



# Introducing NCEL

# Agenda

- Derivatives
- A Futures Exchange
- NCEL
  - Vision / Mission
  - Business Model
  - Technology
  - Operations
  - Analytics & Risk Management
  - Contract Design
  - NCEL & Agriculture



# Derivatives

# Derivatives

- Introduced in 1972
- Doubling every 3 years
- Extremely low failure rate even if compared to bank lending
- Derivatives are termed as “new technology”
- Common analogy – aircrafts versus cars
- Rates of accident per kilometer are extremely low as compared to road travel
- Trillions of \$s are traded daily

# SIZE, as a percentage of US *GDP* (2004)

## Derivatives, Outstanding

Trillion US\$, notional principal (as percent of U.S. GDP)

	US	GLOBAL
OTC Derivatives	\$84.18* (722%)	\$220.06 (1887%)
Exchange Traded	\$31.06 (266%)	\$52.80 (453%)
Total	\$115.24 (988%)	\$272.86 (2340%)

\* US commercial banks only, broker-dealers and others not reporting

**Global – 23 times the US GDP**

# Derivatives & Infrastructure

## Exchange-Traded Derivatives Products:

- Fixed Income
- Foreign Exchange
- Equity
- Commodity

## Risk Management:

- Analytics for quantifying risk
- Risk based margining

## Clearing & Settlement:

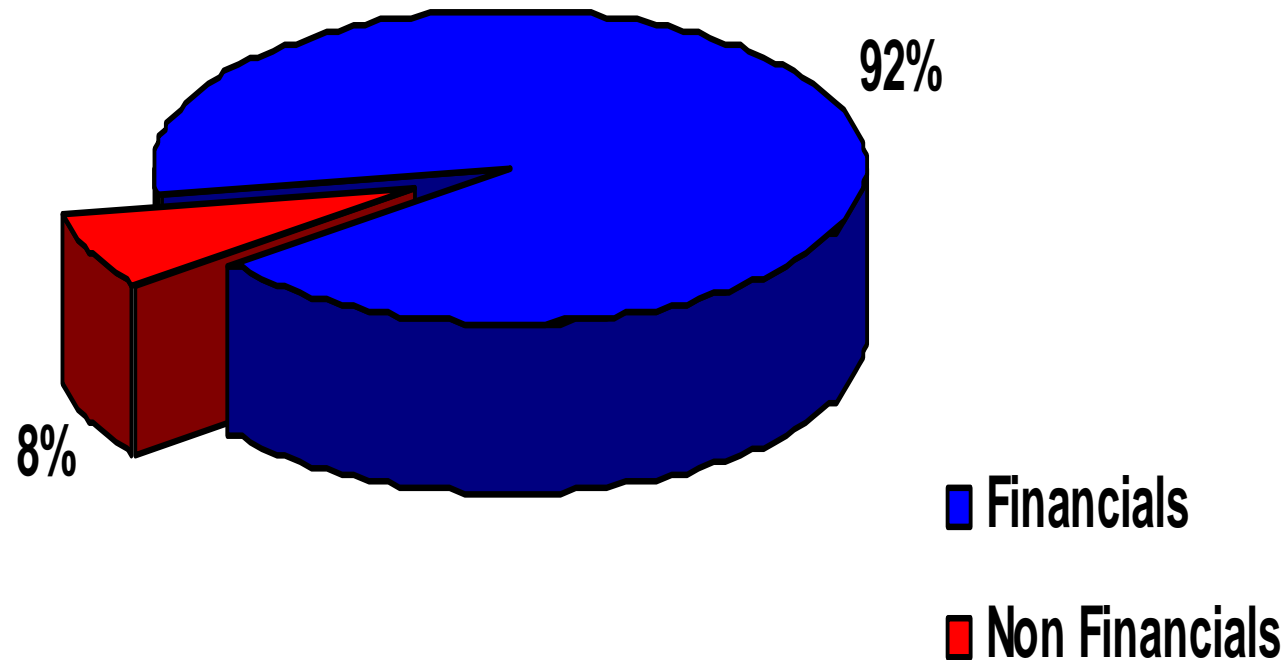
- Novation & CCP
- Guaranteed performance of contracts
- 100% Trading of credit risk free contracts

## Financials vs. Non Financials 2005

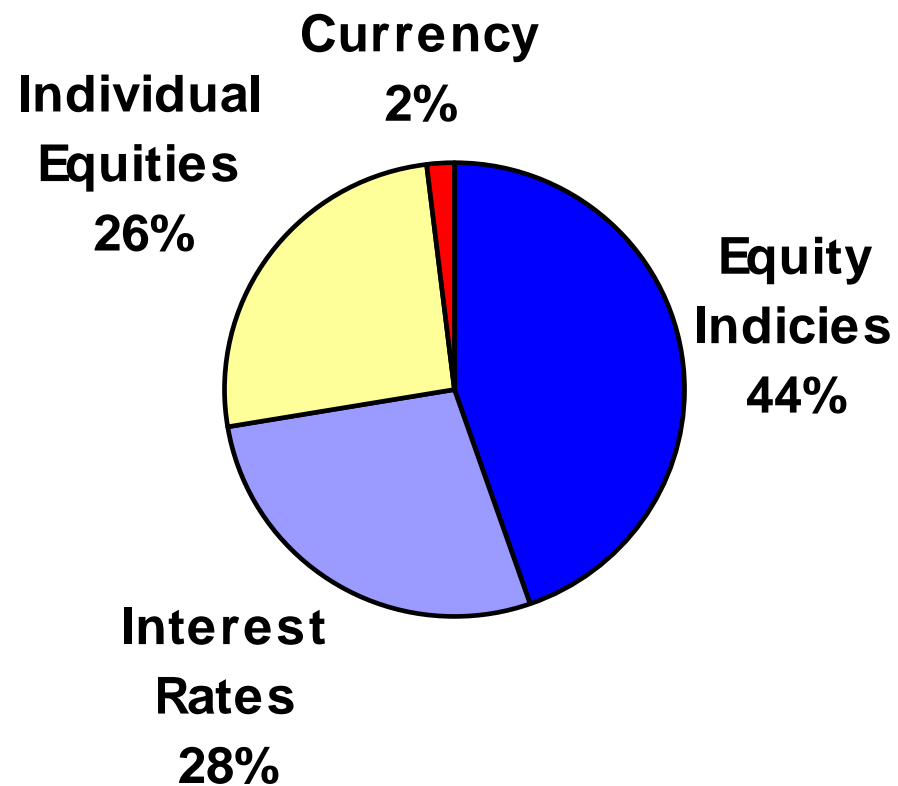
**9.9 billion contracts traded in 2005**

**Financials: 9.1 billion**

**Non-financials: 0.8 billion**

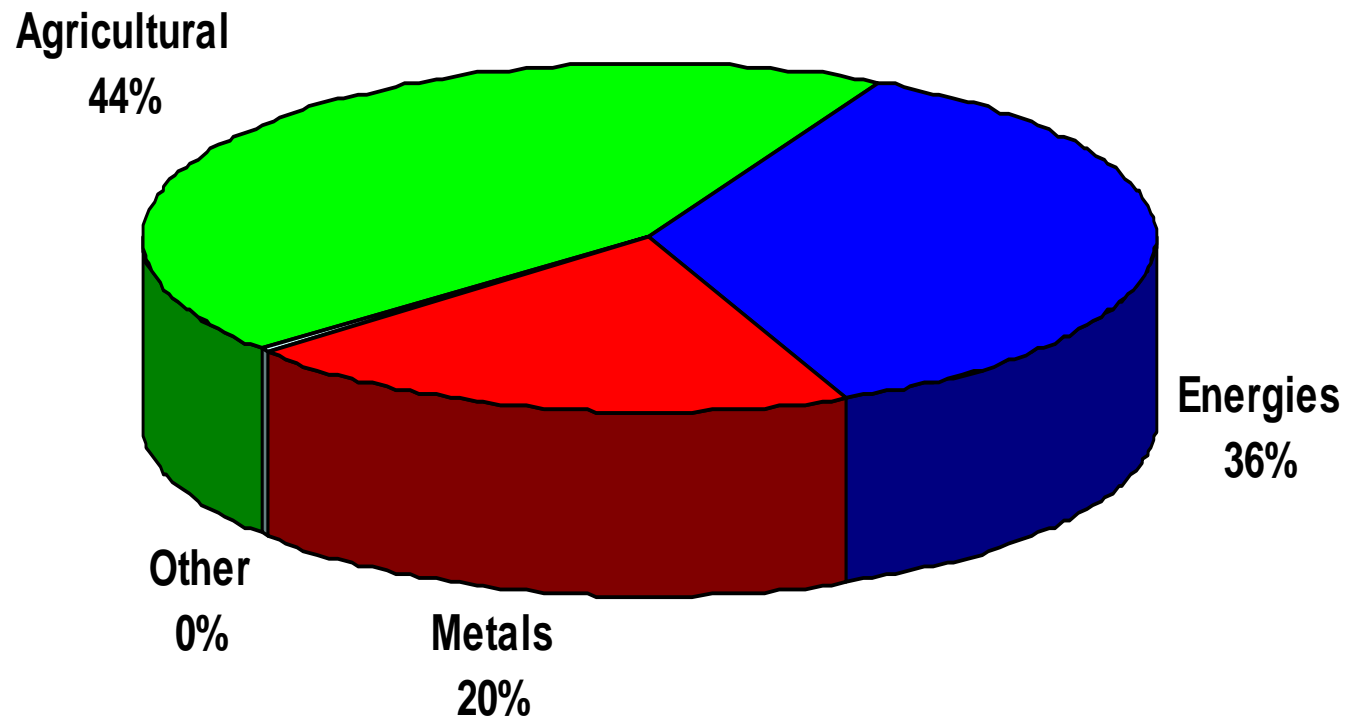


## Global Financials Breakdown 2005





# Global Agricultural, Metal and Energies Breakdown 2005



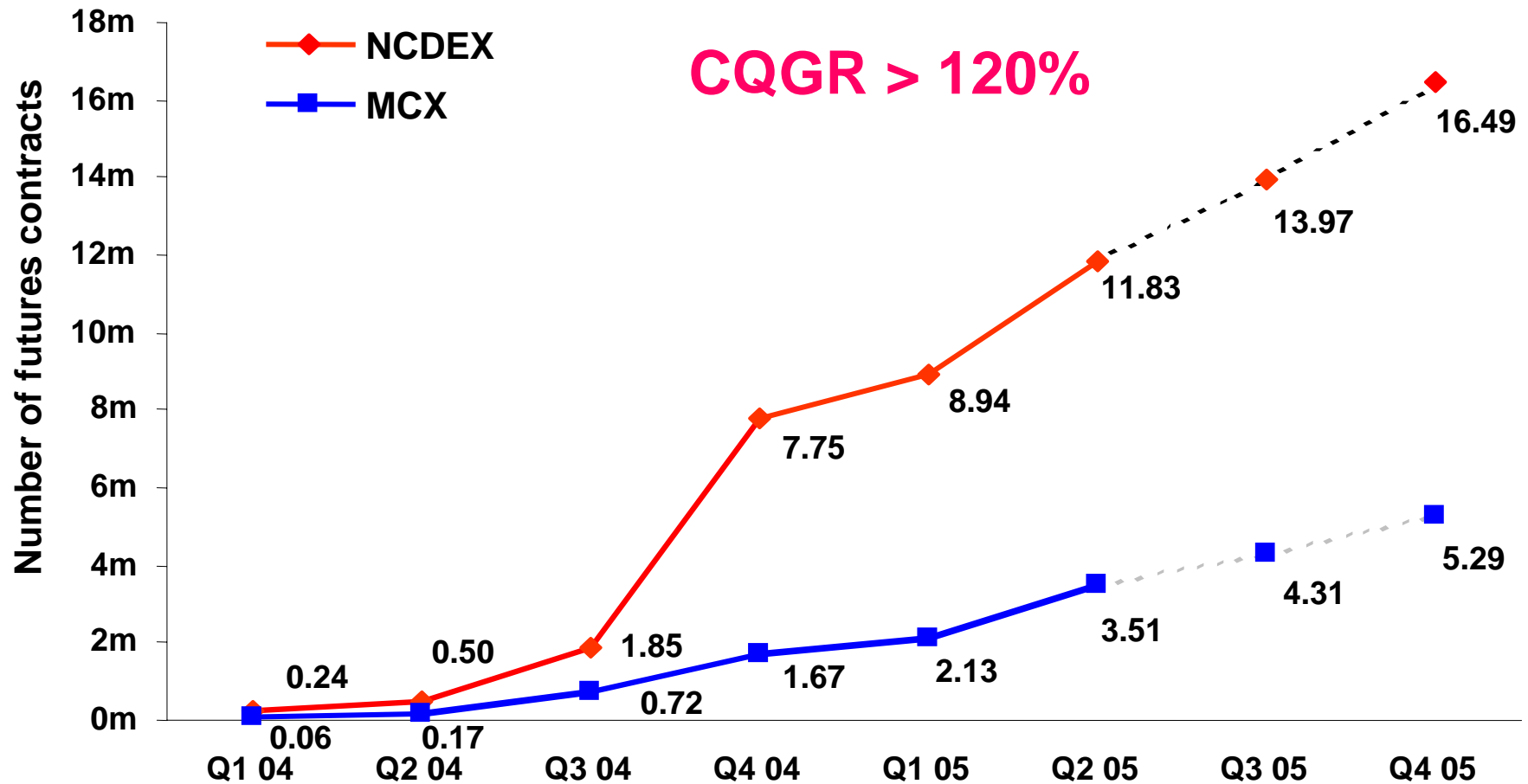
# Global Commodity Exchanges

Continents	No.of Exchange
Africa	7
Asia	32
Australia	1
Europe	15
North America	11
South America	3
<b>Total</b>	<b>69</b>

# Growth of Commodity Exchanges

- Three new commodity exchanges in India - 2004
  - NCDEX is the sixth largest in the world within 2 years of its operations
- MCX to launch cotton yarn contract
- Two commodity exchanges in Iran and third will be opening in 2006
- Dubai Gold and Commodity Exchange launched in November 2005
  - To launch cotton and rice futures in Q3 2006
- Dubai Mercantile Exchange being launched in Q3 2006 – Crude Oil, Oil Products and Metals

# Growth of India's Commodity Exchanges



Source: Exchange data; projections made on the basis of compound quarterly growth rates during period Q1 2004 to Q2 2005



# A Futures Exchange

# Role of a Futures Exchange

- Futures Exchange:
  - A regulated and an orderly marketplace where buyers and sellers express their **collective future expectations**
  - Guarantees performance of contracts
  - Disseminates prices
  - Provides liquidity and depth through centralization
  - Educates Investors

**Exchange is only a thermometer of the price movements and is not responsible for the price movements**

# Participants – Symmetric Risk

- Natural Longs
  - Who produce (issuers)
- Natural shorts
  - Who process or consume (investors)
- Speculators
  - Who provide depth and efficient price discovery
- Arbitrageurs
  - Who provide stability by capitalizing on mispricing between the two markets

# Spot and Futures Markets

- Two distinct and separate markets
  - Spot Market
  - Futures Market
- The two markets interact to provide price signals
- The linkage between the two markets provides price stability
- The existence of a futures market stabilizes today's prices





# NCEL Vision/Mission

# Vision/Mission

## FROM

- Price distortions
- Wide spreads or one way quotes
- Lack of storage
- Absence of standardization
- Counterparty risk
- Impediments in financing
- Price manipulation

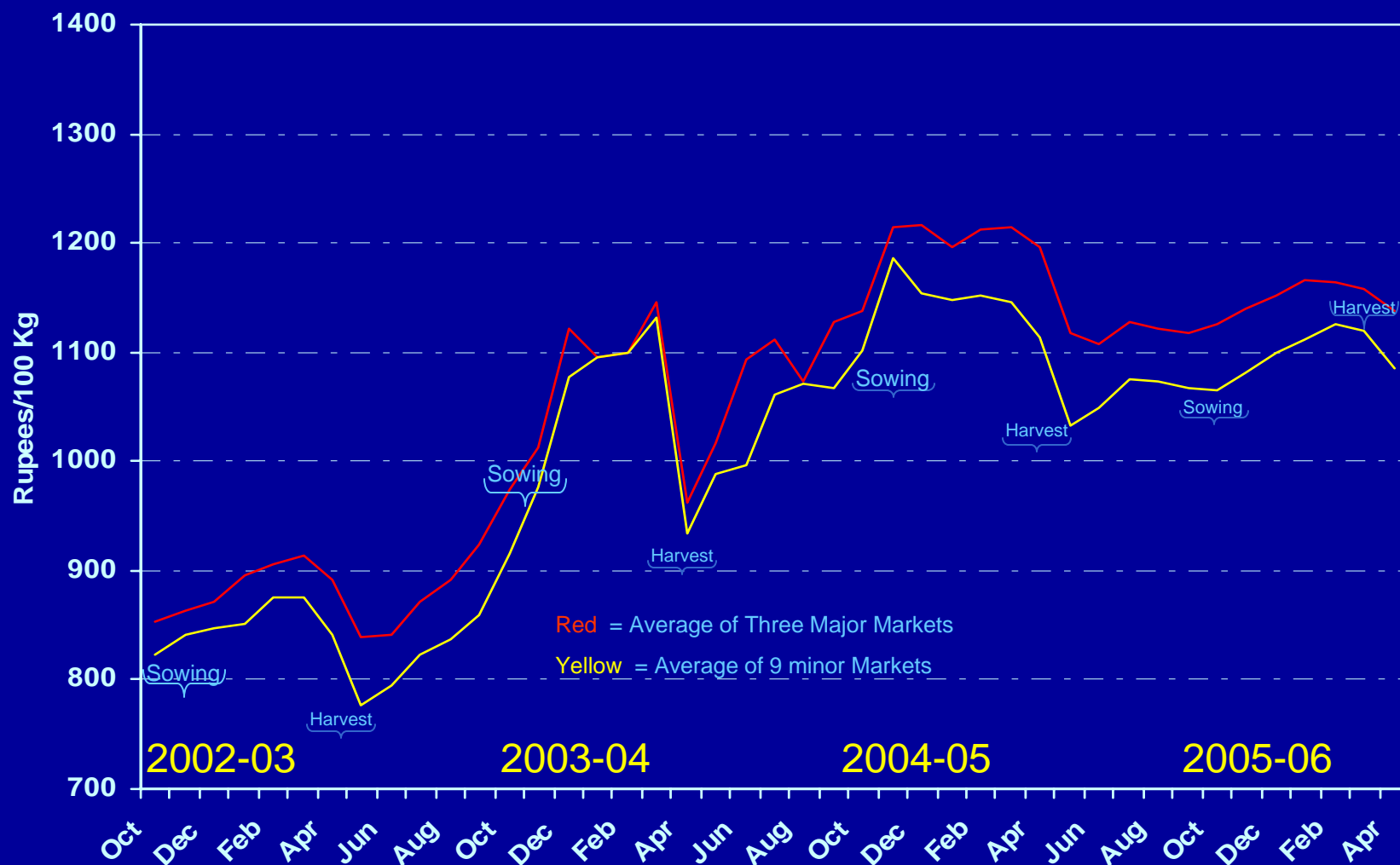
## TO

- Observable prices
- Narrow spreads and two way quotes
- State of the art warehousing
- Quality certification & standardization
- Complete risk mitigation
- Ease in financing
- Price dissemination

**“To provide an opportunity to the farmers to farm for the market”**

# Wheat Price Comparison between Major & Minor Pakistani Markets

## (For Four Years)



Source: Federal Bureau of Statistics & Agri. Marketing Deptt.



# NCEL Business Model

# Basis of NCEL's Business Model

- What are the ills in our market?
  - Benami accounts
  - Only, broker level surveillance
  - Very narrow base
  - High volatility due to excessive leverage
  - Value based margining
  - Broker capital adequacy based on solvency criteria
  - 'Check is in the mail' syndrome
  - Misuse of collateral

# NCEL Highlights

- **First** partially demutualized exchange
- **First** all-electronic exchange of Pakistan
- **First** to introduce client level identification
- **First** to provide complete segregation between broker/client and client/clients
- **First** to introduce risk based gross margining
- **First** to integrate online banking with trading
- **First** to undertake client level surveillance

**Recent happenings highlights the strengths of NCEL's business model**

# NCEL Business Model

**Business Drivers**

**Implications**

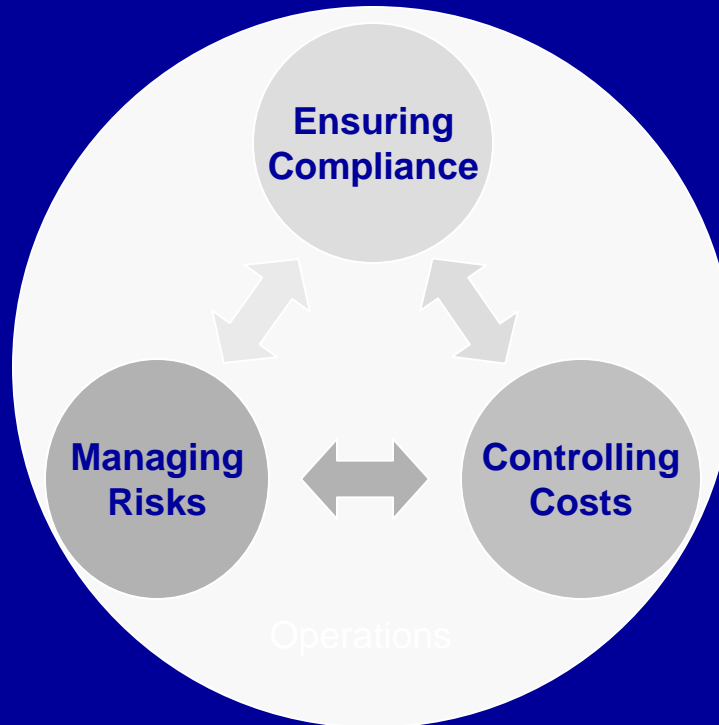
Intellectual  
Capital

Technology

Regulations

Markets

Market  
Participants



**A cost effective  
solution of  
exceptional  
quality**

**Key challenges for NCEL is to balance national priorities,  
reducing risks while improving processes and  
controlling costs**

# Intellectual Capital

- Highly educated and experienced in:
  - Developing and managing high speed IT systems
  - Derivatives trading & portfolio management
  - Foreign exchange & money markets
  - Commercial & investment banking
  - Compliance
  - Process improvement & process management
  - Analytics & risk management
  - Agriculture & commodity financing
- Experience of international markets where “best practices” are the norm



# Core Components of NCEL

## IT & SYSTEMS

- Trading Systems
- Connectivity and networks
- Database & Disaster Recovery
- Application development

## ANALYTICS

- Risk Management
- Research
- Real-time Analysis
- Software Specifications

## OPERATIONS

- Clearing and Settlement
- Margining and Accounting
- On-line Banking
- Delivery

## COMPLIANCE

- Member Services
- Surveillance and Monitoring
- Discipline and Enforcement
- Process Management

## PRODUCT RESEARCH & DEVELOPMENT

- Contract Development
- Specifications and Testing
- Logistics and Spot Market Practices



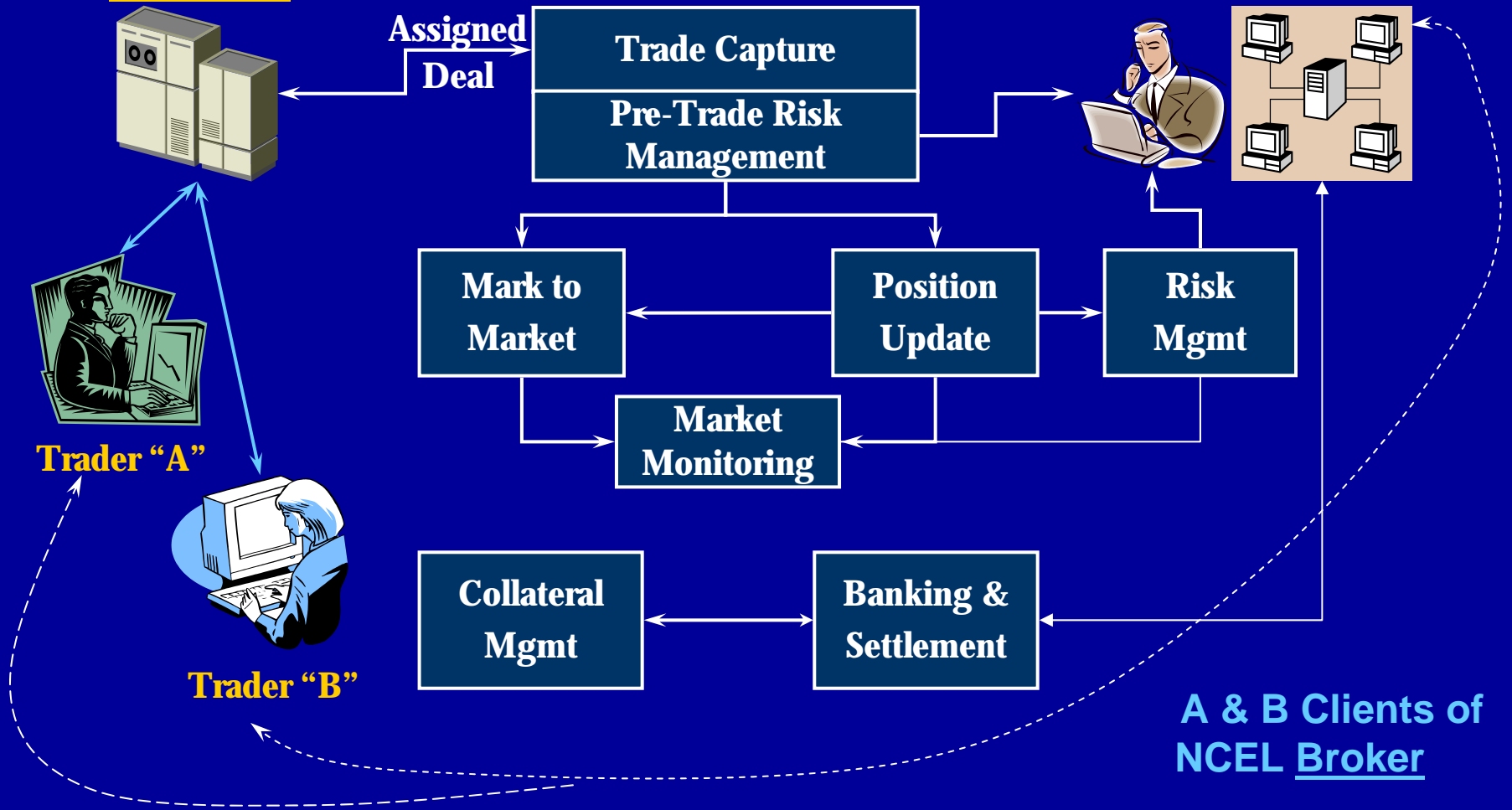
# NCEL Technology

# NCEL Trading System

# NCEL Trading

## Platform

# NCEL Broker



J-Trader Trading Client 6

J-Trader

Default Desktop

- Window 1
- Window 2

AboutSettingsExit

HostPrice FeedLinksToolsNewTile HorizontalTile VerticalMinimize All

Messages

MessagesAlertsRFQs

Sequence	Type	Message
1	Normal	Price Feed link changed from Connecting to Con

Window 2

Hot QuotesMatrixStatusPositionReportsAccountsOptionsStrategies

Implied PricesAccount: TEST123

Contract	Bid	Bid Vol	Offer	Offer Vol	Last	Last Vol
NCEL \ GOLD \ DEC 05					9200	4
NCEL \ GOLD \ JAN 06	8014	1	8020	1	8014	8
NCEL \ GOLD \ FEB 06	8999	81	9000	4	8300	100

Window 1

Hot QuotesMatrixStatusPositionReportsAccountsOptionsStr

Position: OpenProfit & Loss: -102880.00Account

Contract	Net Pos	Average	Last	Open P&L
NCEL \ GOLD \ JAN 06	+8	9300.0	8014	-102880.00
TOTAL:	+8			-102880.00

Fills

Fill ID	Order ID	Lots	Price	Filled
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Trade (1)

Exchange: NCELCommodity: GOLDContract Date: DEC 05Order Type: LimitTicketLots: 1Price: 9200Limit Price: 9200Good Till Date: 9/3/05Account: TEST123Reference:Time: 03/09/05 05:42:02Priority: 0Bid:Offer:Last: 9200

123456789102050100200500Set to ZERO

BuyChange to SellCancel

Create InactiveClose After Trade

NCEL \ GOLD \ FEB 06 (1)

Account: TEST123

Bids			Offers		
Price	Volume	Accum	Price	Volume	Accum
8999	81	81	9000	4	4
8998	88	169	9001	22	26
8997	125	294	9002	121	147
8995	132	426	9003	187	334
8994	4	430	9004	77	411
8992	165	595	9005	110	521
			9006	66	587

Lots: 1Disable trading

Start

M...2 M...6 I...7 M...P...T...5 v...3 F...5 M...2 M...O...a...7 J...

10:43 AM



# NCEL Operations

# NCEL Advantage

- NCEL able to start from the point other leading exchanges have reached
- Not copycat. Each borrowed technique and method is fully re-engineered to suit local market
- Established exchanges realise need for reforms but adapt slowly over time given their size and history
- NCEL can leap-frog straight to the future using tried and tested methodologies from around the world but adapted to local conditions

# NCEL Operations v Rest of World

## NCEL

- Online, Electronic Trading up to client level with UID for all
- Client has direct access to the market with pre-trade checks
- Margining for each and every account at Exchange level
- Monitoring up to client level
- Margins in cash only

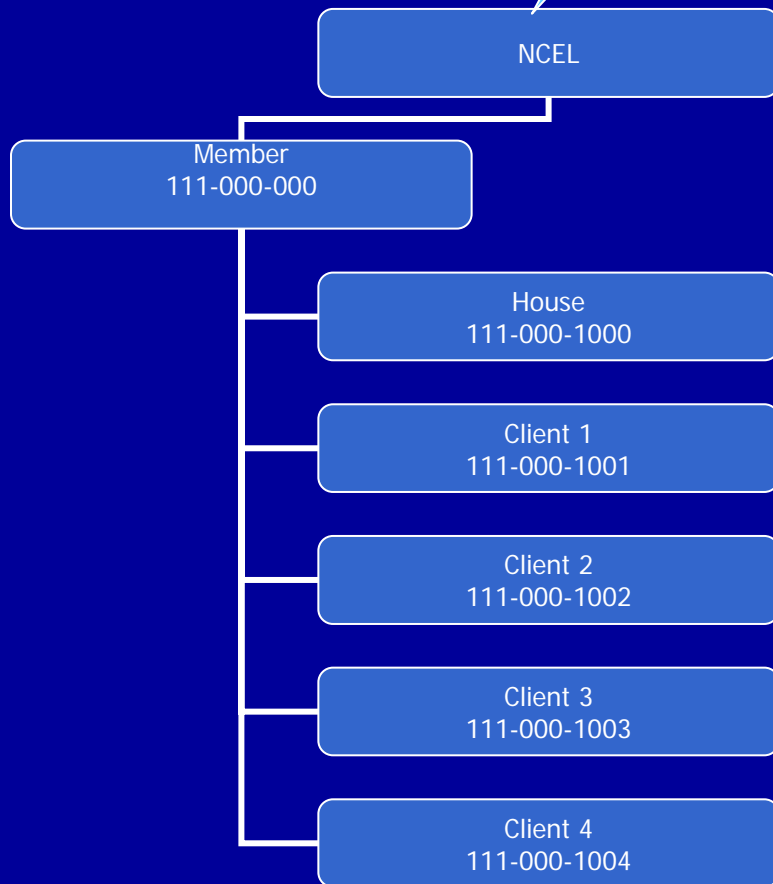
## International Practice

- Physical and Electronic
- Brokers provide online access
- All orders routed through brokers
- Post-trade margining
- Members responsible for margining clients
- Market-wide & broker level surveillance with client level reporting
- Securities are acceptable

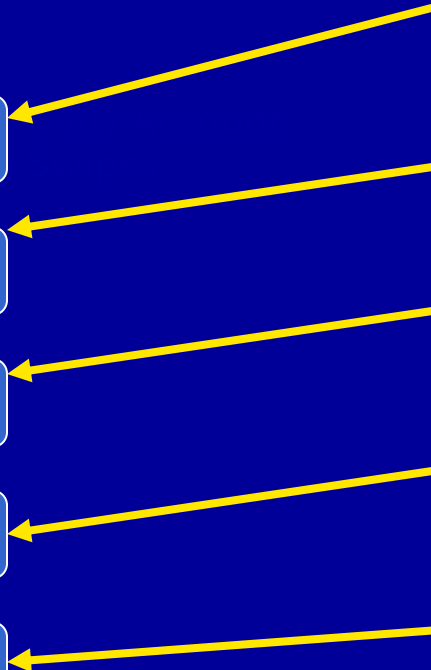
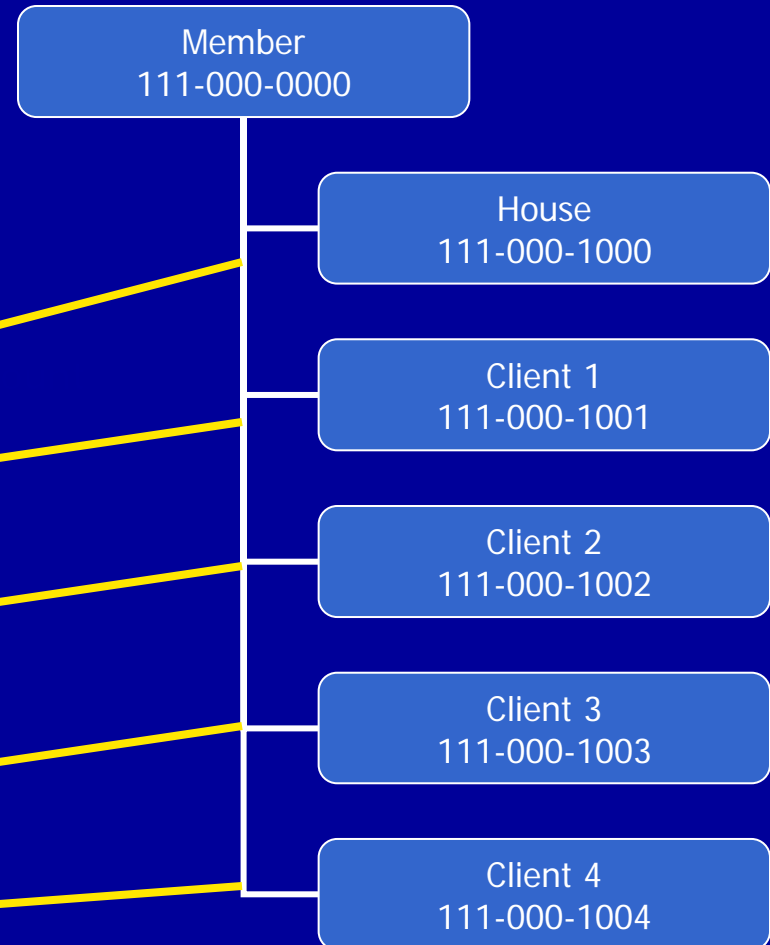
# Completely Segregated Accounts

## NCEL LEDGER

Initial &  
Variation  
Margins and  
Clearing  
Deposits

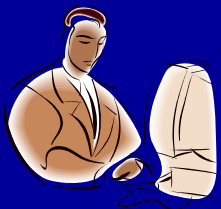


## Online Clearing Bank





Client 1



Multan

Client 2



Faislabad

Client 3



Muree

Symmetric Participation

Natural Longs

Natural Shorts

Online Bank  
Transfer

Client 4

Online Bank  
Transfer



Quetta

Client 1	0891-5660	10,000
Client 2	0891-5661	15,000
Client 3	0891-5662	40,000
Client 4	0891-5663	5,000

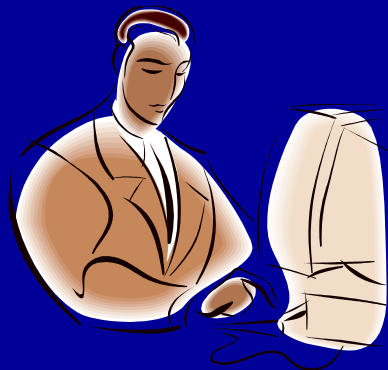
NCEL  
0791-4830

70,000

Online Bank  
Transfer

Online Clearing Bank Accounts

Online Bank  
Transfer

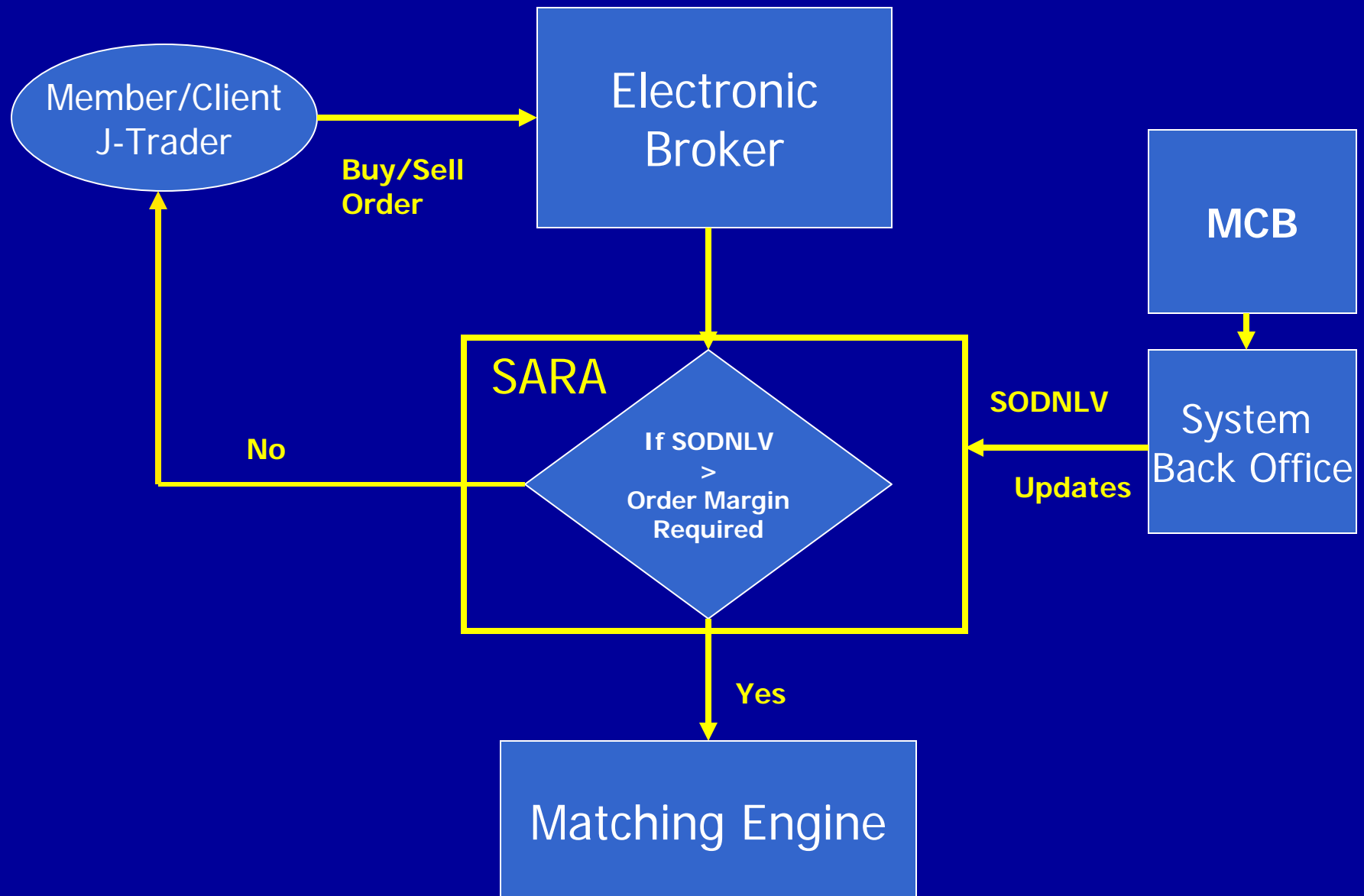


Broker in  
Peshawar



Transfer Client Funds to Exchange

# Pre-Trade Check for Members & Clients



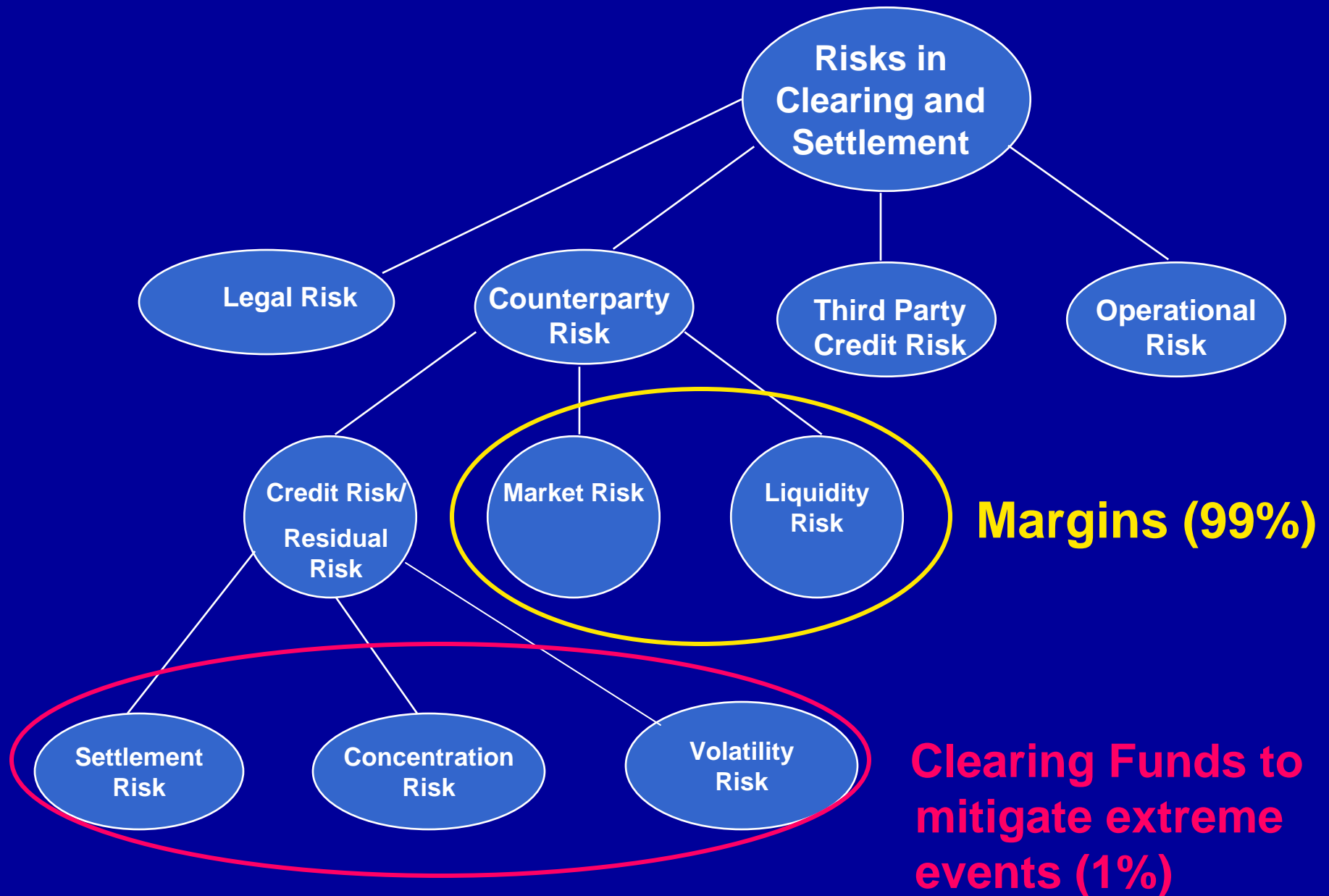
# Daily Settlement

- All positions marked-to-market daily
- P&L of positions in real-time
- Margin calls generated at end of today
- Settlement of margin calls latest by 8.00 PM
- Trading matches fund settlement
- Margins, price limits, and clearing and position limits ensure that few trades progress to the stage of default



# **Analytics & Risk Management**

# Slice N' Dice Approach to Risk Management

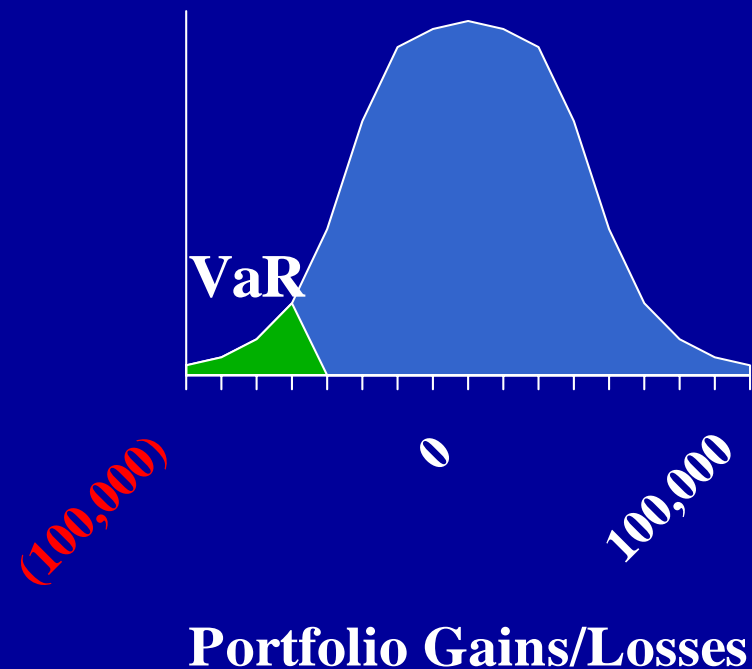


# Value at Risk - An Example

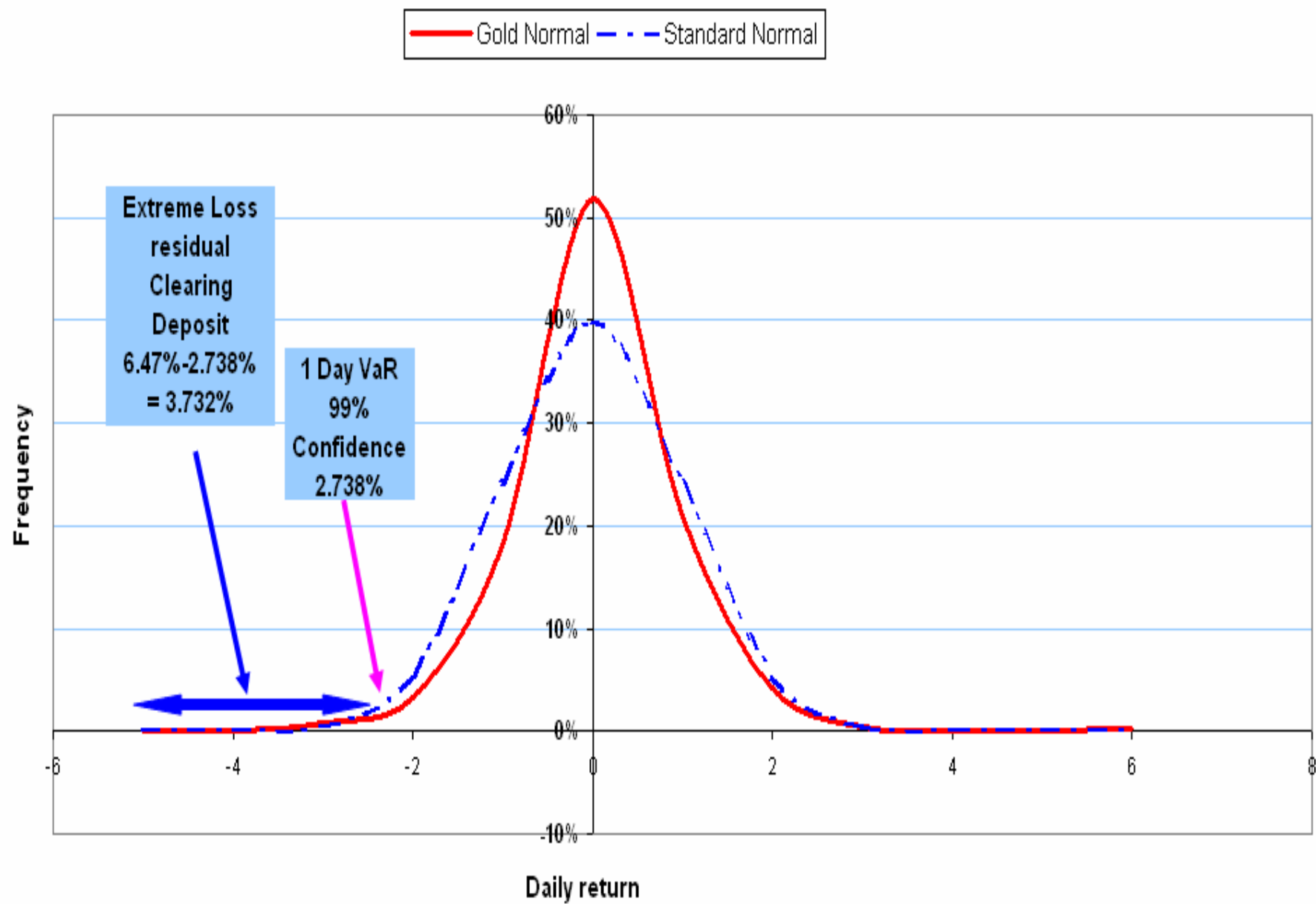
- Let's use a 5% probability and a one-day holding period
- VaR is the one day loss that will be exceeded only 5% of the time
- It's the tail of the return distribution
- In the example, the VaR is about Rs60,000

Probability

## Return Distribution



Dist of Gold returns





# NCEL - RISKMETER

FFC

Wednesday, February 16, 2000

Thursday, August 04, 2005

Load Data

SNO	Day	Price	Difference	DLPR	ABS	STDEVA	VARCoVAR	STDEV6	VARCoVAR6	EWMA	EWMAVAR	HistSim
1335	7/13/2005	128.9	0.75	0.583545713	0.583545713	2.624097333	6.117010927	3.092147926	7.281120340	2.533752702	5.894390213	7.5703
1336	7/14/2005	129.1	0.199999999	0.155038790	0.155038790	2.624214324	6.113179279	3.076839403	7.267927251	2.456857923	5.715506206	7.5703
1337	7/15/2005	129.1	0	0	0	2.623046019	6.104863440	3.076723224	7.262442608	2.382012148	5.541388897	7.5703
1338	7/18/2005	128.3	-0.799999999	-0.621602623	0.621602623	2.622683803	6.101274890	3.075392874	7.250489895	2.314460229	5.384239634	7.5703
1339	7/19/2005	127	-1.300000000	-1.018418516	1.018418516	2.622944767	6.105103579	3.072019334	7.260122216	2.257776158	5.252372766	7.5703
1340	7/20/2005	129.8	2.800000000	2.180771781	2.180771781	2.622488983	6.113078681	3.073041542	7.270519270	2.253230228	5.241797351	7.5703
1341	7/21/2005	131.65	1.849999999	1.415208167	1.415208167	2.625100593	6.105982591	3.079123551	7.261095034	2.211920639	5.145696877	7.5703
1342	7/22/2005	132.5	0.849999999	0.643575948	0.643575948	2.626569959	6.103043357	3.082017913	7.255344698	2.150323041	5.002399435	7.5703
1343	7/25/2005	131.5	-1	-0.757579380	0.757579380	2.625607209	6.093181570	3.074579330	7.212589896	2.093057971	4.869180961	7.5703
1344	7/26/2005	133.5	2	1.509462622	1.509462622	2.623943249	6.085745870	3.051136248	7.197438053	2.062703684	4.798566330	7.5703

Simulation

Confidence Level

0.99

Sample size

252

☐ HistSim☐ VAR/CoVAR☐ EWMAVAR☒ FinalVAR

Calculate

Days (For Margin)

3

Wednesday, February 16, 2005

Monday, April 04, 2005

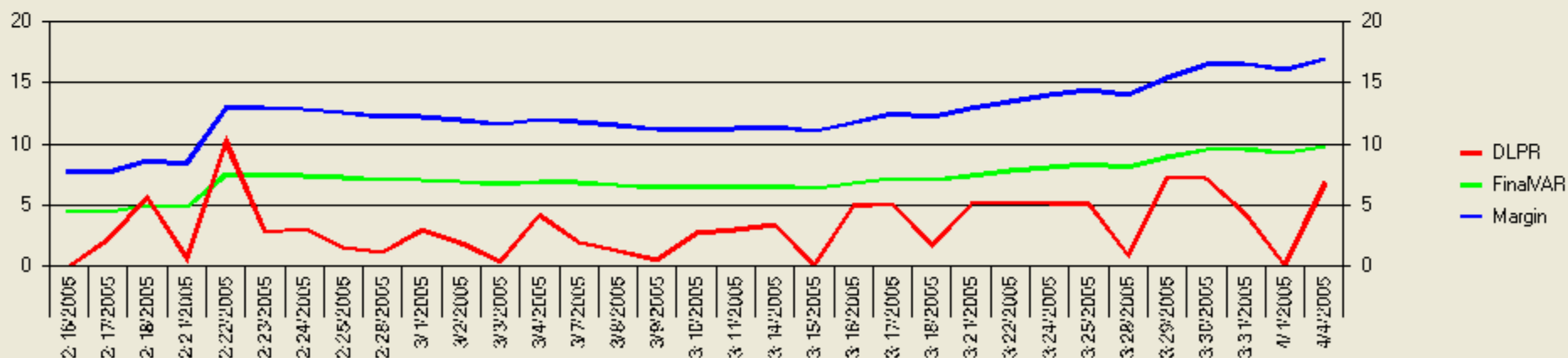
BackTest

Results

Position

FinalVAR: 13.1122%

Sample Data : 33 Pts Start Date : 2/16/2005 End Date : 4/4/2005



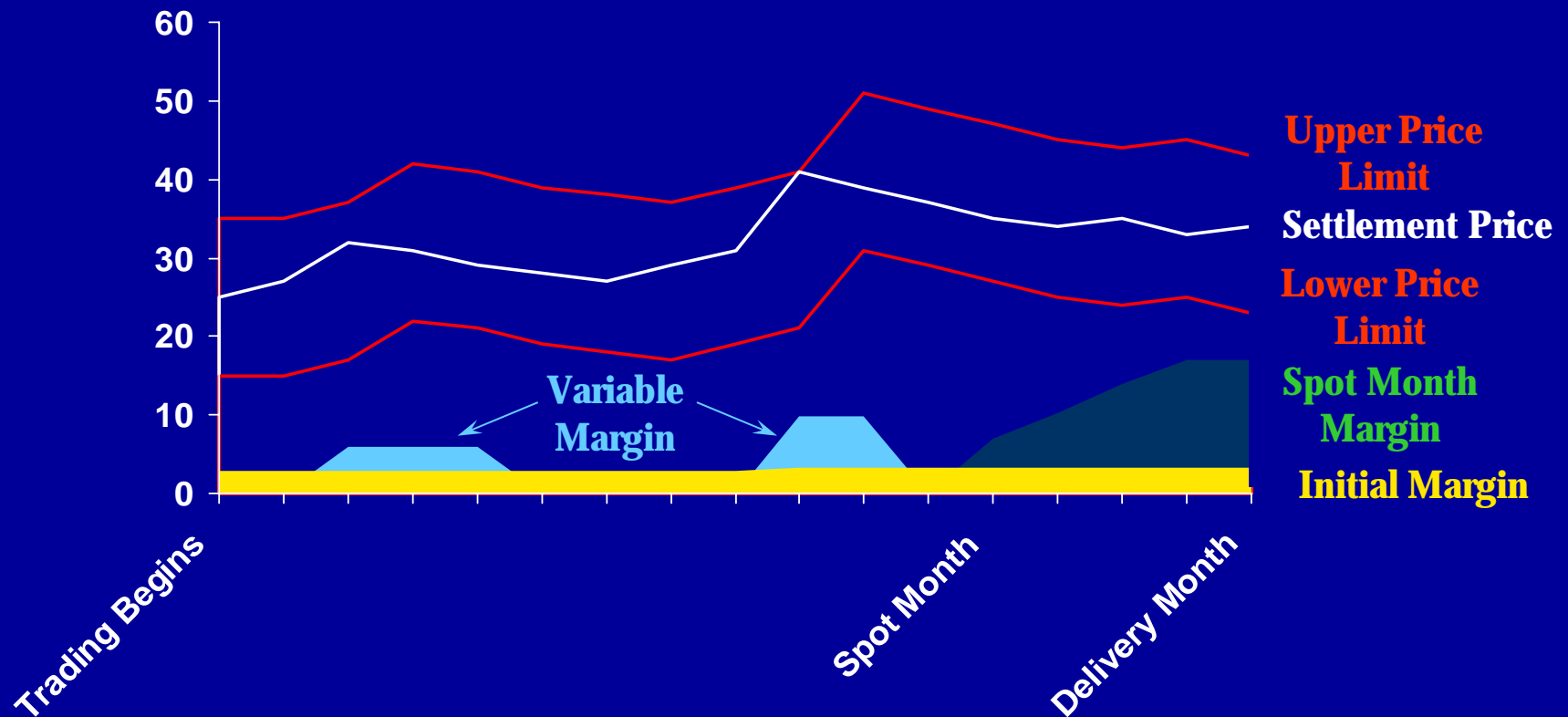
start

11:20  
Friday

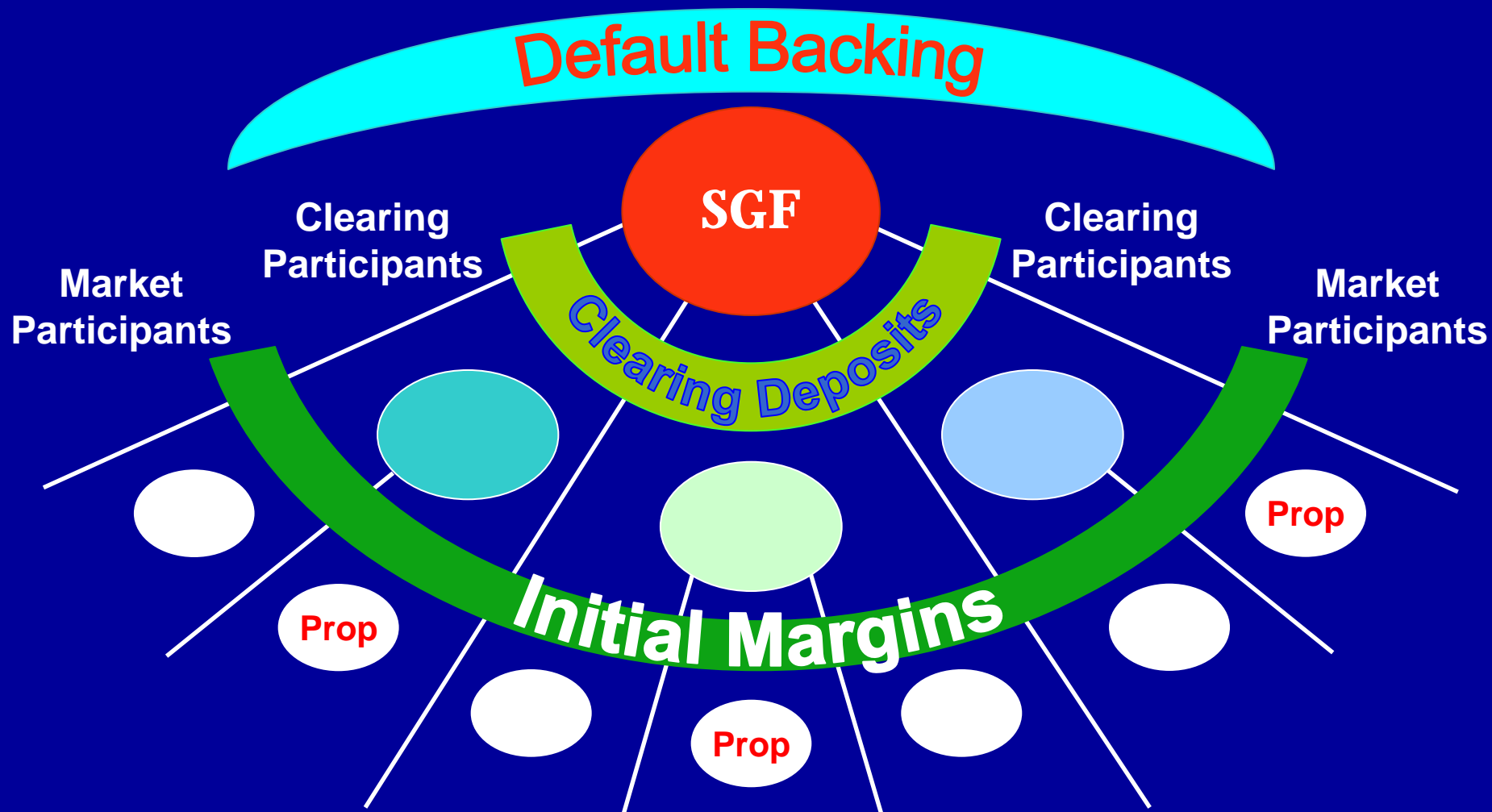


# Risk Management Example

(illustration only)



# Default Protection: Segregation of Participant Risk



# Controlling Excessive Speculation

- Position limits
    - Market wide
    - Broker level
    - Client level
- } **Reduced in delivery month**
- Volatility based variable margining
  - Online and real-time client level surveillance
  - Regulations allow forced reduction of position limits if prudential concerns
  - Close-out if breach of Regulations

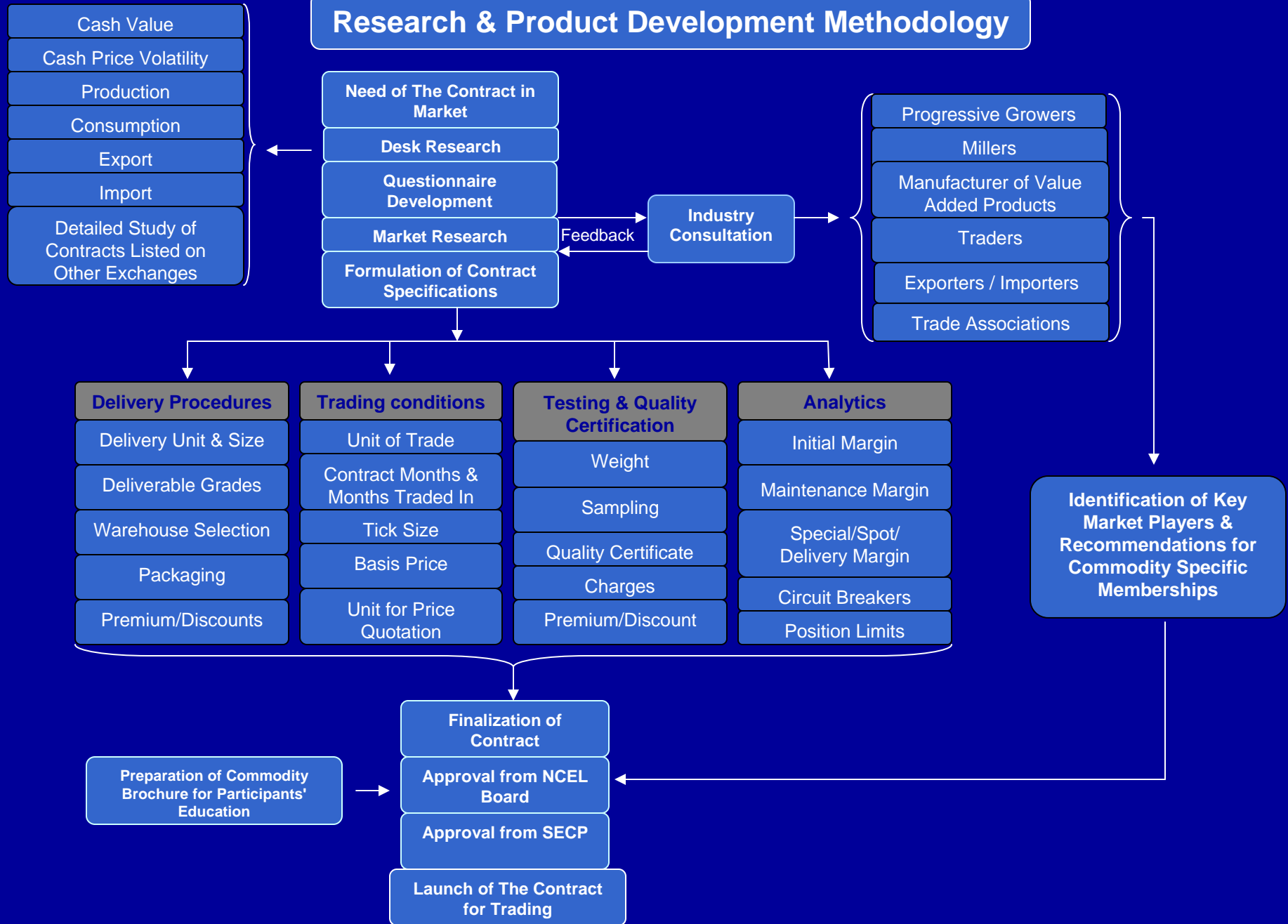


# Contract Design

# Contract Choice and Design

- First Principle: Futures contract should mirror or improve upon the imperfections of the spot market
- Four out of Five new futures contracts fail and are de-listed within the first five years of trading
- Two possible reasons:
  - Lack of demand for the contract itself
  - Poor contract design
- Of course these two reasons are related to one another

# Research & Product Development Methodology



# Product Development

- Futures and hybrid contracts specifications which are ready for listing:
  - Gold, Sugar, Rice, Cotton Seed Oilcake, Wheat and Cotton Yarn
  - NCEL 30 stock, NCEL Bankdex, NCEL Cemdex and NCEL Enerdex indices
  - 3 and 6 months KIBOR Futures
  - C-TFCs (inter-bank repo market)
- Developing steel and cement price indices for the hedging needs of the construction industry – with NESPAK



# NCEL & Agriculture



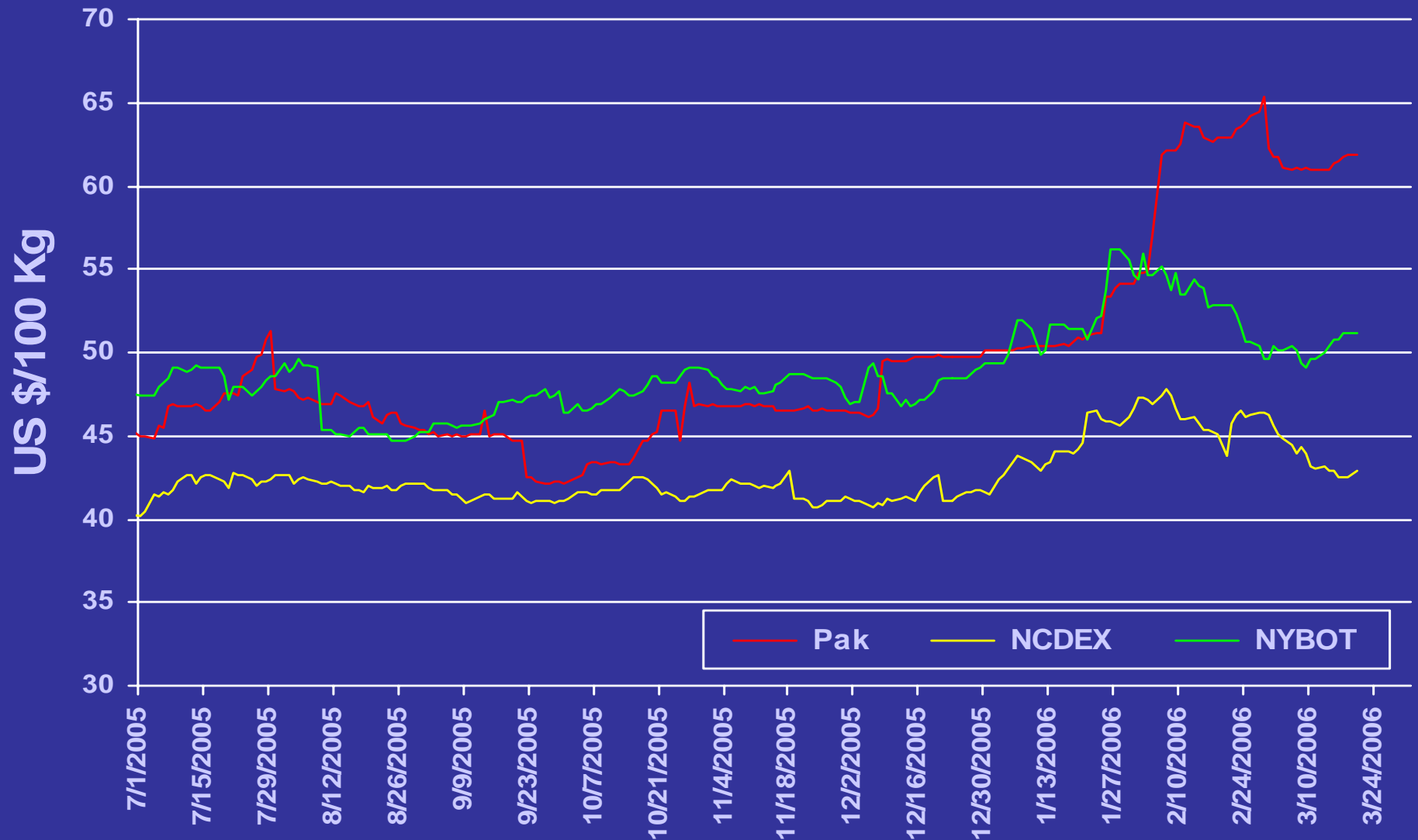
# Benefits of a Commodity Exchange

- Reduces price volatility
- Reveals monopoly mark-up
- Generates signals of future prices, today
- Converts unregulated market into a regulated market
- Empowers state-owned organizations and policy makers to make informed decisions
- Improves input/production decisions, if less price uncertainty, thus improving quality and yield
- **Vehicle for transmission of the trickle down effect**

# NCEL Hub & Spokes



# Sugar Price Comparison



# Price Stabilization Using Futures (Good Harvest)

If a good harvest is expected

**Sale of Futures via Exchange**

**Fall in Futures Price**

**Reduced incentive to hold excess stock**

**Sale of spot stocks**

**Fall in spot price**

**Demand increases with reduction in spot prices**

**Increased Supply meets increased demand**

**Price Stabilization**  
takes place

# Price Stabilization Using Futures ( Bad Harvest)

**Purchase of Futures via Exchange**

If a bad harvest is expected

**Rise in Futures Price**

**Increased incentive to hold excess stock**

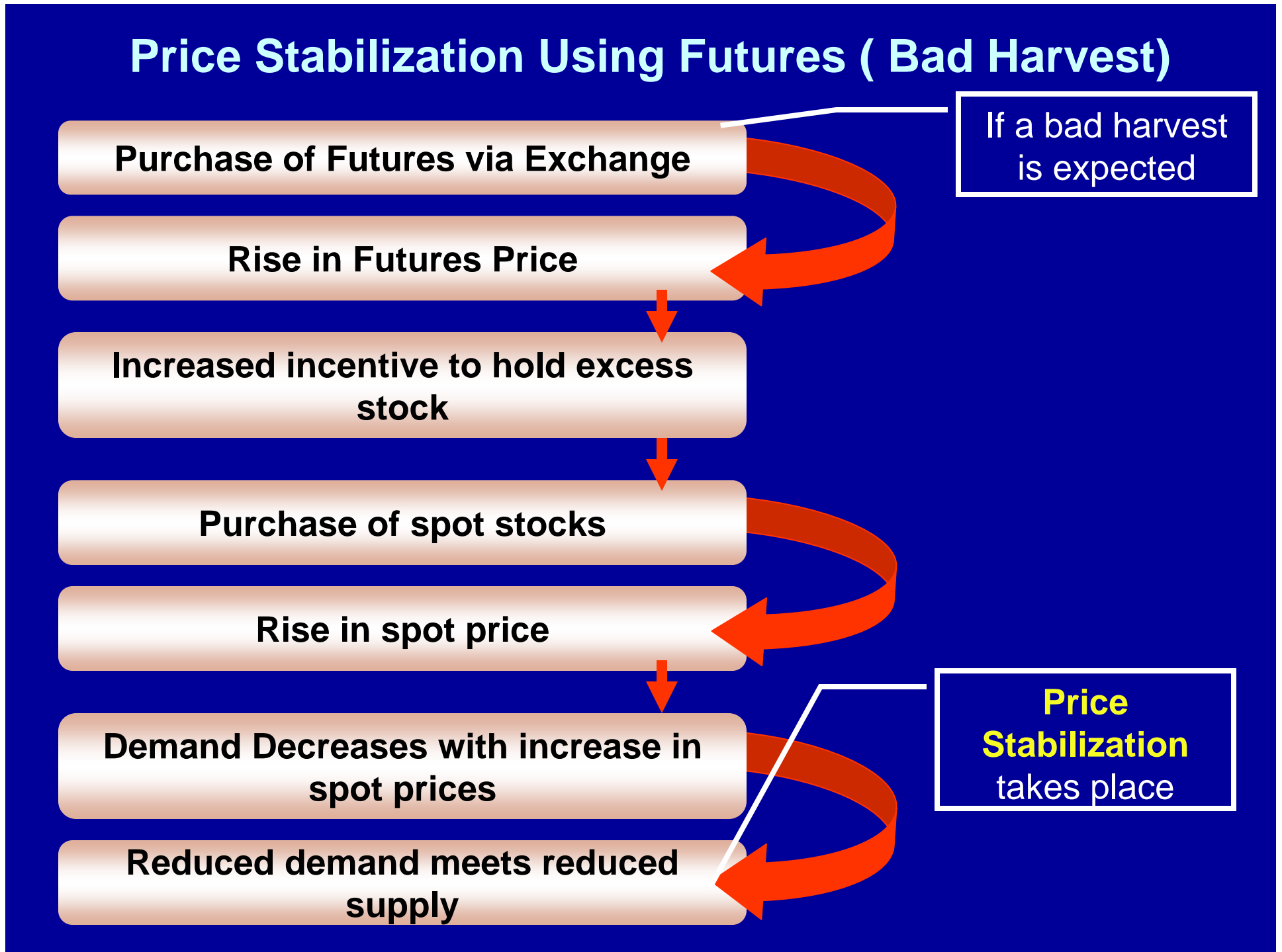
**Purchase of spot stocks**

**Rise in spot price**

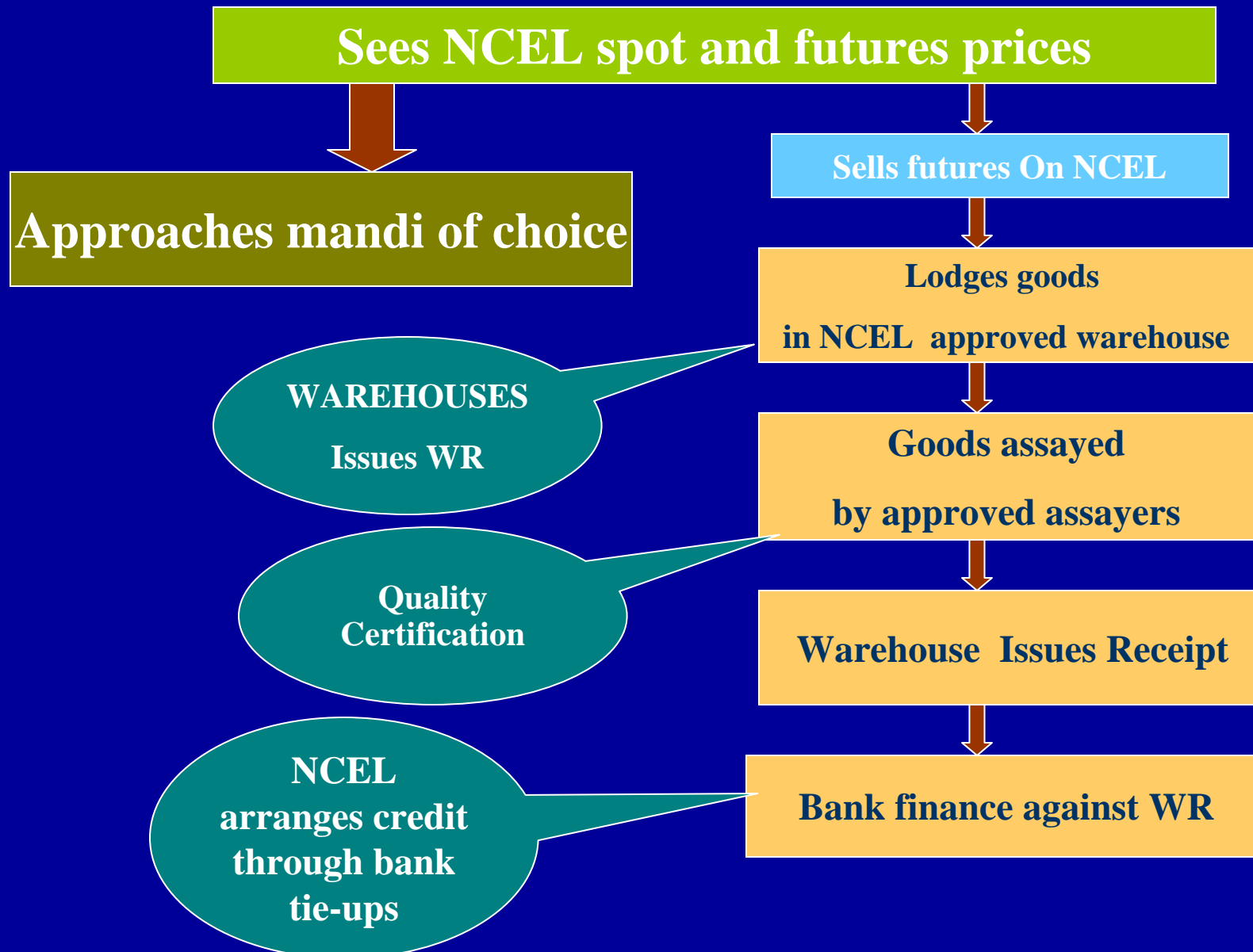
**Demand Decreases with increase in spot prices**

**Reduced demand meets reduced supply**

**Price Stabilization**  
takes place



# Trading & Delivery Process



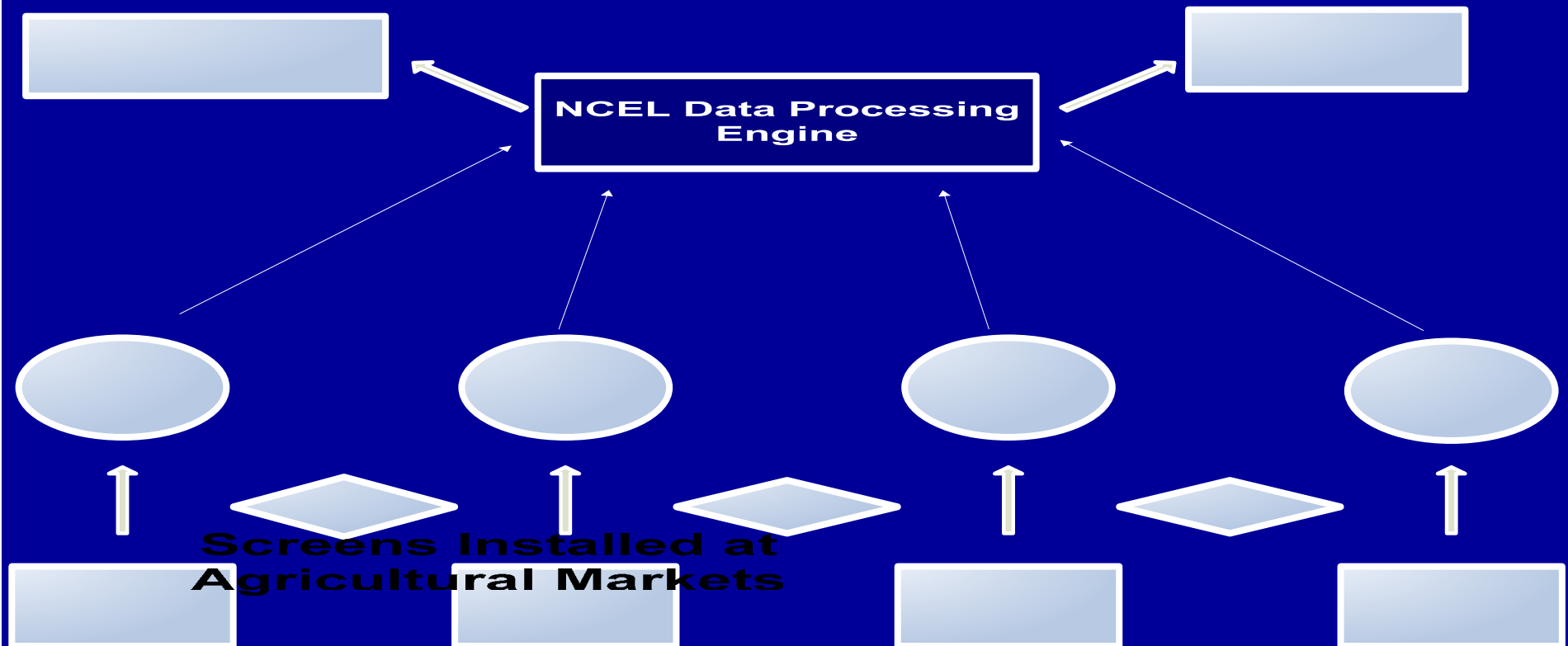
# Prerequisites for Commodity based Financing

- To convert agricultural produce into a tradable instrument – Warehouse Receipt
- But it Requires an Institutional Framework
  - Sound banking system
  - Futures exchanges
  - Price stability
  - Network of warehouses
  - Collateral Managers

**The Concern is warehousing and collateral managers**

# Proposal – Jointly with MINFAL

## Process of Electronic Agricultural Market Information System (EAMIS)



If approved, NCEL plans to link 11 major mandis in the next 3 months



Thank You