* e^(r*t) (continuous compounding)

This is the formula for continuous compounding, where 'e' is the Euler number with APPROXIMATE value of 2.71828

Please remember the definition of arbitrage. If this formula does not hold good, then one can buy in the market where price is lower, sell in the market where price is higher, pay interest on borrowing (whether cash or security) and still make a riskless profit on expiry.

Cash & Carry Arbitrage:

If F > S * (1+r)^(t)

Buy Cash (borrow money), sell Future today.
Sell Cash, buy Future on expiry, pay interest on borrowing and still make money

Example: Cash & Carry Arbitrage

Suppose the price of the underlying share is		**851.3**	
	On 8th March 2013		
Cost of Carry or "r"	on a discrete basis	**6%**	p.a.
What should be the calculated value of its Future,		(i.e. "no arbitrage price")	
	expiring on 28th March 2013	**?**	
	"n" = 20 days (remember, that equates with 20/365 years)		
	F = S * (1+r)^(n)	851.3* (1+ 6%)^(20/365)	
	No Arbitrage Futures Price	854.02	

Suppose the Actual Price of the Future is					**854.7**	
	F > S * (1+r)^(n)					
	The Investor would					
	on 8/3/2013		**Buy in Cash**			**851.3**
			Sell the Future			**854.7**
	on 28/3/2013		**Sell the Share**			
		Suppose Market Price on 28/3/2013 in Cash is				**900**
		Sell The Share in Cash @ 900/				
		Profit		**900-851.3**		**48.7**
		Pay Interest		**851.3 * .06*(20/365)**		**-2.80**
		Buy the Future @ 900/				
		Loss		**854.7-900**		**-45.3**
		NET PROFIT				**0.60**

Market Price on Expiry = 900/

Suppose the Actual Price of the Future is				**854.7**	
	F > S * (1+r)^(n)				
	The Investor would				
	on 8/3/2013	**Buy in Cash**			**851.3**
		Sell the Future			**854.7**
	on 28/3/2013	**Sell the Share**			
		Suppose Market Price on 28/3/2013 in Cash is			**800**
		Sell The Share in Cash @ 800/			
		Loss	800-851.3		-51.3
		Pay Interest	851.3 * .06*(20/365)		-2.80
		Buy the Future @ 800/			
		Profit	854.7-800		54.7
		NET PROFIT			0.60

Market Price on Expiry = 800/

	on 8/3/2013	**Buy in Cash**			**851.3**
		Sell the Future			**854.7**
	on 28/3/2013	**Sell the Share**			
		Suppose Market Price on 28/3/2013 in Cash is			**1000**
		Sell The Share in Cash @ 1000/			
		Profit	1000-851.3		148.7
		Pay Interest	851.3 * .06*(20/365)		-2.80
		Buy the Future @ 1000/			
		Loss	854.7-1000		-145.3
		NET PROFIT			0.60

Market Price on Expiry = 1,000/

<u>NET PROFIT IS THE SAME, NO MATTER WHAT THE SPOT PRICE, ON EXPIRY THAT'S ARBITRAGE</u>

<u>Reverse Cash & Carry Arbitrage:</u>

<u>If F < S * (1+r)^(t)</u>

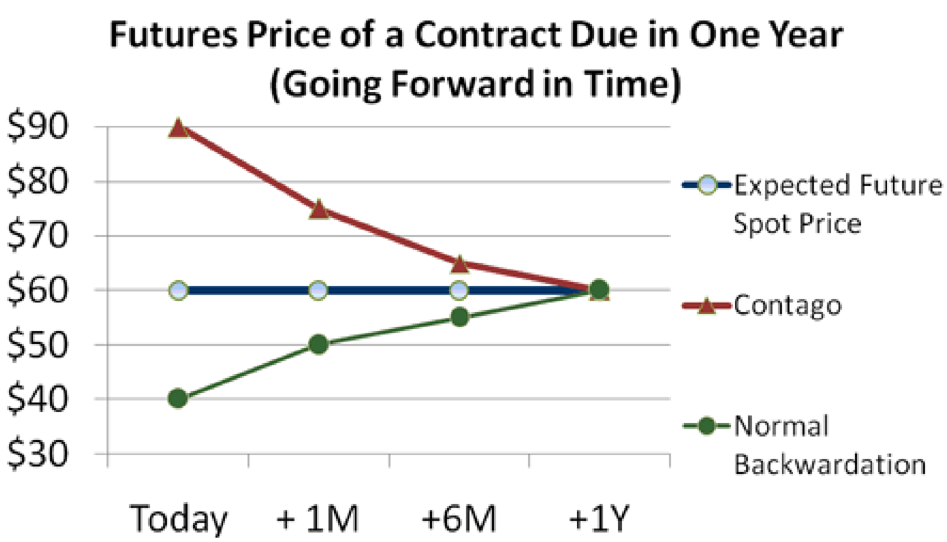
Buy Future, sell Cash today
Sell Future, buy Cash on expiry

<u>THERE IS NO FREE LUNCH</u>

Absolutely, the entire exercise above assumes one major event (normal and logical, but by no means, assured)…..**<u>CONVERGENCE</u>**

Arbitrage assumes that on expiry, the Spot Price & the Futures Price will converge (become one and the same). Notice that the closing legs of the transactions were executed at identical rates, for the arbitrage to hold true.

During the life-time of the contract, the futures price may be different from the spot (cash) price, but is assumed to *converge to spot price, on expiry*



<u>Contango:</u> **Futures price above spot price**

<u>Backwardation:</u> **Spot price above futures price**

<u>BASIS:</u> **S – F (spot price – futures price). This often gives rise to what is known as *basis risk*. (If basis is different at time of executing the contract and different at the time of closing out the contract)**

Assumptions behind Arbitrage

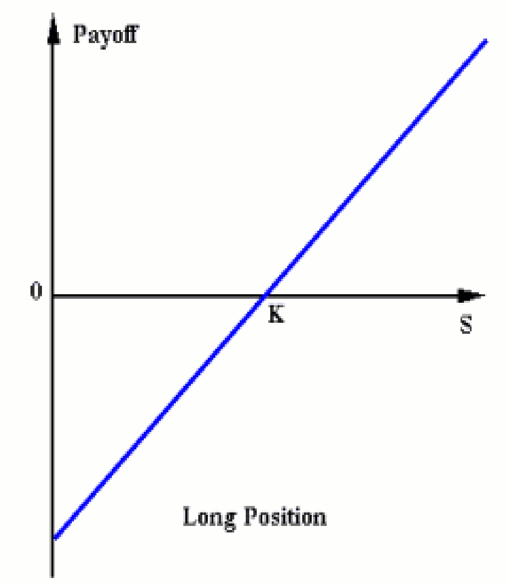
No transaction costs
No taxes
Seamless lending and borrowing of both, funds and shares (at same rate)

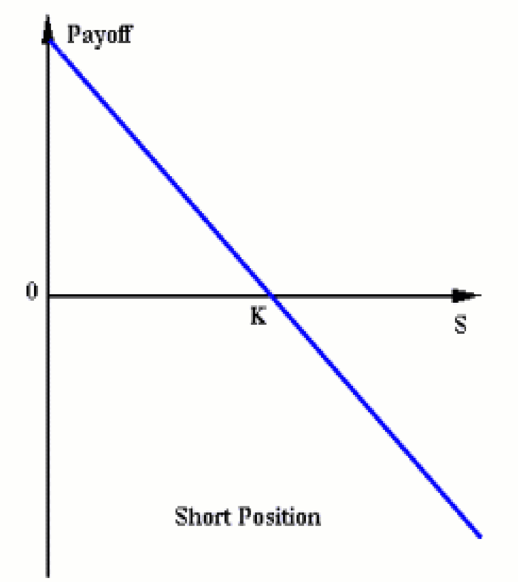
The assumptions can be modified to meet reality and still have a sound tool for trading, however, it is only for those with deep pockets and minimal costs. The profit we saw in our example, was only 60 ps per share. In perspective, each contract of Reliance Industries is of 500 shares and those who would venture to execute this trade, would probably execute say, 10,000 contracts. **Profit = .60 * 500 * 10000 = 3,000,000 (three million…not small anymore)**

Pay-off

Long Position: S – F or S - K (S = spot price, F or K = strike price)

Short Position: F – S or K – S





If I have bought one contract @ 750/ per share (F or K) & the spot price is 780/, payoff is + 30/ per share
For the person who sold the contract to me, has a payoff of -30/ per share

Caution: ***It is usually stated that both, profits and losses in a derivatives contract, are unlimited. The caveat is that asset prices cannot go below zero***

The person who sold the contract @ 750/ can lose an unlimited amount (sold, hence will lose when price rises and gain when price falls) but profits are limited to the share price, viz. 750/

In similar vein, I have purchased the contract @ 750/ per share. Theoretically, my profit is unlimited, but my loss is limited to 750/ being the cost per share

The charts above, make this point abundantly clear

OPTIONS:

An Option

Gives the Buyer the Right but Not the Obligation,

To Buy or Sell a contracted quantity of the Underlying,

at a pre-determined Price,

on or before a specified Date

This is a blatantly, one-sided contract: only one party seems to benefit, hence the Buyer of the Option pays to the Seller or Writer, an amount upfront, called the Option Premium

The Seller (or Writer) of the Option HAS THE OBLIGATION, (BUT NO RIGHT) to COMPLY WITH THE RIGHT OF THE BUYER OR OPTION HOLDER

Call Option:

Gives the buyer the right (without obligation)

To Purchase the Underlying

Put Option

Gives the buyer the right (without obligation)

To Sell the Underlying

There is a buyer & a seller for both, call & put options

The Profit of the Buyer is Unlimited, Loss is limited to the Option Premium paid

The Profit of the Seller is limited to the Option premium paid, the Loss is Unlimited

Options Explained:

European Options: Can be exercised only on maturity

American Options: Can be exercised at any time, on or before maturity

Please Note, this pertains only to exercise. The Options can be bought or sold at any time (an open position can be closed out at any time)

Expiration date – the date the option matures.

Exercise price - the contracted price at which the option can be exercised

Covered option – an option written against stock held in an investor's portfolio.

Naked (uncovered) option – an option written without the stock to back it up.

In-the-money call – a call option whose exercise price is less than the current price of the underlying stock. **K < S**

Out-of-the-money call – a call option whose exercise price exceeds the current stock price. **K > S**

At-the-money call – a call option whose exercise price is equal to the current stock price. **K = S**

In-the-money put – a put option whose exercise price is more than the current price of the underlying stock. **K > S**

Out-of-the-money put – a put option whose exercise price is less than the current stock price. **K < S**

At-the-money put – a put option whose exercise price is equal to the current stock price. **K = S**

In India, all financial derivatives are cash settled on the NSE.

On the BSE, derivatives on stocks can be delivery settled.

Worldwide, all index derivatives are cash settled

Commodity derivatives can be settled by delivery, or they may be cash settled.

Money-ness explained

Suppose for a Call option: K = 85/. S = 100/.

S > K, hence it is *in the money*

If this were a put option: it would be *out of the money*

Because: S > K

The logic is simple. You have purchased the call with a strike price of 85/

Today, the market price is 100/. In other words, you have a special right to purchase at 85/, while the rest of the world can only buy today, at 100/

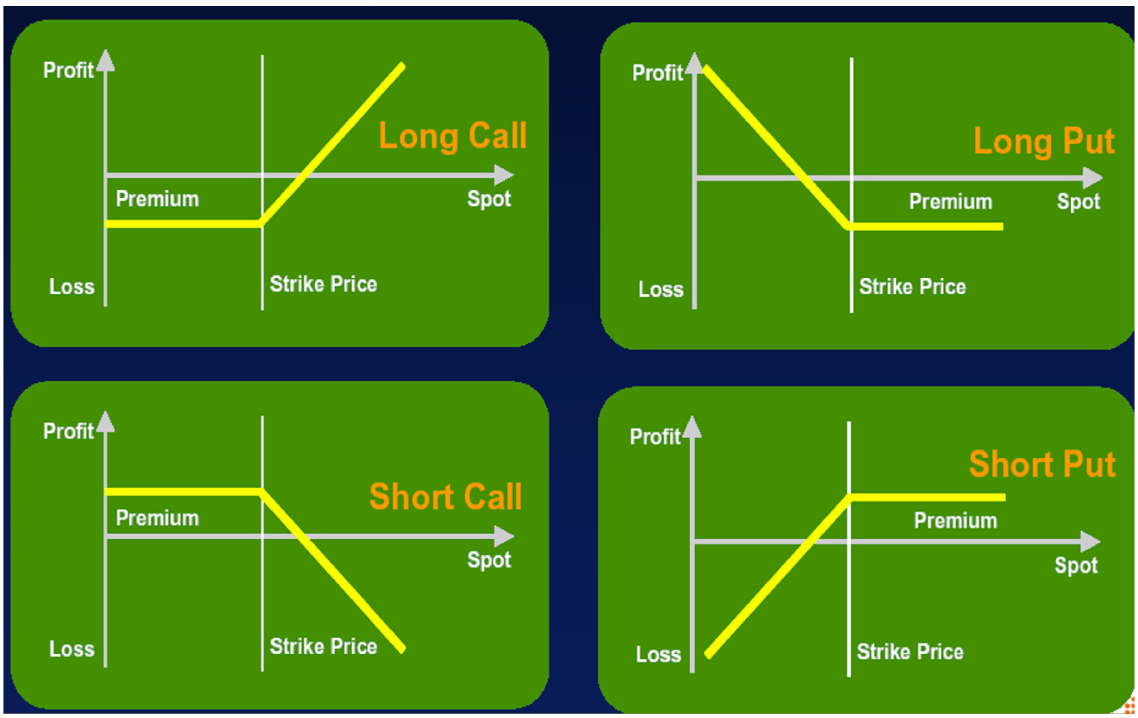
Should this right (option) have value? Certainly . **Hence, the call option is in the money**

Suppose this were a put option. You had the right to sell the underlying @ 85/ when the market price is actually 100/. Would you consider this option (right) valuable? Not at all, since you would be better off, ignoring your right & selling at the current market price.

Hence, the put option is out of the money

	Call Option	Put Option
In-the-Money	Spot > Strike	Spot < Strike
At-the-Money	Spot = Strike	Spot = Strike
Out-of-the-Money	Spot < Strike	Spot > Strike

Payoff vs Profit in Options:



Long Call: The buyer of the call has paid a premium. There is no further obligation, hence this is the **maximum loss**, irrespective of the price of the underlying, during the life-time of the call option. **Once the spot price moves above the strike price, the option will have a positive payoff for the buyer,** ***but there will still be a loss, since premium has been paid, which is yet to be recovered.*** **When S = K + p (Spot price = Strike price + premium), the option is at break-even point.**

When S > K, the call option is in-the-money & has a payoff

When S > K + p, the call option shows profit

<u>Short Call</u>: The seller of the call is in a position, which is a reflection (in water) of the buyer

Profit is limited to premium collected, payoff, break-even and loss are the reverse as those of the buyer.

<u>Long Put</u>: The buyer of a put is **bearish** on the stock **(usually, we do not connect buy with bearish).** The put gives an option to **sell**, which means the buyer of the put expects the price to come down.

Loss is restricted to the premium paid, **payoff starts when K > S, break-even occurs when K = S + p, profit begins after K > S + p**

When K > S, the put option is in the money

<u>Short Put</u>: The seller of the put option is actually bullish or neutral on the underlying

As explained above & visible in the chart, payoff, break-even & loss are the image (in water) of the buyer of the put

<u>Factors which Determine Option Prices</u>

Factor	*Call Value*	*Put Value*
Increase in Stock Price	**Increases**	**Decreases**
Increase in Strike Price	**Decreases**	**Increases**
Increase in variance of underlying asset	**Increases**	**Increases**
Increase in time to expiration	**Increases**	**Increases**
Increase in interest rates	**Increases**	**Decreases**
Increase in dividends paid	**Decreases**	**Increases**

<u>Value of an Option (can never be negative)</u>

Suppose S = 100/ K = 90/

If this is a call option, its intrinsic value is 10/ Max(S-K,0)

If this is a put option, its intrinsic value is 0 : Max(K-S,0)

Suppose the Premium on the Call option shown above

is 15/

Then, the Time Value of the Option is 5/ (Premium – Intrinsic Value)

For the Put Option above, if the premium was 6/, the entire amount

would be the Time Value, since the Intrinsic Value is zero

Time Value diminishes constantly, as time elapses & becomes zero on Expiry (also known as time decay)

c = value of an European Call Option

C = value of an American Call Option

p = value of an European Put Option

P = value of an American Put Option

<u>Usually, because of the entitlement to early exercise,</u>

$C \geq c$

$P \geq p$

<u>BLACK SCHOLES MERTON MODEL…..THE MIDAS FORMULA</u>

Scholes & Merton won the Nobel Prize for this seminal work. (Fischer Black unfortunately, died before he could receive his accolades from the Nobel Committee, though they did break from tradition & make special mention of his contribution. The Nobel Prize is not awarded posthumously)

$$c = S_0 N(d_1) - X e^{-rT} N(d_2)$$

$$p = X e^{-rT} N(-d_2) - S_0 N(-d_1)$$

where $$d_1 = \frac{\ln(S_0 / X) + (r + \sigma^2 / 2)T}{\sigma\sqrt{T}}$$

$$d_2 = \frac{\ln(S_0 / X) + (r - \sigma^2 / 2)T}{\sigma\sqrt{T}} = d_1 - \sigma\sqrt{T}$$

N(d1) is the delta of the call & N(d2) is the probability that the option will be exercised in a risk neutral world

In other words, S*N(d1) is the change in call premium due to change in the underlying: or: expected benefit of purchasing the underlying outright

X*e^(-rT)*N(d2) is the discounted value of paying the exercise price on expiration

It is beyond the scope of this introductory paper, to delve into detailed understanding of this intricate formula. The reader is encouraged to study further for a strong understanding of the BSM Formula.

Distinction between Options and Futures

Options	**Futures**
Buyer has the right, Seller has the obligation	Both have obligation
Premium is the price paid by the Buyer	No Premium

No Margin for Buyer Seller has to pay a Margin	Both parties pay a Margin
Can expire, un-exercised	Has to be closed either by Reversing the trade or by delivery/purchase
No MTM	Daily MTM

HEDGING

HEDGING DOES NOT MAXIMIZE PROFIT.

HEDGING IS A RISK MITIGATION OR RISK ELIMINATION TOOL

OFTEN, IT WILL APPEAR THAT THE HEDGE RESULTED IN SUB-OPTIMAL PROFITS

Hedging With Futures…..Long Hedge

Suppose

Commitment to buy 1000 barrels of crude oil after 3 months at the then prevailing spot price say S

Futures Price for delivery after 3 months = 98.75

Strategy

Go long a 3 months future contract to lock in a price now

At maturity go short a futures to close the position

Outcome	Cash Paid: Spot Purchase	Gain/Loss From Futures	Net Paid
S = 99.5	-99.5	99.5-98.75 = + .75	98.75
S = 97.5	-97.5	97.5-98.75 = -1.25	98.75
S = 98.75	-98.75	98.75-98.75 = 0	98.75
The Hedge here, always guarantees a price of 98.75			

Please remember: Assumptions, convergence: no transaction costs: no taxes

Hedging With Futures…..Short Hedge

Suppose

Commitment to sell 1000 barrels of crude oil after 3 months at the then prevailing spot price S

Futures Price for delivery after 3 months = 98.75

Strategy

Go short a 3 months future contract to lock in a price now

At maturity go long a futures to close the position

Outcome	Cash From Spot Sale	Gain/Loss From Futures	Net in Hand
S = 99.5	99.5	98.75-99.5 = -.75	98.75
S = 97.5	97.5	98.75-97.5 = + 1.25	98.75
S = 98.75	98.75	98.75-98.75 = 0	98.75
The Hedge here, always guarantees a price of 98.75			

Please remember: Assumptions, convergence: no transaction costs: no taxes

SWAPS

A Swap is an agreement between two counterparties to exchange cash flows on specific dates, based on the terms of the contract entered into

In an interest rate swap, the Principal amount does not change hands. Interest payments are exchanged, based on the "NOTIONAL PRINCIPAL"

INTEREST RATE SWAPS DO NOT GENERATE NEW FUNDING: THEY MERELY CONVERT THE PAYMENT OF INTEREST, FROM FIXED TO FLOATING RATE & VICE VERSA (Plain Vanilla Swap)

Types of Swaps

- Currency
- Interest Rate
- Equity
- Commodity
- Others

Example "Plain Vanilla" Interest Rate Swap (IRS)

"A" has borrowed US$ 100 million @ 6 month LIBOR for 3 years

But "A" has inflows which are of a fixed rate

Hence, there is the risk of a cash flow mismatch & an Interest Rate Risk (if LIBOR increases)

For "A" to enter into an IRS, there must be a counter-party "B", with a different view on the market, or an opposing requirement

"A" agrees to receive 6 month LIBOR from "B" & to pay "B" a fixed rate of 5% p.a. (payable HLY) for 3 years (i.e. 6 * HLY interest transactions)

Notional Principal is US$ 100 million

Cash Flows for "A" Million US$ (NOTIONAL PRINCIPAL US$ 100 MN)

Date	**LIBOR RATE**	**FLOATING CASH FLOW**	**FIXED CASH FLOW**	**NET CASH FLOW FROM SWAP**
5/3/2004	4.2%			
5/9/2004	4.8%	+2.10	-2.50	-0.40
5/3/2005	5.3%	+2.40	-2.50	-0.10
5/9/2005	5.5%	+2.65	-2.50	+0.15
5/3/2006	5.6%	+2.75	-2.50	+0.25
5/9/2006	5.9%	+2.80	-2.50	+0.30
5/3/2007	6.4%	+2.95	-2.50	+0.45

(interest is set every 6 months, in advance)

Let us combine this cash flow with the floating outflow as per "A"'s original contract

Date	**Floating Cash Flow Payable**	**Cash Flow From Swap US$ million**	**Net Cash Flow Payable**
5/9/2004	-2.10	-0.40	-2.50
5/3/2005	-2.40	-0.10	-2.50
5/9/2005	-2.65	+0.15	-2.50
5/3/2006	-2.75	+0.25	-2.50
5/9/2006	-2.80	+0.30	-2.50
5/3/2007	-2.95	+0.45	-2.50

Voila! "A" now has a guaranteed payable of 2.50% every 6 months, or 5% p.a., irrespective of the LIBOR

High Points for this Swap

If LIBOR > 5%, then fixed payer receives the interest differential.

If LIBOR < 5%, then floating payer receives the interest differential.

If LIBOR=5%, then neither party receives nor pays anything.

Conclusion:

Financial Derivatives are here to stay. Their use is widespread & meaningful. However, unfettered, rampant abuse is an invitation to disaster.

Consider the following:

Investor "A" buys 500 shares of Reliance @ 1,000/ After 3 months, the price is 1,200/

Investor "B" buys 1 futures contract (lot size, 500 shares) of Reliance with strike price of 1,000/ (upfront margin is 20%)

The comparative statement highlights the lure of derivatives

Investor	Investment	Profit	Profit as % of investment
A	**500,000**	**100,000**	**20%**
B	**100,000**	**100,000**	**100%**

Suppose the price fell to 800/

The following table shows how capital can be severely dented

Investor	Investment	Profit	Profit as % of investment
A	**500,000**	**-100,000**	**-20%**
B	**100,000**	**-100,000**	**-100%**

Please remember:

Every business faces risks

The quest for high returns usually entails high risks

High risk does not guarantee high returns

Financial derivatives can be used to manage risk

Please, please, please …be the master when you use derivatives,

Do not let financial derivatives make you a slave

Best of luck & do keep sharpening your skills !

Parting Thought: ***There is no room for the kind of blind speculation that produces booms and blights.*** ***Art Seidenbaum***

Suggested Readings:

Options, Futures and Other Derivatives…..John C Hull