Workshop on

Derivatives - Pakistan Perspective

Organized By: TOTAL BIZ SOLUTION

Facilitator : Muhammad Farid Alam, FCA

CEO – AKD Securities Limited

Table of Contents

Derivatives

Table of Contents

Table of Contents

Derivatives - Definition & Characteristics

A derivative is a financial instrument or other contract with all three of the following characteristics:

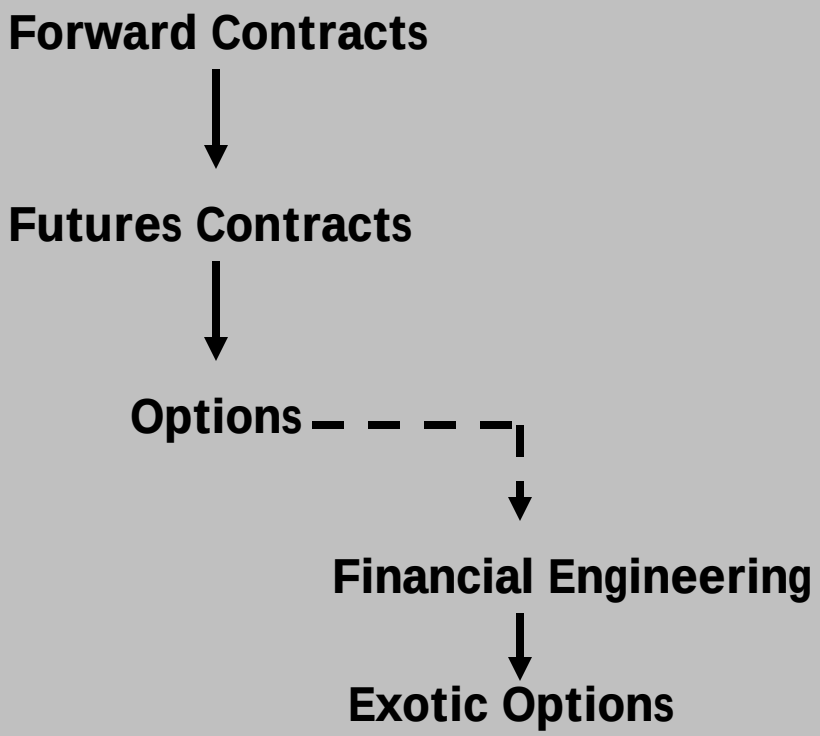
- Its value changes in response to the change in the underlying asset i.e. commodity price, exchange rate
- It requires no initial net investment or the initial net investment is smaller than would be required for other types of contracts that would be expected to have a similar response to changes in market factor
- It is settled at a future date

Derivatives – Definition

A financial instrument whose characteristics and value depend upon the characteristics and value of an underlying asset, typically a commodity, bond, equity or currency. Examples of derivatives include futures and options *(Source: Investor Words.com)*

Derivatives – Evolution of Derivatives

If one examines the evolution of derivative markets and instruments the progression has been as follows:



Derivatives – Characteristics

Characteristic of Derivatives

- Sophisticated, Dynamic Risk Management Instruments
- Types of Derivatives
  - ✓Forward: A customized, risk-exposed contract for a future trade
  - ✓Futures: A standardized, exchange-traded, daily-settled forward
  - ✓Swap: A multiple of forwards with periodic settlements
  - ✓Option: A forward synthesized with a risk-free asset
- Derivative, Dependent, Contingent, Conditional, Synthetic, Hybrid,
- Flexible, Dynamic, Adaptive, Proactive, Versatile, ...

Derivatives – Characteristics

Derivatives allow investors to earn large returns from small movements in the underlying asset's price. However, investors could lose large amounts if the price of the underlying moves against them significantly. There have been several instances of massive losses in derivative markets.

"A lousy trillion? Call me when you're ready to talk some real money."

Derivatives – Market

Table 19: Amounts outstanding of over-the-counter (OTC) derivatives

By risk category and instrument

In billions of US dollars

Source: BIS

	Notional amounts outstanding					Gross market values				
Risk Category / Instrument	**Jun 2006**	**Dec 2006**	**Jun 2007**	**Dec 2007**	**Jun 2008**	**Jun 2006**	**Dec 2006**	**Jun 2007**	**Dec 2007**	**Jun 2008**
Total contracts	**370,178**	**414,845**	**516,407**	**595,341**	**683,725**	**9,949**	**9,691**	**11,140**	**15,813**	**20,353**
Foreign exchange contracts	**38,127**	**40,271**	**48,645**	**56,238**	**62,983**	**1,136**	**1,266**	**1,345**	**1,807**	**2,262**
Forwards and forex swaps	19,407	19,882	24,530	29,144	31,966	436	469	492	675	802
Currency swaps	9,696	10,792	12,312	14,347	16,307	535	601	619	817	1,071
Options	9,024	9,597	11,804	12,748	14,710	165	196	235	315	388
Interest rate contracts	**262,526**	**291,582**	**347,312**	**393,138**	**458,304**	**5,445**	**4,826**	**6,063**	**7,177**	**9,263**
Forward rate agreements	18,117	18,668	22,809	26,599	39,370	25	32	43	41	88
Interest rate swaps	207,588	229,693	272,216	309,588	356,772	4,840	4,163	5,321	6,183	8,056
Options	36,821	43,221	52,288	56,951	62,162	580	631	700	953	1,120
Equity-linked contracts	**6,782**	**7,488**	**8,590**	**8,469**	**10,177**	**671**	**853**	**1,116**	**1,142**	**1,146**
Forwards and swaps	1,430	1,767	2,470	2,233	2,657	147	166	240	239	283
Options	5,351	5,720	6,119	6,236	7,520	523	686	876	903	863
Commodity contracts	**6,394**	**7,115**	**7,567**	**8,455**	**13,229**	**718**	**667**	**636**	**1,899**	**2,209**
Gold	456	640	426	595	649	77	56	47	70	68
Other commodities	5,938	6,475	7,141	7,861	12,580	641	611	589	1,829	2,142
Forwards and swaps	2,188	2,813	3,447	5,085	7,561					
Options	3,750	3,663	3,694	2,776	5,019					
Credit default swaps	**20,352**	**28,650**	**42,580**	**57,894**	**57,325**	**294**	**470**	**721**	**2,002**	**3,172**
Single-name instruments	13,873	17,879	24,239	32,246	33,334	186	278	406	1,143	1,889
Multi-name instruments	6,479	10,771	18,341	25,648	23,991	109	192	315	859	1,283
Unallocated	**35,997**	**39,740**	**61,713**	**71,146**	**81,708**	**1,685**	**1,609**	**1,259**	**1,788**	**2,301**
Memorandum Item:										
Gross Credit Exposure						2,032	2,036	2,672	3,256	3,859

Derivatives

Derivatives generate reported earnings that are often widely overstated and based on estimates whose inaccuracy may not be exposed for many years."

Warren Buffet

Derivatives – List of significant losses

	Nominal Amount Lost	USD Equivalent at time of loss	Real Amount Lost	Country	Company	Source of Loss	Year	Person(s) associated with incident
1	EUR 4.9 bn	USD 7.1 bn	USD 7.1 bn	France	Société Générale[2]	European Index Futures	2008	Jérôme Kerviel
2	USD 6.5 bn	USD 6.5 bn	USD 6.7 bn	Canada	Amaranth Advisors[3]	Gas Futures	2006	Brian Hunter
3	USD 4.6 bn	USD 4.6 bn	USD 5.85 bn	United States	Long Term Capital Management[4]	Interest Rate and Equity Derivatives	1998	John Meriwether
4	JPY 285 bn	USD 2.6 bn	USD 3.44 bn	Japan	Sumitomo Corporation[5]	Copper Futures	1996	Yasuo Hamanaka
5	USD 1.7 bn	USD 1.7 bn	USD 2.38 bn	United States	Orange County[7]	Interest Rate Derivatives	1994	Robert Citron
6	BRL 4.62 Bn	USD 2.1 Bn ;	USD 2.1 bn	Brazil	Aracruz[8]	FX Options	2008	Isac Zaguri, Rafael Sotero
7	EUR 1.4 bn	USD 1.9 bn	USD 1.97 bn	Austria	BAWAG[9]	Foreign Exchange Trading	2000	Wolfgang Flöttl, Helmut Elsner[10]
8	DEM 2.63 bn	USD 1.38 bn	USD 1.96 bn	Germany	Metallgesellschaft[11]	Oil Futures	1993	Heinz Schimmelbusch[12]
9	HKD 14.7 bn	USD 1.9 bn	USD 1.9 bn	China	CITIC Pacific[13]	Foreign Exchange Trading	2008	
10	GBP 827 mio	USD 1.32 bn	USD 1.8 bn	United Kingdom	Barings Bank[14]	Nikkei Futures	1995	Nick Leeson

Why Derivatives?

- Growing Diversity and Volatility in Risk Sources
- Diversification/Sophistication in Corporate Financial Management and Investment Needs
- Global + Local => Globalization
- Integration => Segmentation
- Regulation => Deregulation => Liberalization
- Intermediation => Disintermediation => Re-intermediation
- Securitization => Financial Engineering

Derivatives – Why Derivatives

- As with any other financial products, derivatives were the result of financial innovation. Innovation that responded to the then existing need to help manage risk in increasingly sophisticated business environments.

- While forward contracts were originally innovated for risk-management of agro-based products, the later instruments were needed as risk environments changed.

- Each step down the evolutionary chain; added value.

✓ Forward Futures; reduced

- ➢Liquidity risk
- ➢Counterparty risk
- ➢Avoid price squeeze etc.

✓ Futures Options

- ➢Increased flexibility
- ➢Ability to take advantage of favorable price movements (unlike lock-in)

- *managing contingent claims/liabilities.

- The objective of all these innovation is Risk Management.

Derivatives - User of Derivative Products

- Derivatives markets whether OTC or exchange Traded provide a platform for trading of risks. These markets exist to facilitate the transfer of market risk from individuals or institution that wish to avoid such risks or who are better equipped to manage them. The users of Derivative Products can be broadly categorized into three groups:

✓ *Hedgers* – who locks in future prices of products and commodities that are essential to their business

✓ *Speculators* – are diverse group that includes day traders, financial institutions etc based on their expertise and knowledge take position to make profit

✓ *Arbitragers* – are professional individuals and adhoc organization that specialize in espying and taking advantage of price differential in underlying or derivative instrument

Derivatives - User of Derivative Products

- Derivative instruments are used by broad spectrum of market players with varying investment horizons and risk preferences/appetite.

✓ Individuals – They prefer option because of their leveraging or gearing features

✓ Institutional Investor – They use derivative in their Asset allocation strategy.

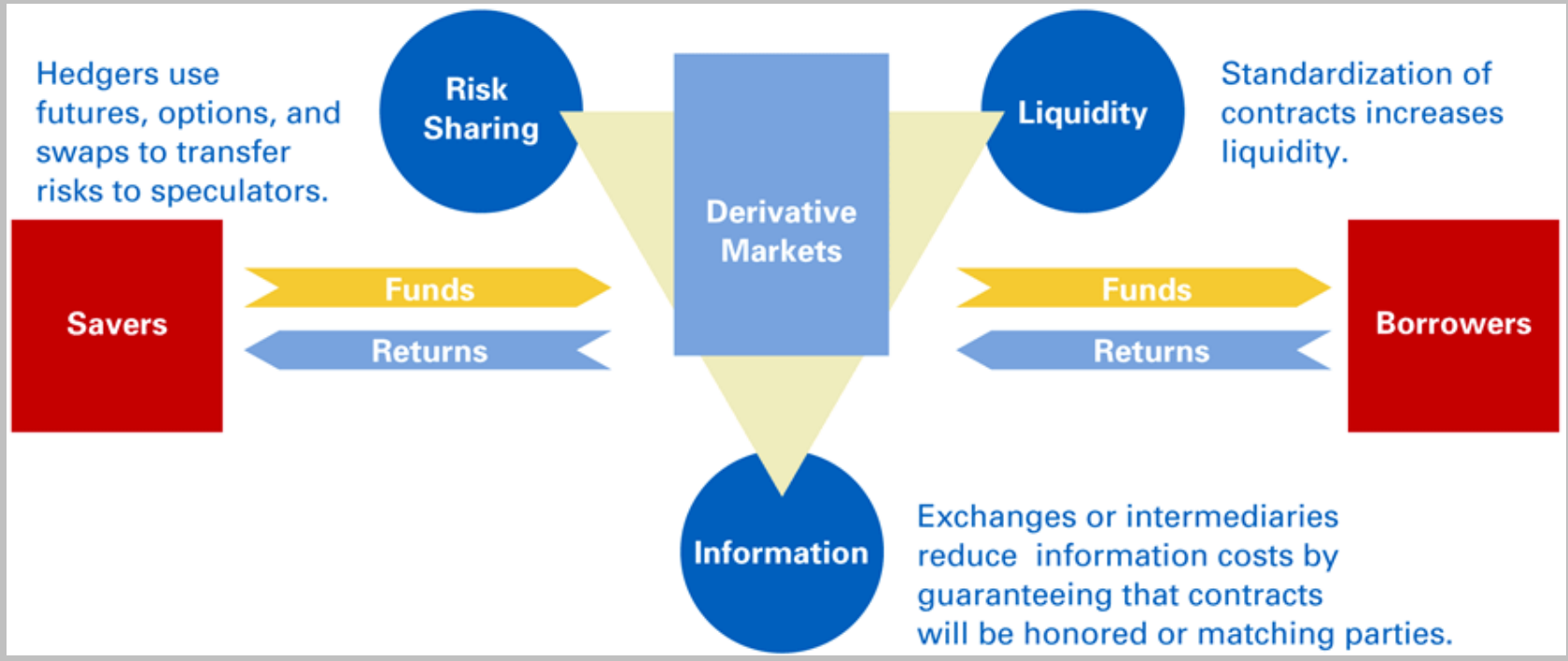
✓ Corporate Treasurer – use derivative for both hedging exposure and for enhancing yields

✓ Banks/Other Financial Intermediaries – are attracted towards these instrument for their strategic risk management features. Desk and floor traders capitalize on their superior market information and use derivative to

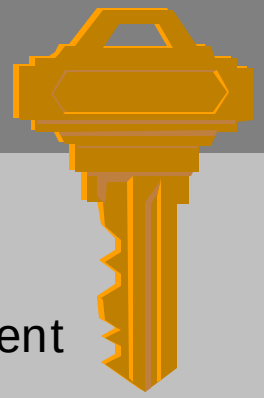
- ➢ Speculate
- ➢ Hedge speculative position

Derivatives - User of Derivative Products

The following is a graphical illustration highlighting various users of Derivatives Instruments

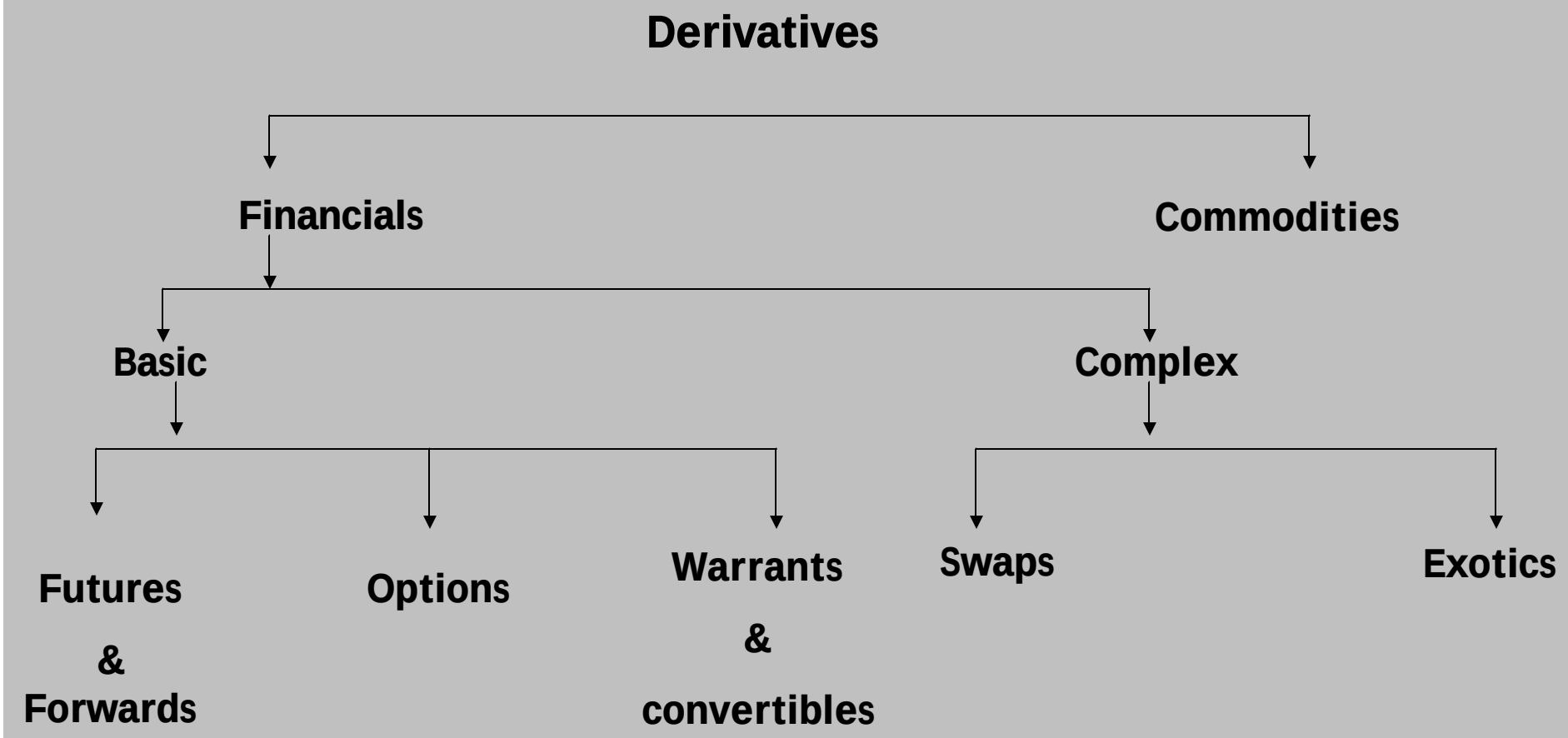


Derivatives – Key Concepts in Derivatives

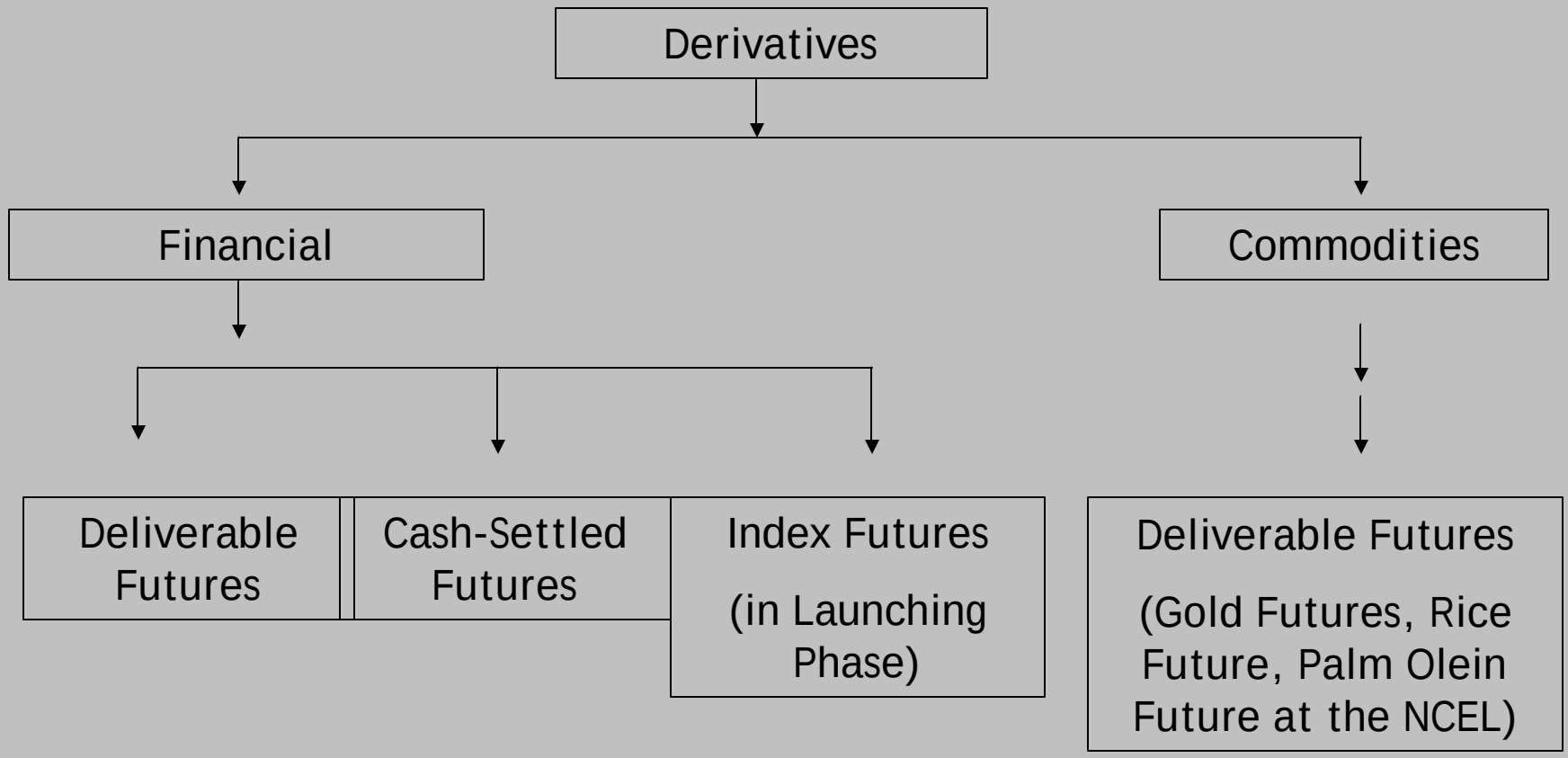


- Volatility: Derivatives feed on volatility!
- Liquidity: Derivatives markets cannot function properly w/o sufficient liquidity - easy entry and easy exit
- Hedging: Risk-avoiding strategy to protect position values
- Speculation: Risk-taking, dynamic investing strategy to generate high returns
- Arbitrage: Risk free, profit-seeking strategy from temporary price distortion
- Symmetry: Long Vs. Short - A Zero-sum Game!
- Leverage: Small Commitment - Large Consequence
- Fungibility: Substitutability of assets/contracts (Money - Commodity)

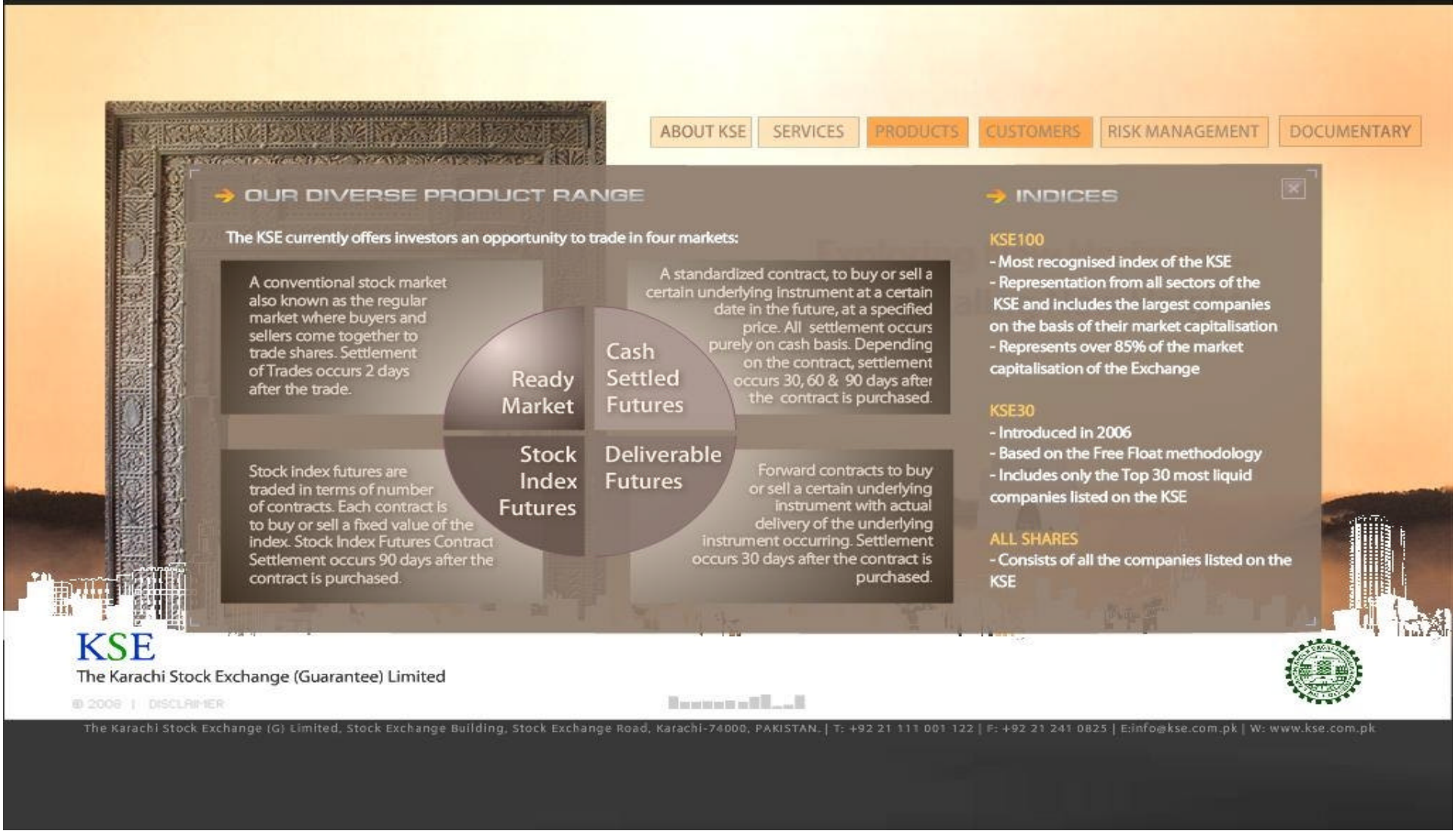
Derivatives – Types of Derivatives



Derivatives available in Pakistan's Capital Markets



Services offered by Karachi Stock Exchange



Futures & Forwards

Derivatives – Characteristic

- Forward

✓ A forward contract calls for the delivery of an asset (real or financial) at a future date for a predetermined price.

✓ Informal, private, customized and risk-exposed (because of inherent, strong incentives to default) waiday ka sauda at local exchanges.

- Futures

✓ A formal, standardized exchange-traded contract in which the underlying asset will be delivered on a future date at a specified price.

Derivatives – Types of Derivatives

Cash-Settled Futures (CSF) at the KSE – Yet to Gain Popularity

- Introduced early in 2007. Not gained popularity at all. Presently 15 companies are available for these cash-settled futures.
- Standard contract is of 30, 60 and 90 day duration, with daily marked-to-market of losses & gains. There is necessarily an equal number of buyers and sellers in the market and thus smooth settlement on the last day of the contract is ensured.
- Mutual fund are not allowed to trade in future as per Section 58 of NBFC regulation
- Not gaining popularity because of the availability of other resembling leveraging instrument of CFS and also because of liking for deliverable futures for various reasons. *Remember word underlying asset in definition*
- However, on the recommendation of the committee CFS MK II and deliverable futures have been discontinued recently.

Derivatives – Types of Derivatives

Types of Futures

- Stock futures – Tracks the performance of a SCRIP
- Stock Index futures – Tracks the performance of an INDEX
- Both can be further classified into two types:
  - ✓Cash Settled Futures
  - ✓Deliverable Futures
- Internationally cash settled futures are more popular. (available in Pakistan)

Derivatives – Futures Market Cover Almost Everything …

Grains & Oilseeds:	wheat, corn, oats, soybeans, red beans, rye, rice, barley, rapeseed, flaxseed, blackseed,.
Foods & Fibers:	cocoa, coffee, frozen OJ, sugar, cheese, flour, potatoes, copra, dry milk, …
Livestock & Meat:	live cattle, feeder cattle, hogs, piglets, pork bellies, lamb, chicken, …
Metals:	copper, gold, silver, zinc, platinum, lead, tin, nickel, palladium, aluminum alloy, …
Oil & Gas:	crude oil, heating oil, unleaded gasoline, natural gas, gas oil, propane, …
Other Materials:	cotton, wool, lumber, rubber, yarn, raw silk, dry cocoon, scrap metals, fertilizers,…

Derivatives – Mechanics of Future Trading

- Mark to Market

  ✓ Daily Profit/Loss Recognition

- As the day's trades are completed, all futures contracts are marked to the market at the settlement price.

  (futures = a series of one-day forwards)

- While the credited profits are withdrawable, the trader must replenish the account if it falls below the maintenance margin.

- Margin call: When the market moves against the position by:

  (Initial Margin - Maintenance Margin)

Derivatives – Mechanics of Future Trading

- Deliverable Futures (at the KSE)------(Discontinued recently)

✓ Investors can BUY (go long) or SELL (go short) in a future, depending upon his / her view about the stock. Shares of 42 companies are eligible for trading on the futures counter at the KSE.

✓ Standard contract of up-to five-week duration. In the last week of every month, the contract for the next month is opened (roll-over week). First Wednesday of next month is the settlement date.

✓ Excessive positions / trading discouraged to avoid / reduce manipulation. Risk management is stringent (client-wise and broker-wise position limits are in place).

✓ 'Provisional trading' at the time of the IPO of a share is also an example of futures trading.

Derivatives – Mechanics of Future Trading

- Ready-Future Hedging – has been the most common use of Deliverable Futures

- Commonly used by fixed income investors (AMCs Fixed income funds) to earn through 'spread transactions'. That is, typically the price of a future is higher than the ready market price of that share.? So BUY in ready and SELL the same share in the futures contract to earn a spread). For example:

Price per share Bank Al-Falah on the ready market	Rs 50.90
Price per share Bank Al-Falah on the futures market	Rs 51.25
Difference / spread	Rs 0.35

- Days between the settlement of the futures market transaction and that of the ready market
  = 5th Dec '07 – 13th Nov '07 = 21 days

  Gross spread earned is = (Rs 0.35 / Rs 50.90) x (365 / 21) x 100 = 11.95%

- The gains can be potentially higher if there is an opportunity to 'reverse' the spread transaction before the settlement date)

Stock futures

Derivatives – About Stock Future

- **Stock Future in Pakistan**

✓ Stock Futures were introduced at local bourses in September 2001, almost the same time as in India

✓ At beginning, investor's awareness in Pakistan was obviously low but gradually investor understanding regarding stock futures has increased and current stock futures are frequently used as a source of leveraging at KSE, Fixed income funds size ….

✓ During 2007-2008 average daily volume in future counter has been 26.81% of the total volume traded at ready markets

✓ Currently 42 stocks are trading on the futures counter at KSE vs. 119 scrips in India

Derivatives – Mechanics of Future Trading

- **Ready Future Hedging**

✓ **Commonly used by fixed income investors to lend to leveraged investors without taking price risk**

✓ **To Hedge price risk, players take opposite positions (buy in ready and sell in future contract)**

Example

Bought PTC in ready market @ PkR47
Settlement in 1 month
Sold PTC in a future contract @ PkR47.50
End of month profit is PkR0.50, which is 12.8% annualized yield

Derivatives – Mechanics of Future Trading

- **Hedging with Futures - Going Long**

✓ **Long hedge : Buy futures contract**

✓ **Objective : Benefit from a rise in a stock price**

✓ **Typical use : A investor whose view is that the market or stock price is going to go up, by the agreed delivery date**

Example:

PTC is trading in ready market @PkR47.00, i.e. PkR 47,000 investment

PTC future contract is trading @PkR47.50, i.e. PkR47,500 for 5,000 shares at 20% margin

If the market price of PTC goes up by PkR1.5 in 1 months time (future settlement date), the respective gain in the ready market would be, PkR1,500 while if bought in the future contract, the gain would be PR7,500.

Thus with approximately the same investment, the return is much higher in futures market

Derivatives – Mechanics of Future Trading

- **Hedging with Futures - Going Short**

✓ **Short hedge : Sell futures contract**

✓ **Objective : Protection against a fall in stock price**

✓ **Typical use : A investor whose view is that the market or stock price is going to go down, by the agreed delivery date**

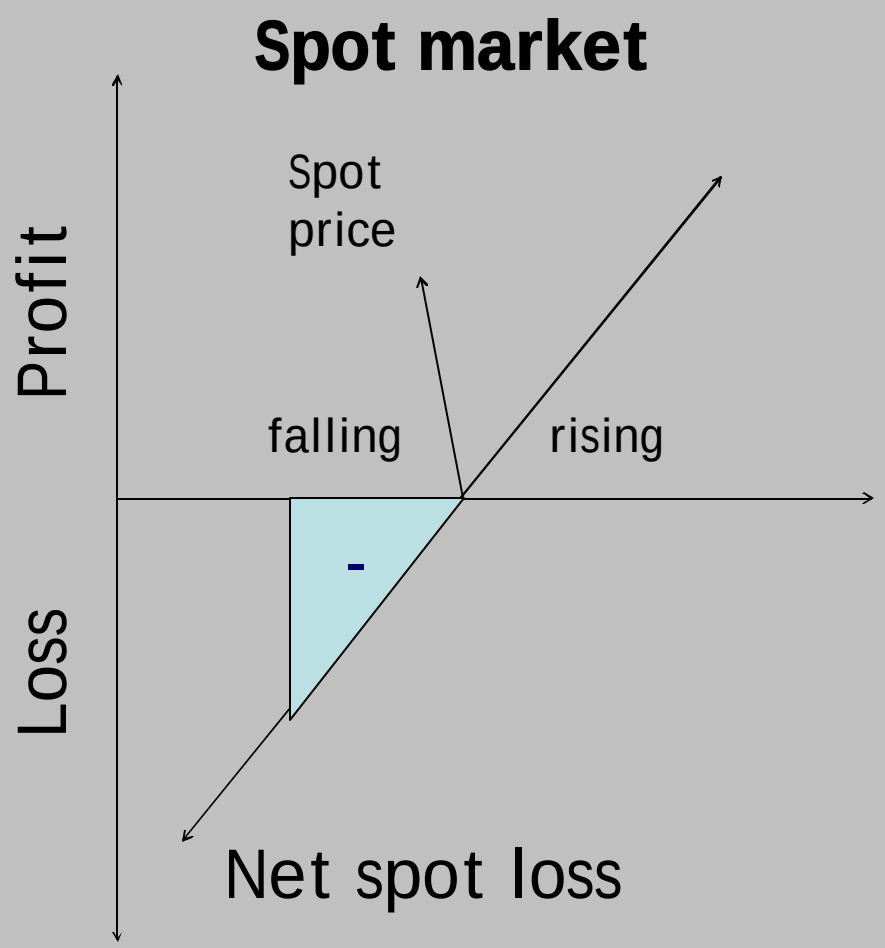
Example:

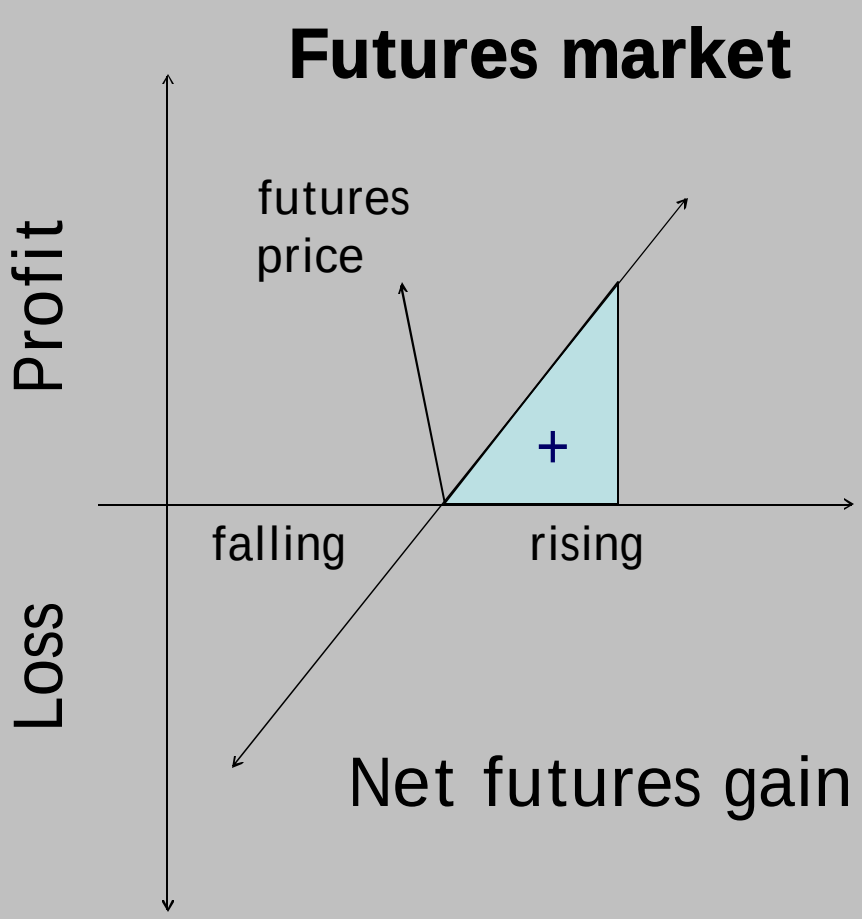
A bearish investor cannot short in the ready market

However, in the futures market, the investor can short sell in the PTC future contract at PkR47.50, i.e. PkR47,500 for 5,000 shares at 20% margin

If the market price of PTC goes down by PkR1.5 in 1 months time (future settlement date), the respective gain in the futures market would be PkR7,500 ignoring financial costs

Derivatives – Graphical illustration





Stock Index futures (SIFC)

Derivatives – About SIFC

- Stock Index Futures Contracts
- Introduced in 1980 at NYSE
- (This product has taken 28 years to reach the Pakistani market) Normally, index futures have been introduced first in capital markets as against stock futures
- Creates Link between Stock and Futures Market
- Increases Institutional Investor base
- Within 2 years outnumbered cash Market volumes at NYSE

Derivatives – About SIFC

- **KSE 30 Index Future exists - at least on KATS Screen**

✓ **The KSE is 'writer' / manager of this instrument.**

✓ **The index future would be cash-settled and traded on the exchange. Standard contract is of 30 60 or of 90-day duration.**

✓ **Trading lot is marketable lot of 500 shares called 'contracts', with each contract being 'valued' theoretically at the KSE-30 index level. Thus if the KSE-30 index level is at 10,014, the price per contract should also be near Rs 10,014.**

✓ **Typical use : A investor who has a view on the market direction but not any specific stock, can take a position on the 'market'.**

Derivatives – About SIFC (Food for Thought)

- Whereas the typical use of index futures is to provide the investors with an avenue for going long (buying) or going short (selling) and index futures, *one cannot ignore the fact that taking a position on the market cannot really be taken by completely ignoring the stock that are a constituent of the KSE-30 index. Such 'passive' management of portfolios can result in a dangerous tendency amongst money managers of not doing enough home-work in terms of finding suitable investment avenues for their clients and engaging in excessive speculation.*

- Presently the banking sector is 'over-represented' in the KSE-30 index and any developments in this sector alone can significantly distort 'efficient pricing' of the instrument.

Derivatives – Why SIFC

- HEDGERS use stock index futures in reducing the risk associated with a portfolio of stocks. Fund managers often develop and hold an index of stocks to ensure the bare minimal returns which is at par with the market.

- An investment strategy that attempts to profit from the differences between actual and theoretical futures prices of the same stock index. This is done by simultaneously buying (or selling) a stock index future while selling (or buying) the stocks in that index. Henceforth, the volume of trading in stock index futures contract reveals the interest in these instruments that is shared by a broad cross section of market participants.

Derivatives – SIFC Hedging

- To Hedge 1.75 Million of KSE-30 Stocks/portfolio that move 1 for 1 (perfect correlation) whereby KSE-30 trading at 17,500, you would:-

- Sell 1.75 Million of Stock Index Future Contracts i.e. 175,000 Contracts.

175,000 X 10 = 1.75 Million

- Suppose at the end the end of Contract KSE-30 is at 18,000, than futures position is up by 50,000

- Sell 1.75 Million of Stock Index Future Contracts i.e. 175,000 Contracts.

- 175,000 X 10 = 1.75 Million

- Suppose at the end the end of Contract KSE-30 is at 16,000, the portfolio is protected for downside risk, the risk that value in portfolio will fall.

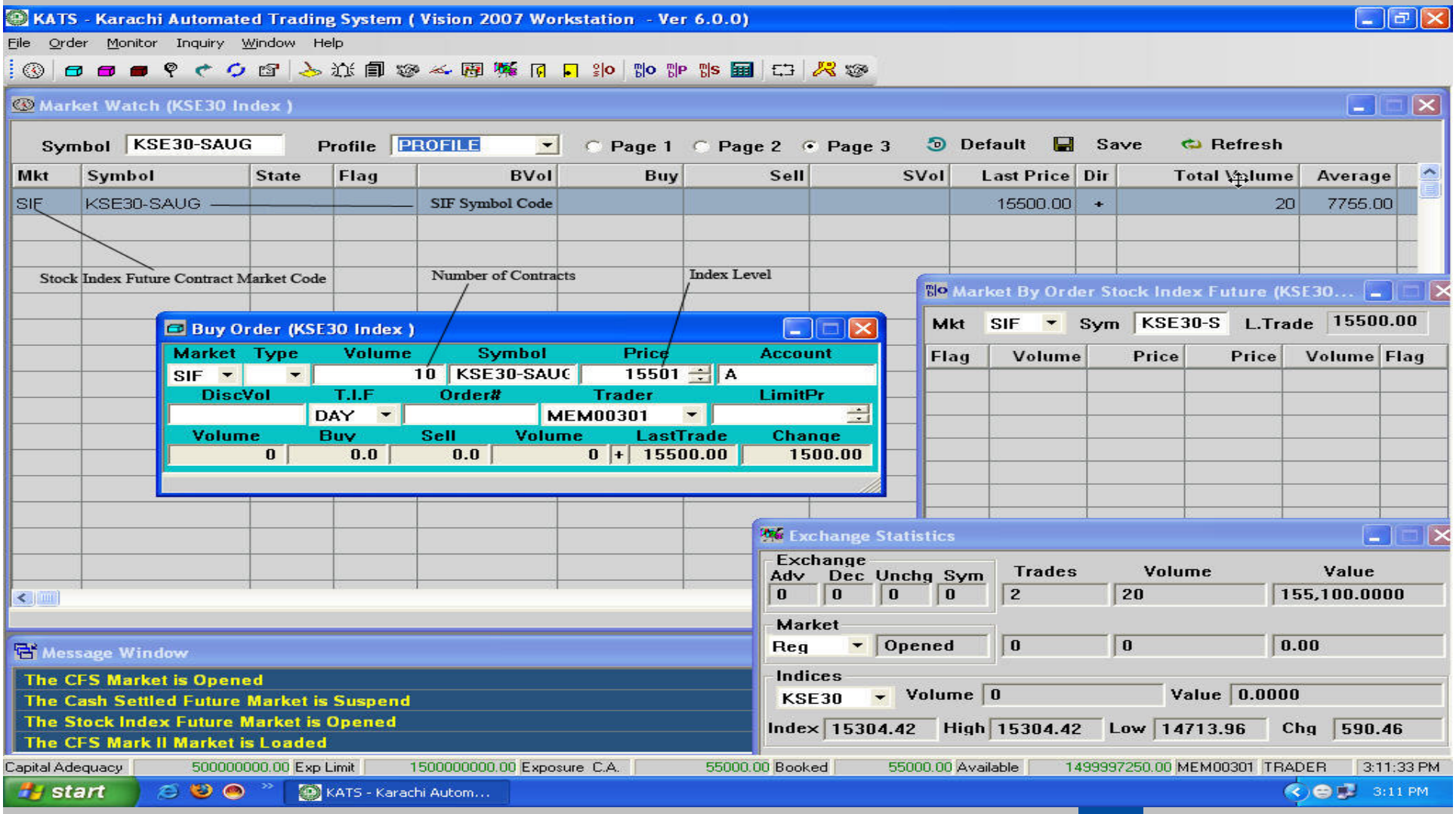
Derivatives – SIFC (Regulatory Framework)

OPERATING PARAMETER	OPERATING VALUE
TRADING PLATFORM	KATS
INITIAL DEPOSIT	SECP 500,000 KSE 250,000/=
MARGINS	PRE-TRADE 5%, SECP PROPOSES 12.5 % flat, KSE Proposes fix 7.5%
Mark-to-Market	UIN based, Settled on T+0 Basis
Daily Settlement Price	Vol-weighted AVG of last 30 MIN
Circuit Breakers	NIL
MARGIN DEPOSITS	60% in Cash, 40% in Securities

Derivatives – SIFC (Regulatory Framework)

OPERATING PARAMETER	OPERATING VALUE
Open Interest Per UIN	1% Or 1000 Contracts Whichever Is Higher
Open Interest Broker	Within The Limit Of 15 Times Of Capital Adequacy, Fixed For Leverage Counter
Final Settlement Price	Volume Weighted Average Of Underlying Index For Last Hours

Derivatives – SIFC Trading Interface



" Although the benefits and costs of derivatives remain the subject of spirited debate, the performance of the economy and the financial system in recent years suggests that those benefits have materially exceeded the costs."

Alan Greenspan

"We view them as time bombs both for the parties that deal in them and the economic system. In our view derivatives are financial weapons of mass destruction(WMD), carrying dangers that, while now latent, are potentially lethal."

Warren Buffet

Options

Derivatives - Options

- An Option is a right, but not an obligation, to buy or sell, a specified amount of an underlying asset, at an agreed upon price, on or before a specified date

- The KSE has circulated for comments, draft rules pertaining to the introduction of 'options' on individual stocks. However, so far no decisions have been made as regards the 'option writers'.

Derivatives - Benefits of Options

- Ability to take positions at other than current market levels

✓ Options available in-the-money, at-the-money and out-of-the-money
✓ Futures and forward contracts available only at current market (i.e. at-the-money)

- Leverage

✓ Full participation in gains with small initial outlay
✓ No margin required for buyers
✓ Margin is required for writers
✓ Futures contracts subject to margin requirement

Derivatives - Options Basic Components

- Types of Options
  - ✓ Call- Right to BUY a specified amount of underlying asset
  - ✓ Put- Right to SELL a specified amount of the underlying asset
- Underlying Asset
  - ✓ This is the asset which the Option Buyer has the right to buy or sell- Bonds, Foreign Exchange, Futures Contracts
- Strike Price or Exercise Price
  - ✓ This is the price at which the underlying asset can be bought or sold
- Premium
  - ✓ This is the cost of the Option- the amount (fee) paid by the Option buyer to the Option seller

Derivatives - Options Basic Components

- Time to Expiration or Maturity

  ✓ This is the amount of time remaining that the Option buyer has the right to exercise the option.

- There are two types of options:

  ✓ European Option- The Option buyer has the right to exercise only on the maturity date

  ✓ American Option- The Option buyer has the right to exercise at any time on or before the maturity date

Derivatives - Options Basic Components

- **Option Buying and Writing**

  - ✓ An option contract gives the buyer of the option the right to require the writer of the option to perform according to the stated provisions of the contract

  - ✓ Buyer- Pays a fee, or premium, to obtain this right, and has a long position in the option

  - ✓ Writer (Seller)- Receives the premium in return for granting the option, and has a short position in the option

Swaps

Derivatives - Swaps

- Traditionally, the exchange of one security for another to change the maturity (bonds), quality of issues (stocks or bonds), or because investment objectives have changed. Swaps have grown to include currency swaps and interest rate swaps.

Derivatives - Types of Swap Transactions

- Pure Swap - Purchase and sale of the same currency for different value dates with the same counter-party.

- Engineered Swap - Purchase and sale of the same currency the different value dates but with different counter-parties.

Derivatives – Interest rate Swap

- **Interest rate Swap**

✓ An interest rate swap is a derivative in which one party exchanges a stream of interest payments for another party's stream of cash flows. Interest rate swaps can be used by hedgers to manage their fixed or floating assets and liabilities

✓ They can also be used by speculators to replicate unfunded bond exposures to profit from changes in interest rates.

✓ Interest rate swaps are very popular and highly liquid instruments.

✓ ISDA represents participant in the privately negotiated derivatives industry and is the largest global financial trade association, by number of member firms.

✓ Since its inception, ISDA has pioneered efforts to identify and reduce the sources of risk in the derivatives and risk management business. Among its most notable accomplishments are: developing the ISDA Master Agreement; publishing a wide range of related documentation materials and instruments covering a variety of transaction types; producing legal opinions on the enforceability of netting and collateral arrangements (available only to ISDA members);

Derivatives – Interest rate Swap Structure

- In an interest rate swap, each counterparty agrees to pay either a fixed or floating rate denominated in a particular currency to the other counterparty. The fixed or floating rate is multiplied by a notional principal amount (say, USD 1 million). This notional amount is generally not exchanged between counterparties, but is used only for calculating the size of cash flows to be exchanged
- The most common interest rate swap is one where one counterparty A pays a fixed rate (the swap rate) to counterparty B, while receiving a floating rate (usually pegged to a reference rate such as LIBOR)

✓ A pays fixed rate to B (A receives variable rate)

✓ B pays variable rate to A (B receives fixed rate)

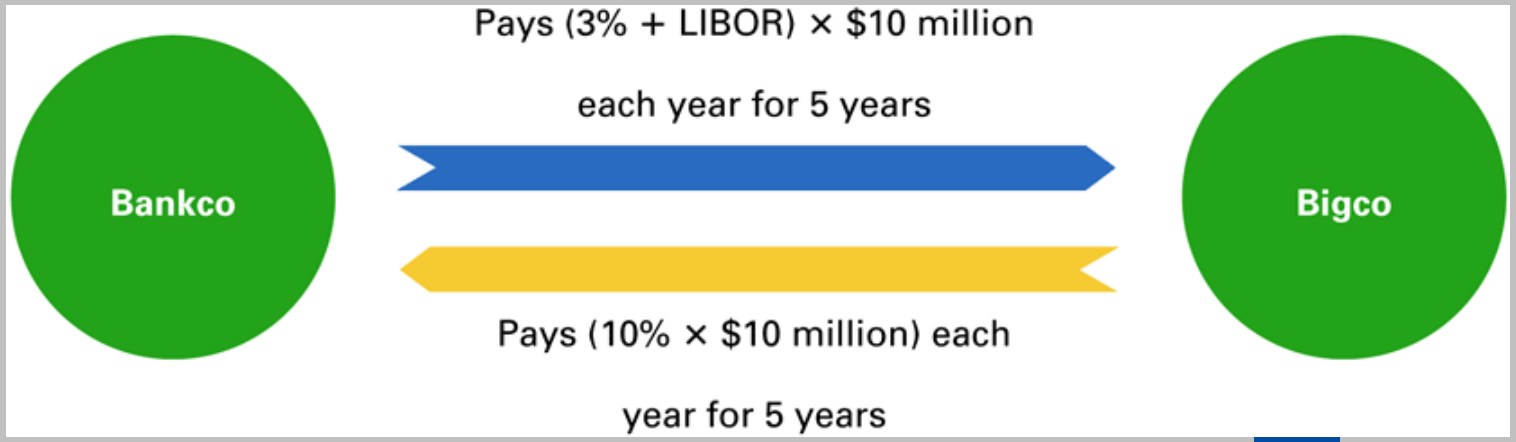
Derivatives – Interest rate Swap Structure

- Consider the following swap in which Party A agrees to pay Party B periodic fixed interest rate payments of 3.00%, in exchange for periodic variable interest rate payments of LIBOR + 50 bps (0.50%). Note that there is no exchange of the principal amounts and that the interest rates are on a "notional" (i.e. imaginary) principal amount. Also note that the interest payments are settled in net (e.g. if LIBOR is 1.30% then Party B receives 1.20% (3.00% - (LIBOR + 50 bps)) and Party A pays 1.20%). The fixed rate (3.00% in this example) is referred to as the swap rate
- At the point of initiation of the swap, the swap is priced so that it has a net present value of zero. If one party wants to pay 50 bps above the par swap rate, the other party has to pay approximately 50 bps over LIBOR to compensate for this.

Derivatives – Types of Interest rate Swap

- Fixed-for-floating rate swap, same currency

✓ Fixed-for-floating swaps in same currency are used to convert a fixed rate asset/liability to a floating rate asset/liability or vice versa. For example, if a company has a fixed rate USD 10 million loan at 5.3% paid monthly and a floating rate investment of USD 10 million that returns USD 1M Libor +25 bps monthly, it may enter into a fixed-for-floating swap. In this swap, the company would pay a floating USD 1M Libor+25 bps and receive a 5.5% fixed rate, locking in 20bps profit. The following is a graphical illustration of fixed for floating rate swap



Derivatives – Types of Interest rate Swap

- Fixed-for-floating rate swap - different currencies

✓ Fixed-for-floating swaps in different currencies are used to convert a fixed rate asset/liability in one currency to a floating rate asset/liability in a different currency, or vice versa. For example, if a company has a fixed rate USD 10 million loan at 5.3% p.a., paid monthly and a floating rate investment of JPY 1.2 billion that returns JPY 1M Libor +50 bps monthly, and wants to lock in the profit in USD as they expect the JPY 1M Libor to go down or USDJPY to go up (JPY depreciate against USD), then they may enter into a Fixed-Floating swap in different currency where the company pays floating JPY 1M Libor+50 bps and receives 5.6% fixed rate, locking in 30bps profit against the interest rate and the fx exposure

Derivatives – Types of Interest rate Swap

- Floating-for-floating rate swap - same currency

✓ Floating-for-floating rate swaps are used to hedge against or speculate on the spread between the two indexes widening or narrowing. For example, if a company has a floating rate loan at JPY 1M LIBOR and the company has an investment that returns JPY 1M TIBOR + 30 bps and currently the JPY 1M TIBOR = JPY 1M LIBOR + 10bps. At the moment, this company has a net profit of 40 bps

Derivatives – Types of Interest rate Swap

- Floating-for-floating rate swap, different currencies

✓ Party P pays/receives floating interest in currency A indexed to X to receive/pay floating rate in currency B indexed to Y on a notional N at an initial exchange rate of FX for a tenure of T years. For example, you pay floating USD 1M LIBOR on the USD notional 10 million quarterly to receive JPY 3M TIBOR monthly on a JPY notional 1.2 billion (at an initial exchange rate of USDJPY 120) for 4 years

Derivatives – Currency Swap

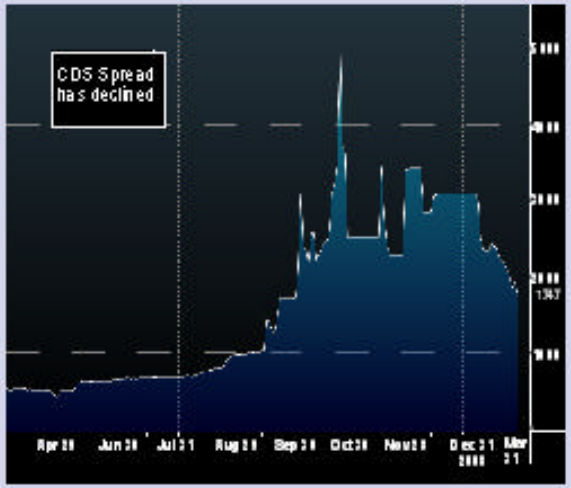
- A currency swap (or cross currency swap) is a foreign exchange agreement between two parties to exchange principal and fixed rate interest payments on a loan in one currency for principal and fixed rate interest payments on an equal (regarding net present value) loan in another currency. Currency swaps are motivated by comparative advantage

✓ Unlike interest rate swaps, currency swaps involve the exchange of the principal amount. Interest payments are not netted (as they are in interest rate swaps) because they are denominated in different currencies

Derivatives – Credit Default Swap

- A credit default swap (CDS) is a credit derivative contract between two counterparties. The buyer makes periodic payments to the seller, and in return receives a payoff of an underlying financial instrument defaults.
- CDS contracts have been compared with insurance, because the buyer pays a premium and, in return, receives a sum of money if one of the specified events occur

The YTD decline in CDS spreads on Pakistan Eurobonds is the sharpest internationally



	Current value	31-Dec	YTD
Pakistan	1,747.0	3,425.4	-49.0%
Argentina	3,752.8	3,905.0	-3.9%
Brazil	323.2	298.5	8.3%
China	156.3	188.4	-17.0%
Egypt	464.0	600.0	-22.7%
Hungary	536.1	419.1	27.9%
Iceland	899.6	976.8	-7.9%
Indonesia	575.0	638.3	-9.9%
Kazakhstan	996.3	670.8	48.5%
Philippine	359.6	383.6	-6.3%
Russia	498.4	743.5	-33.0%
Slovakia	120.0	155.0	-22.6%
Thailand	233.5	255.8	-8.7%
Turkey	399.8	411.1	-2.8%
Ukraine	3,824.3	3,091.5	23.7%

Source: Bloomberg

Does Pakistan Really Need Derivatives?

Derivatives - The Pakistan Scenario

- The advantage of the derivatives market is likely to be visible in the ongoing expansion surge being witnessed in the country

- A primary example is the cement industry which under the current phase of expansion has seen notable names enter the derivatives market to facilitate expansion projects

- Lucky Cement, Pakistan's largest cement manufacturer has entered into a combination of interest rate and currency swaps to finance its expansion projects. Under the current interest rate swap the company receives a floating rate equivalent to 6-month T-Bill or KIBOR in exchange for the fixed payment from 7% - 9.3%. Lucky is likely to benefit in an environment which expects interest rates to increase

- Attock Cement has also entered into an interest rate swap arrangement to finance its expansion project. The company receives a fixed mark-up above a floating KIBOR rate against fixed payments

Derivatives – Pakistan's perspective
Case examples

- **Name of Company: Kohinoor Textile Mills Limited**
  - ✓ Nature of Option: Cross Currency Swap (CCS)
  - ✓ Particulars: KTML entered into a CCS of notional amount of PKR 1.852BN for its local currency loans to hedge the possible adverse movement in interest rates.
  - ✓ Under the terms of the agreement KTML pays LIBOR plus Bank spread @ 0.95% to the arranging Bank on the local currency loan denominated in USD for the purpose of CCS and receives KIBOR.
  - ✓ The derivative Cross Currency interest rate swap that are outstanding as at June 30, 2008 have been mark to market and the effective unrealized gain aggregating to PKR 206mn has been recognized in accordance with the provision of IAS 39.

Source: Annual report 2008

Derivatives – Pakistan's perspective
Case examples

- **Name of Company: Gadoon Textile Mills Limited**

✓ Nature of Option: Cross Currency Swap (CCS)

✓ Particulars: The Company has entered into a Cross Currency interest rate swap arrangement amounting to PKR 155mn with banks. Under the arrangement the principal amount is swapped with UD$ component. The Company pay six month US$ LIBOR and receive six month KIBOR minus spread as per the arrangement. Settlements are made on semi-annual basis. The Company has terminated the contracts after the balance sheet date.

Source: Annual report 2008

Derivatives – Pakistan's perspective
Case examples

- **Name of Company: Azgard -9**

✓ Nature of Option: Cross Currency Interest rate swap

✓ Particulars: The Company has entered into a Cross Currency interest rate swap arrangement amounting to PKR 1,500mn with Citibank to cover various short term facilities. The Company is liable to pay interest at 6 months LIBOR.

Source: Annual report 2007

✓ Azgard-9 was one of the first ones to undertake Cross Currency Swap in Pakistan. Azgard–9 benefited to a large extent in the initial years from this arrangement however now due to significant devaluation of PKR this arrangement has exposed them to losses.

Derivatives – Pakistan's perspective
Case examples

- **Name of Company: Standard Chartered Bank Pakistan Ltd**

✓ Nature of Option: Interest rate and Currency Swap

✓ Particulars: The Bank made an income of PKR 13.713 bn in CY08, out of this PKR 1.05bn is through income on interest rate swap and other derivatives.

Source: Annual report 2008

Derivatives – Pakistan's perspective
Case examples

- **Name of Company: Royal Bank of Scotland**

✓ Nature of Option: Interest rate and Currency Swap

✓ Particulars: The Bank made an income of PKR 6.00 bn in CY08, out of this PKR 1.22bn is through income on interest rate swap and other derivatives.

Source: Annual report 2008

Derivatives – Pakistan's perspective
Case examples

- **AKD Securities Limited Vs Counterparty**

✓ **Structure 1**

➢ AKDS has offered a European put option and half call option (collar arrangement) to a Counterparty whereby AKDS will bear all the loss incurred on the proposed investment as the counterparty shall exercise put option and gain made on the investment is shared in the ratio of 50:50 as AKDS and the counterparty shall exercise their respective call option. In case of loss the counterparty has the right to exercise the put option and square off the position and retrieve its invested amount i.e. principal amount

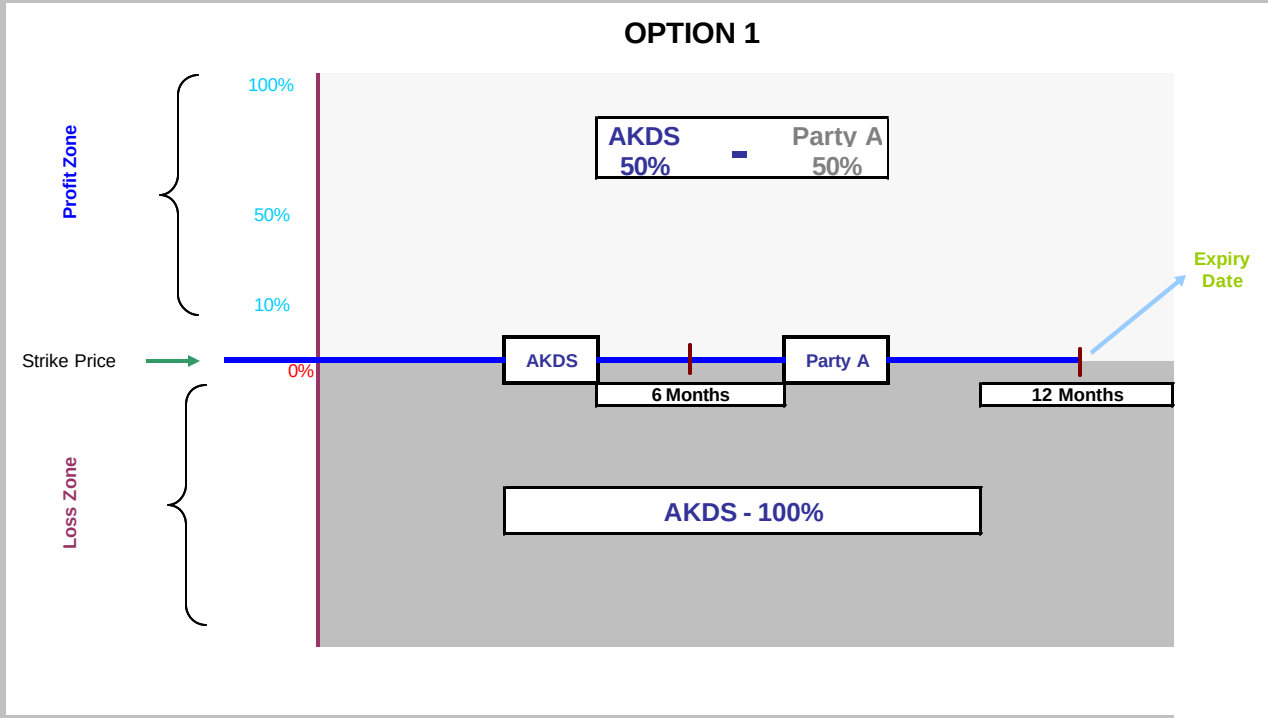
✓ **Structure 2**

➢ AKDS has offered a European put option and 1/5 Call option (collar arrangement) to a Counterparty whereby AKDS will bear all the loss incurred on the proposed investment and will also bear borrowing cost of the counterparty as counterparty will exercise the put option incase the value of the portfolio falls below exercise price= principal + interest and gain made on the investment is shared in the ratio of 80:20. In case of loss the counterparty has the right to exercise the put option and square off the position and retrieve its invested amount along with the ac borrowing cost i.e. principal + interest cost

Derivatives – Pakistan's perspective
Case examples

- **AKD Securities Limited Vs Counterparty**

✓ **Structure 1**

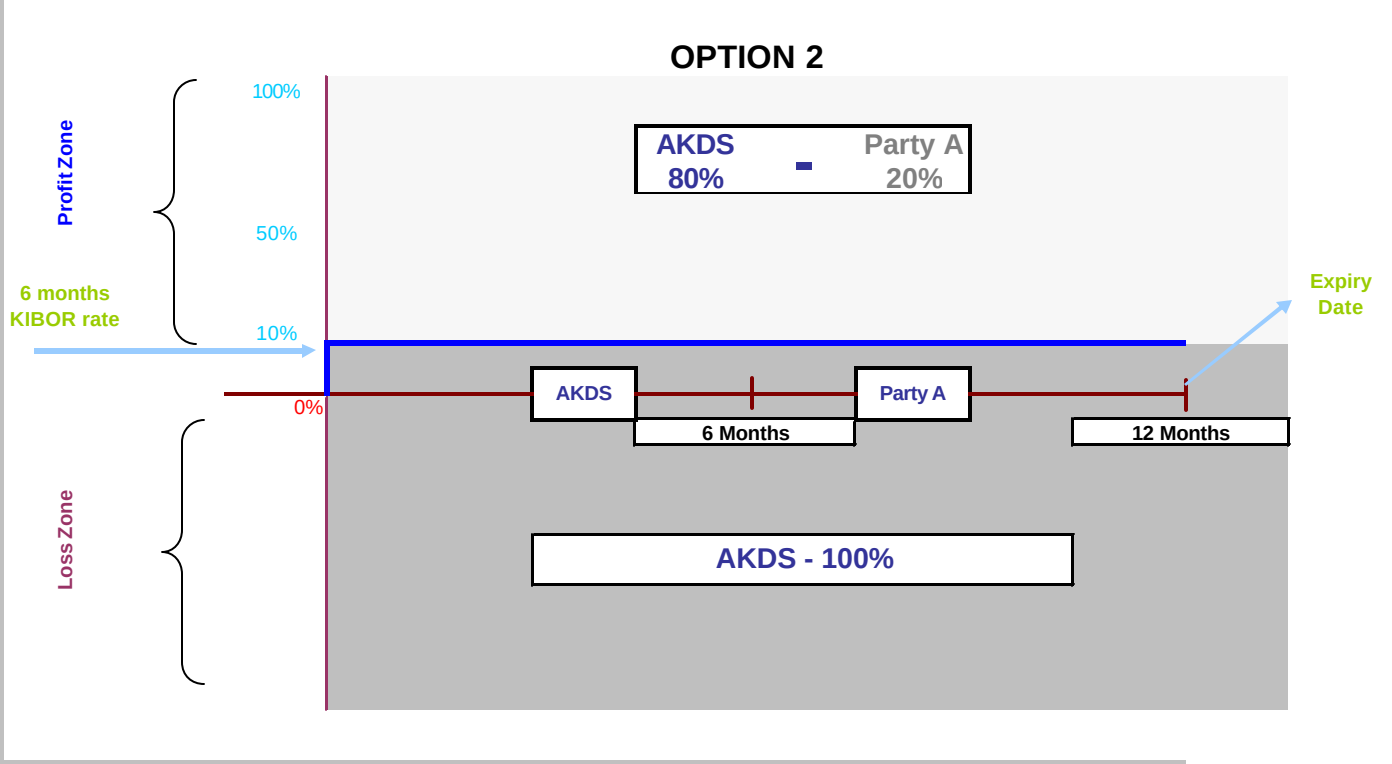


Under this scenario the party will share the profit with AKD equally. However, it is not liable for any losses since in such a situation the party's put option will be in-the-money

Derivatives – Pakistan's perspective
Case examples

- **AKD Securities Limited Vs Counterparty**

✓ **Structure 2**



Under this scenario the party's investment will be treated as a plain vanilla lending at a mark-up rate equally to the actually borrowing cost of the party. An additional feature of the facility will be a 20% sharing in the potential profits.

Islamic Derivatives

Insight into Islamic Derivatives
Requisites for a Shariah Compliant Derivative Instrument

- All Islamic financial instruments in general must meet a number of criteria in order to be considered halal (acceptable).
- At a primary level all financial instruments and transactions must be free of at least the following five items: (i) riba (usury), (ii) rishwah (corruption), (iii) maysir (gambling), (iv) gharar (unnecessary risk) and (v) jahl (ignorance).
- Riba can be in different forms and is prohibited in all its forms. For example, Riba can also occur when one gets a positive return without taking any risk.
- As for gharar, there appears to be no consensus on what gharar means. It has been taken to mean, unnecessary risk, deception or intentionally induced uncertainty.
- In the context of financial transactions, gharar could be thought of as looseness of the underlying contract such that one or both parties are uncertain about possible outcomes.
- Masyir from a financial instrument viewpoint would be one where the outcome is purely dependent on chance alone – as in gambling.
- Finally, jahl refers to ignorance. From a financial transaction viewpoint, it would be unacceptable if one party to the transaction gains because of the other party's ignorance.

Insight into Islamic Derivatives
Requisites for a Shariah Compliant Derivative Instrument

- In addition to these requirements for financial instruments, the shariah has some basic conditions with regards to the sale of an asset (in this case a real asset as opposed to financial assets).

- According to the shariah for a sale to be valid, (a) the commodity or underlying asset must currently exist in its physical sellable form and (b) the seller should have legal ownership of the asset in its final form.

- These conditions for the validity of a sale would obviously render impossible the trading of derivatives.

- However, the shariah provides exceptions to these general principles to enable deferred sale where needed.

Insight into Islamic Derivatives
Future Contract and Islamic Finance

- A number of instruments/contracts exist in Islamic finance that could be considered a basis for forward/futures contracts within an Islamic framework.

- We will examine three such contracts. These are (i) the Salam Contract, (ii) the Istisna Contract and (iii) Joa'la Contract.

- Each of these contracts concern deferred transactions, and would be applicable for different situations. The first and probably the most relevant of these to modern day forward/futures contracts would be the Salam Contract or Ba'i Salam.

Insight into Islamic Derivatives
Ba'i Salam

- Salam is essentially a transaction where two parties agree to carry out a sale/purchase of an underlying asset at a predetermined future date but at a price determined and fully paid for today

- This is similar to a conventional forward contract however, the big difference is that in a Salam sale, the buyer pays the entire amount in full at the time the contract is initiated. The contract also stipulates that the payment must be in cash form.

- The idea behind such a 'prepayment' requirement has to do with the fact that the objective in a Ba'i Salam contract is to help needy farmers and small businesses with working capital financing.

- Since there is full prepayment, a Salam sale is clearly beneficial to the seller. As such, the predetermined price is normally lower than the prevailing spot price.

- This price behavior is certainly different from that of conventional futures contracts where the futures price is typically higher than the spot price by the amount of the carrying cost.

Insight into Islamic Derivatives
Ba'i Salam

- The lower Salam price compared to spot is the "compensation" by the seller to the buyer for the privilege given him.

- Despite allowing Salam sale, Salam is still an exception within the Islamic financial system which generally discourages forward sales, particularly of foodstuff.

- Thus, Ba'i Salam is subject to several conditions:

  ✓ Full payment by buyer at the time of effecting sale.

  ✓ The underlying asset must be standardized, easily quantifiable and of determinate quality.

  ✓ Cannot be based on an uniquely identified underlying.

  ✓ Quantity, Quality, Maturity date and Place of delivery must be clearly enumerated.

Insight into Islamic Derivatives
Ba'i Salam

- It should be clear that current exchange traded futures would conform to these conditions with the exception of the first, which requires full advance payment by the buyer.

- Given the customized nature of Ba'i Salam, it would more closely resemble forwards rather than futures. Thus, some of the problems of forwards; namely "double-coincidence", negotiated price and counterparty risk can exist in the Salam sale.

- Counterparty risk however would be one sided. Since the buyer has paid in full, it is the buyer who faces the seller's default risk and not both ways as in forwards/futures.

- In order to overcome the potential for default on the part of the seller, the shariah allows for the buyer to require security which may be in the form of a guarantee or mortgage.

Insight into Islamic Derivatives
Istisna and Joala Contracts

- In addition to Ba'i Salam , there are two other contracts where a transaction is made on a "yet to" exist underlying assets.
- These are the Istisna and Joala contracts.
- The Istisna Contract has as its underlying, a product to be manufactured.
- Essentially, in an Istisna, a buyer contracts with a manufacturer to manufacture a needed product to his specifications.
- The price for the product is agreed upon and fixed. While the agreement may be cancelled by either party before production begins, it cannot be cancelled unilaterally once the manufacturer begins production.
- Unlike the Salam Contract, the payment here is not made in advance. The time of delivery too is not fixed.
- Like Ba'i Salam, a parallel contract is often allowed for in Istisna.
- The Joala Contract is essentially a Istisna but applicable for services as opposed to a manufactured product.

Insight into Islamic Derivatives
The Bai'bil-wafa & Bai 'bil Istighlal Contracts

- The Bail bil-wafa is a composite of bai (sale) and rahnu (pledge).
- Under this contract, one party sells an asset to a buyer who pledges to sell back the asset to the original owner at a predetermined future date.
- The rahnu (pledge) being to sell back to the owner and not to a third party.
- Looks like a REPO? Except that the resale price must be the same as the original purchase price.
- But like a REPO, the buyer has rights to benefits from ownership of the asset.
- The Bai bil-Istighlal is really a combination of the Bai wafa and Ijarah.
- Under this contract, the buyer not only promises to resell at a predetermined future price but to also lease the asset to the seller in the interim period.
- The Bai bil-Istighlal can therefore be a convenient means by which an IB can provide short/medium term financing. The IB first purchases the asset, leases it the customer before finally reselling it to the customer.

Insight into Islamic Derivatives
Options in Islamic Finance

- Recall our earlier argument that to be acceptable an instrument/investment must be free of gharar and not have zero risk in order to provide some positive return.

- The Istijrar Contract is a recently introduced Islamic financing instrument. The contract has embedded options that could be triggered if an underlying asset's price exceeds certain bounds.

- The contract is complex in that it constitutes a combination of options, average prices and Murabaha or cost plus financing

Insight into Islamic Derivatives
Overview of Istijrar

- The Istijrar involves two parties, a buyer which could be a company seeking financing to purchase the underlying asset and a financial institution.

- A typical Istijrar transaction could be as follows; a company seeking short term working capital to finance the purchase of a commodity like a needed raw material approaches a bank. The bank purchases the commodity at the current price (Po), and resells it to the company for payment to be made at a mutually agreed upon date in the future – for example in 3 months. The price at which settlement occurs on maturity is contingent on the underlying asset's price movement from t0 to t90. Where t0 is the day the contract was initiated and t90 is the 90th day which would be the maturity day.

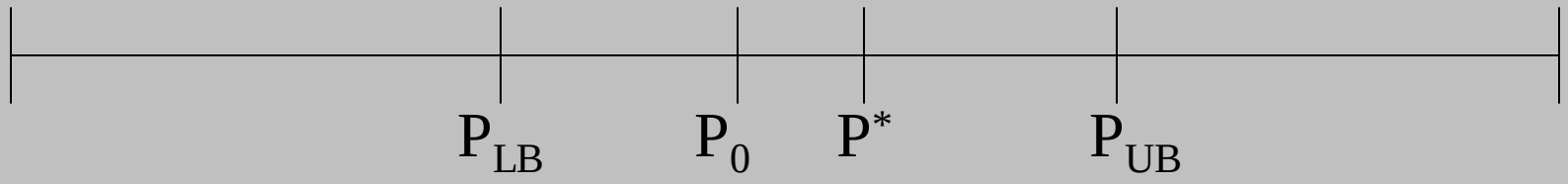
- Unlike a Murabaha contract where the settlement price would simply be a predetermined price; P* where P* = Po (1+r), with 'r' being the bank's required return/earning, the price at which the Istijrar is settled on maturity date could either be P* or an average price ( ) of the commodity between the period t0 an t90.

Insight into Islamic Derivatives
Overview of Istijrar

- As to which of the two prices will be used for settlement will depend on how prices have behaved and which party chooses to "fix" the settlement price. The embedded option is the right to choose to fix the price at which settlement will occur at anytime before contract maturity.

- At the initiation of the contract; to, both parties agree on the following two items (i) in the predetermined Murabaha price; P* and (ii) an upper and lower bound around the Po. (bank's purchase price at t0).

Insight into Islamic Derivatives
Overview of Istijrar



where Po= The price that bank pays to purchase underlying commodity.
P* = Murabaha price; P* = Po (1+r).
PLB = The lower bound price
PUB = The Upper bound price

The settlement price (Ps) at t90 would be;

(i) Ps = if the underlying asset price remained within the bounds.

or

(ii) Ps = P*; if the underlying asset exceeds the bounds and one of the parties chooses to exercise its option and use P* as the price at which to settle at maturity.

Insight into Islamic Derivatives
Overview of Istijrar

- The basic idea behind such a contract is to spread out the benefits of favourable price movement to both parties. – i.e. Not a zero sum game.

- Such a contract fulfills the need to avoid a fixed return on a riskless asset which would be considered "riba" and also avoids gharar in that both parties know up front, P* and the range of other possible prices. (by definition between the upper and lower bounds).

The Istijrar from an Options Viewpoint

- Given our description of the Istijrar Contract, the contract comes across as something that is the result of modern day financial engineering.

- Many of the products of financial engineering tend to have the complexities, bounds, trigger points etc. similar to that of the Istijrar.

Derivatives

Opportunity or Threat?

The charge sheet

- The argument against derivatives is straightforward
- ✓ Derivatives are said to be inherently complex and difficult to understand
- ✓ From which it follows that the parties buying and selling them don't really understand the risks that they are taking
- ✓ In other words derivatives encourage firms to take on too much risk
- ✓ Sophisticated finance was blamed for causing the East Asian crisis of the 1990s
- ✓ US Derivatives are being blamed for the current Sub prime Crisis

Derivatives – International perspective

$1 Quadrillion of Unregulated Debt At Core of Coming Derivatives Crisis

Despite all the blather and swearing-on-the-Bible pronunciamentos from establishment "pundits," our house-of-cards financial system is not fundamentally sound. Expect such indices ***(By John Tiffany)***

Derivatives – International Perspective
Causes of East Asia Crisis

- *Causes of the East Asia Crisis*

✓ *The exceptionally high leverage ratios were dangerous in and of themselves*

✓ *If the profitability faltered there was little cushion to fall back on*

✓ *Firms worsened the situation by funding this leverage in dangerous ways*

✓ *They incurred two types of debt mismatches*

- *Borrowed domestically at short term rates to finance long term projects*
- *Borrowed abroad in foreign currency without hedging*

Derivatives – International Perspective
Causes of East Asia Crisis

- The Crisis breaks

✓ In 1996 profitability turned down

✓ By 1997 foreign lenders became worried so they demanded repayment

✓ Exchange rates consequently depreciated and interest rates soared, pushing many of the Asia's Corporates into bankruptcy

- Where was the Risk Management

✓ In other words Crisis was not caused because of inappropriate use of risk management tools (e.g. derivatives)

✓ It was caused precisely because firms incurred very large risks and then did not use any tools to manage them!

Derivatives – International perspective
Causes of Sub Prime

- Speculation

✓ Speculation in residential real estate has been a major contributing factor. A record level of nearly 40% of homes purchases in 2006 were not intended as primary residences.

- Inaccurate credit ratings

✓ Credit rating agencies are now under scrutiny for having given investment-grade ratings to CDOs and MBSs based on subprime mortgage loans. As there are indications that some involved in rating subprime-related securities knew at the time that the rating process was faulty.

- High-risk mortgage loans and lending/borrowing practices

✓ The behavior of lenders changed dramatically. Lenders offered more and more loans to higher-risk borrowers, including illegal immigrants. Subprime mortgages amounted to $35 billion (5% of total originations) in $160 billion (13%) in 1999, and $600 billion (20%) in 2006.

Derivatives – International perspective
Causes of Sub Prime

- Policies of central banks

✓ A contributing factor to the rise in house prices was the Federal Reserve's lowering of interest rates early in the decade. From 2000 to 2003, the Federal Reserve lowered the federal funds rate target from 6.5% to 1.0%.

- Leverage Ratios of Investment Banks Increased Significantly 2003–2007

✓ Many financial institutions, investment banks in particular, issued large amounts of debt during 2004–2007, and invested the proceeds in mortgage-backed securities (MBS), essentially betting that house prices would continue to rise, and that households would continue to make their mortgage payments. For e.g. Carlyle hedge fund invested US$23 billion on an equity base of less than US$ 1 billion

Derivatives – International perspective

- A key difference between the two examples:

✓ Unlike in East Asia Crisis, derivatives were an important part of the story

✓ Problem originated because banks made loans to sub prime customers, sometimes even to "NINJAs" (those with No Income No jobs and No Assets)

✓ Then they repackaged the loans in Collateralised Debt Obligation (CDOs) and sold them to investors

Derivatives – International perspective

- **CDOs proved troublesome for two reasons:**

✓ **The originate and distribute model gave few incentives for mortgage originators to contain risk**

✓ **Packaging the loans in CDOs made it difficult for buyers to assess their riskiness**

✓ **They relied on rating agencies whose judgment proved fallible**

Derivatives – Case for Derivatives

- There are two sides to derivatives -- one positive and beneficial, one exploitive and negative. Of the latter, the most visible example today comes to us courtesy of the American International Group (AIG)
- The other side of derivatives, however, involves the less-publicized but widespread use of these financial instruments in ways that benefit companies.
- Derivatives have been immensely valuable tools and will be instrumental in providing the liquidity needed to jump-start the economy
- Companies find that over-the-counter derivatives are essential to their day-to-day operations.
- Derivatives help insulate them from risk, which allows them to borrow capital at better prices than they would otherwise.

Derivatives – Case for Derivatives

- And derivatives are more useful than ever in these days of unusual volatility in financial markets.
- The most important benefit of derivatives is that they allow businesses to hedge risks that otherwise could not be hedged.
- Corporate have no doubt incurred huge losses in 2008 but have been benefitting in the past from Interest rate cross currency swaps. A lot many have squared off their positions on account of huge losses, the ones who have carried on are in the money and stand to gain.
- The trouble would be SBP has become conservative in allowing such contracts.
- Our businesses need derivatives. Most of us choose to drive cars even though they sometimes crash. But we also insist that cars are made as safe as it makes economic sense for them to be, and that speed limits and other rules of the road are enforced. The same logic should apply to derivatives.

Thank You