India market - Trading opportunities & considerations

By:

Manish Jalan

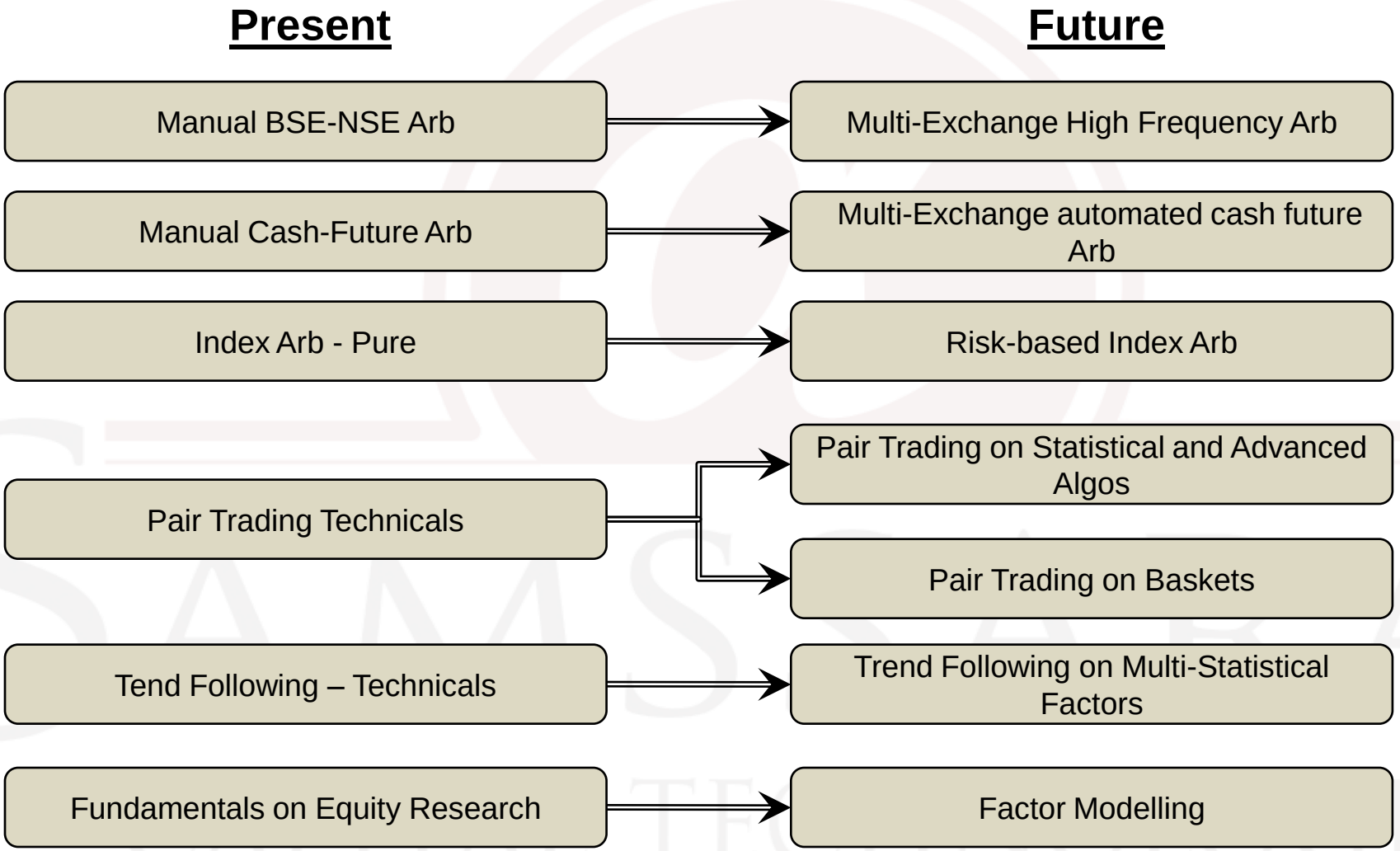
Director, Samssara Capital Technologies LLP (www.samssara.com)

Introduction - where to focus in Indian equity trading?

The changing structure - receptiveness to quant & algo trading

- Players are becoming more receptive to computer based trading
- Large brokers like Edelweiss, Religare, Motilal Oswal, Quant etc. are investing heavily in technology infrastructure
- SEBI, Exchanges and Government becoming more receptive to automated trading and DMA/DSA
- Co-location and latency of trades are becoming buzz-words
- Traditional bread-and-butter strategy like cash-future arbitrage is eaten away by computer programs
- Indian software makers like Falcon, Omnesys, FT etc. are very aggressively providing trading solutions

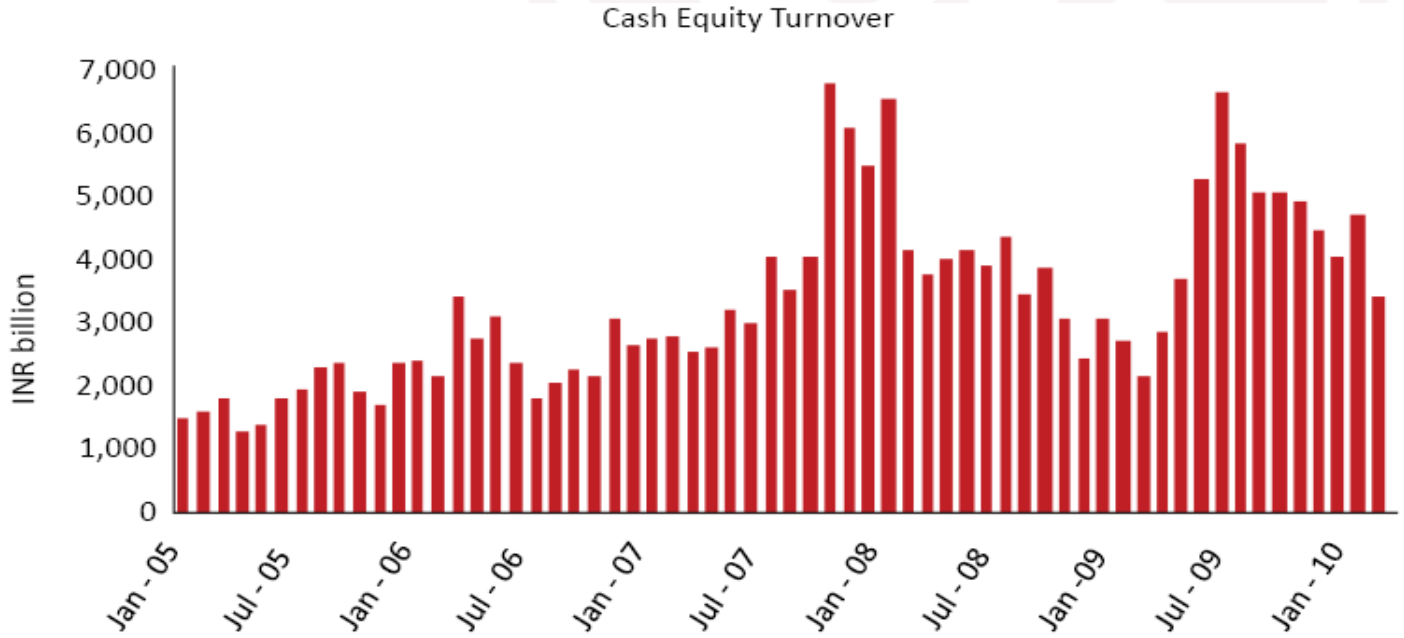
The prop trading – catching with developed markets



SAMSSARA

Cash Equity – turnover stays flat

- Traded on BSE and NSE
- The turnover has stayed constant over last 4 years
- Expected to stay constant unless STT cost is abolished or large FII buying kicks in (Bull market)
- Most domestic players involved in cash-future arbitrage (Mostly on NSE)
- Efficiency of arbitrage improves with co-location
- Short-selling in cash allowed only on Intra-day trading (stock borrowing still not wide spread)
- Stock borrowing and shorting is restricted for FII



Source: Celent Research

SAMSSARA

Large, Mid and Small caps in India – where to focus?

- Total number of listed stocks = 3,756
- Focus on Large and Mid-cap stocks for most form of trading strategy
- Top 210 names in India for statistical arbitrage

Large cap, mid cap and small cap listed companies in India

	Large Cap	Mid Cap	Small Cap
Market cap filter	>= USD 10 billion	>= USD 1 billion and < USD10 billion	< USD 1 billion
# of companies	29	126	177
Average daily turnover (USD Million)	64	8.6	0.72
Average daily turnover per stock (INR billion)	1.86	0.41	0.02

Source: Bloomberg

ADR/GDR/IDR Statistics – good opportunity for offshore entity

- Most common is ADR to BSE-NSE cash arbitrage
- 2-way fungibility or conversion of shares are allowed
- Carries overnight directional risk and dollar-rupee risk
- Most common with FII / I-Banks having desks in US and India
- Not dominant with domestic players due to off-shore entity registration, currency risk, dollar erosion etc

ADR/ GDR/ IDR statistics

	ADR	GDR	IDR
# of companies	15	205	01
# of issues	42	389	01
Total Average daily volume (million)	10.2	1.0	0.55
Average daily volume per stock (million)	0.30	0.02	0.55
Total average daily turnover	USD 317.1 million	USD 83.0 million	INR 65.0 million
Average daily turnover per stock	USD 9.3 million	USD 1.2 million	INR 65.0 million

Source: Bloomberg

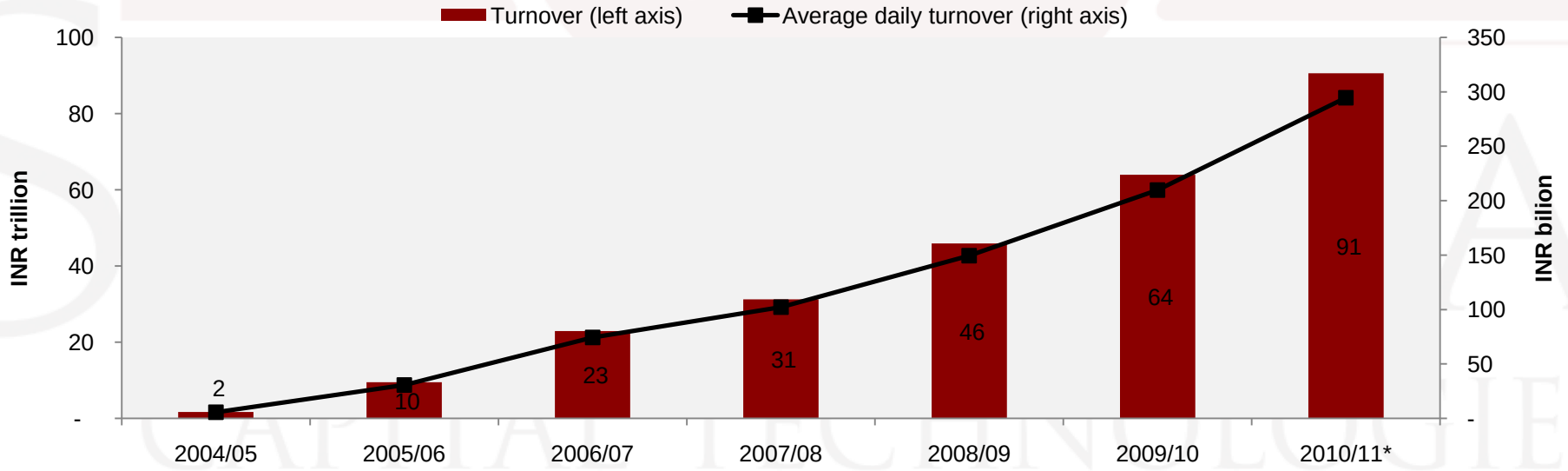
Newer opportunities in trading in India : The emerging exchanges and instruments

New exchanges – opens more window to domestic players

- Indian market maturing by opening to commodities, interest rates and currency futures trading
- Immense opportunity in market making and cross exchange arbitrage in all the new exchanges
- Cost of trading extremely low as STT don't exist in these instruments
- E.g.: Total exchange cost of trading in MCX is 0.3 BP, which gets reduced further with volumes
- High-frequency trading opportunity is more on commodities and currency futures in India
- Heavy market making and high frequency fair price discovery becoming prevalent

MCX – commodities exchange of India

- 6th largest amongst global commodity futures exchanges by volume
  - #1 in Silver
  - #2 in Gold Copper and Natural Gas
  - #3 in Aluminum, Zinc and Crude Oil
- One of the fastest growing commodities exchanges in the world
- 40 commodities across various segments such as bullion, metals, agriculture and energy products
- Tremendous growth in turnover due to heavy arbitrage between CME/LME and MCX
- Cross exchange arbitrage between NCDEX and MCX



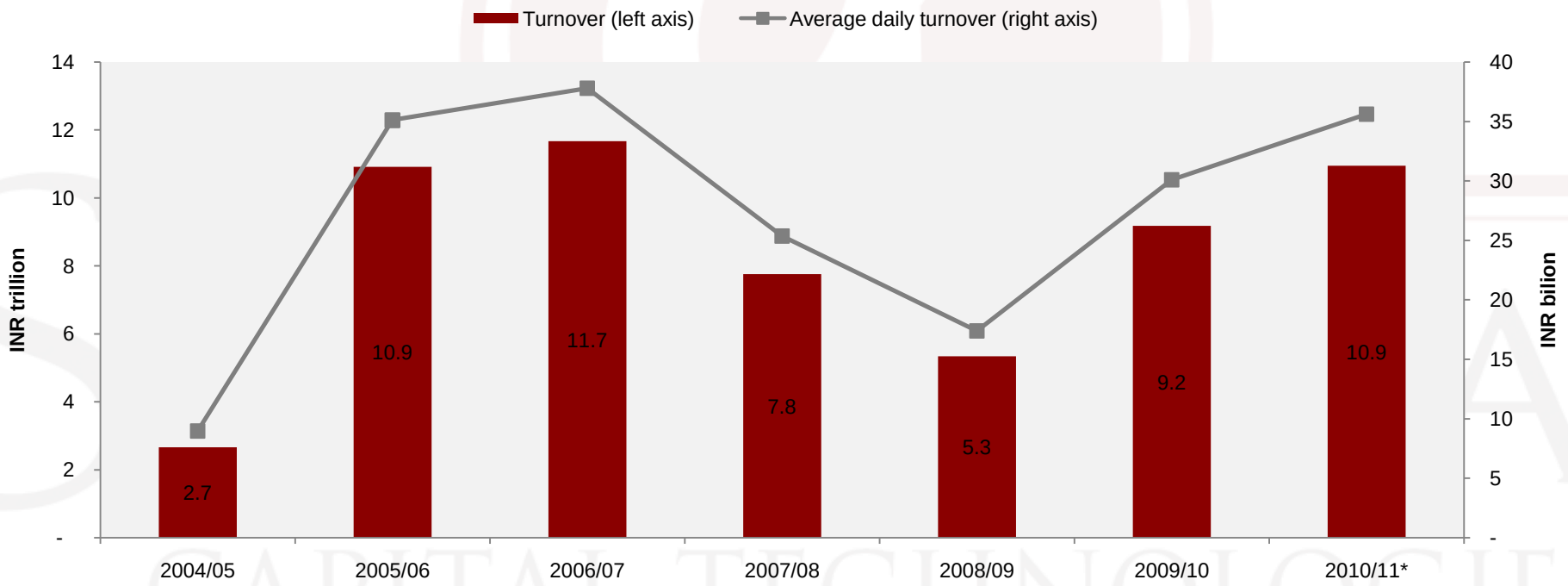
*Annualized based on 8 months data (Apr – Nov)

Source: MCX

SAMSSARA

NCDEX – agri commodity exchange

- Most active in the agricultural commodity space
- Trades totally 59 commodities - comprising 39 agricultural commodities
- High expiry and delivery risks exists in agri commodities
- Not very popular with arbitrageurs and market makers



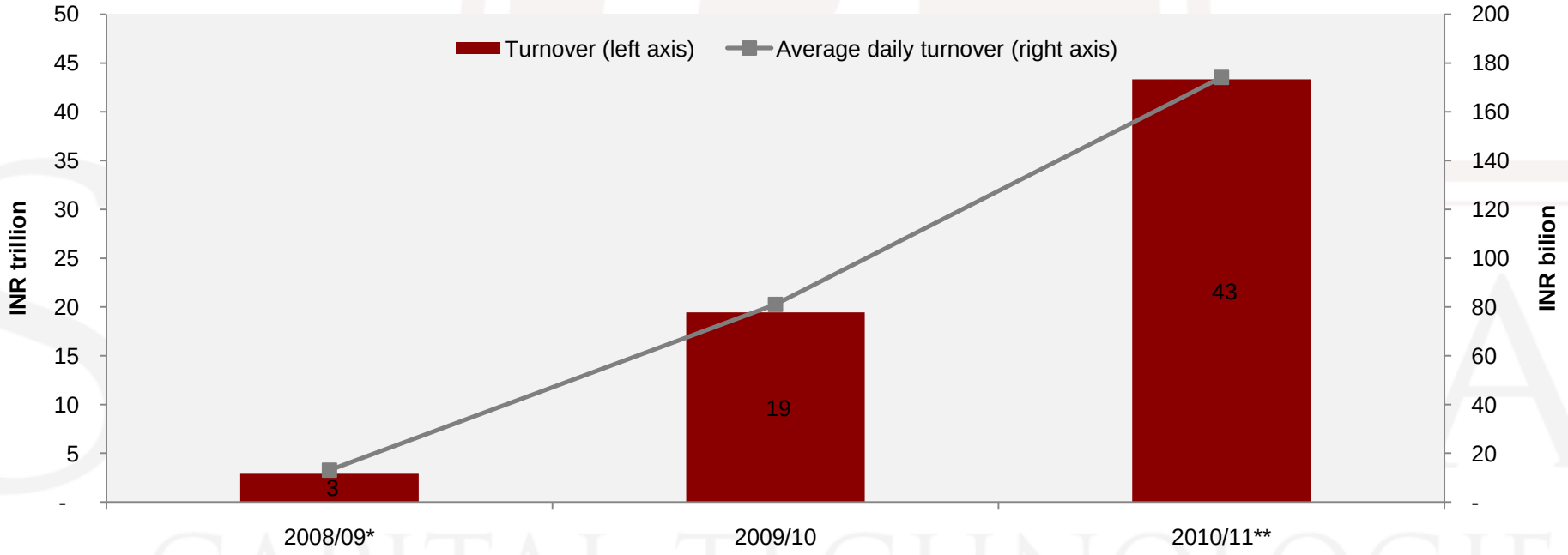
*Annualized based on 8 months data (Apr – Nov)

Source: NCDEX

SAMSSARA

MCX-SX – threat to established stock exchanges

- Started with currency derivatives exchange on October 7, 2008
- Offers currency forward contracts in USDINR, EURINR, GBPINR and JYPINR.
- Wide range of participants - Hedgers, Investors and Arbitrageurs
- Market making in USDINR Vs all other currency contracts are most prevalent



*Annualized based on 6 months data (Oct – Mar)

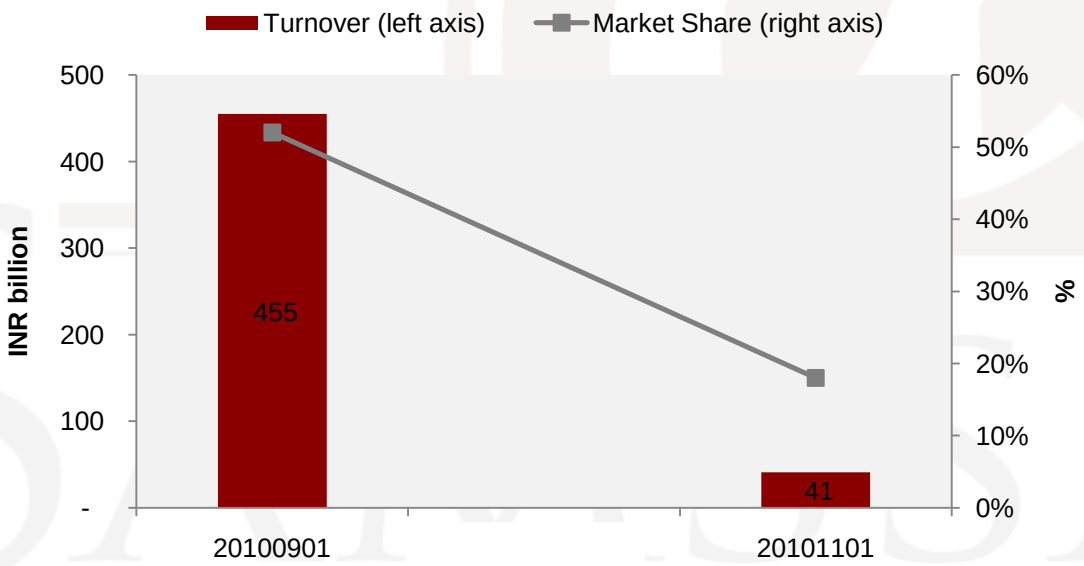
**Annualized based on 8 months data (Apr – Nov)

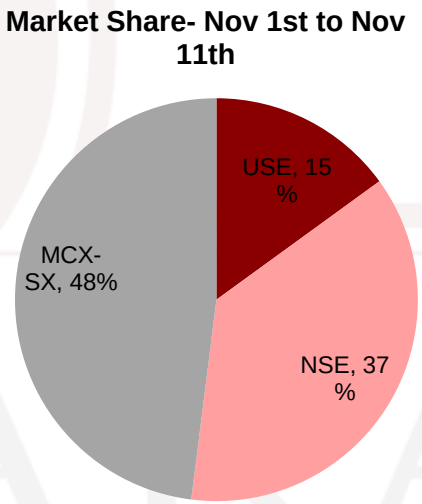
Source: MCX-SX

SAMSSARA

United Stock Exchange (USE) – the currency exchange

- Trading in currency futures and currency options
- 12 futures contracts in 4 currency pairs – USDINR, EURINR, GBPINR and JPYINR
- USD-INR currency options contract.
- Cash settled (no physical delivery) in INR at RBI reference rate.





Source: United Stock Exchange, Secondary Research

SGX Nifty – pure arbitrage opportunity

- Contract size: USD 2* contract price
- Position limit: 25,000 net long or short
- Dollar denominated
- Contract : 2 nearest months and 4 quarterly contracts
- Short term arbitrage opportunity from the short-term price difference between CME Nifty and SGX Nifty
- Can be traded to hedge risk from existing exposure to the Indian stock market
- No STT cots on SGX Nifty futures and hence preferred by arbitrageurs
- Dollar erosion of the domestic player and difficulty to park money offshore – hence arbitrage exists
- Average daily turnover: 350 Mn. USD – 500 Mn. USD

SGX Nifty

	FY 2010 (Jun'09 – Jun'10)	FY 2011*
Volume	8,748,924	4,659,640
Average daily volume**	35,278	43,548

*Estimated based on 5 months data

** # of trading days on the basis of Nifty trading days in India

Source: SGX

CME Nifty Futures – nifty futures goes global

- E-mini and E-micro S&P CNX Nifty Futures
- Waived CME Globex and CME Clearing fees through Dec 31, 2010 for all market participants
- Block trade eligibility for both contracts
- Mutual Offset System (MOS) Eligibility for E-micro S&P CNX Nifty Futures with SGX
- Dedicated market makers to help generate initial liquidity and two sided markets
- Contract size: E-mini (USD 10* Index) and E-micro (USD 2* Index)
- Short term arbitrage opportunity from the short-term price difference between CME Nifty and SGX Nifty
- Can be traded to hedge risk from existing exposure to the Indian stock market
- Significant turnover as compared to other international indices trading at CME

SGX Nifty

	E-MINI	E-MICRO
Volume	5,757	135,592
Average daily volume*	61	1,442
Turnover (USD million)**	326	1,549
Average daily turnover**	3.5	16.5

*# of trading days between Jul 19, 1010 to Nov 30, 2010 (and not since beginning of 2010

** Based on average nifty index value for every month

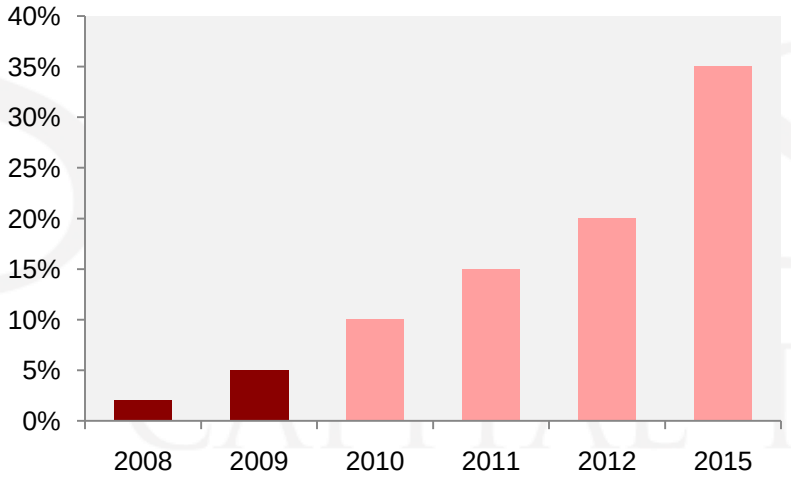
Source: CME

Electronic Trading in India

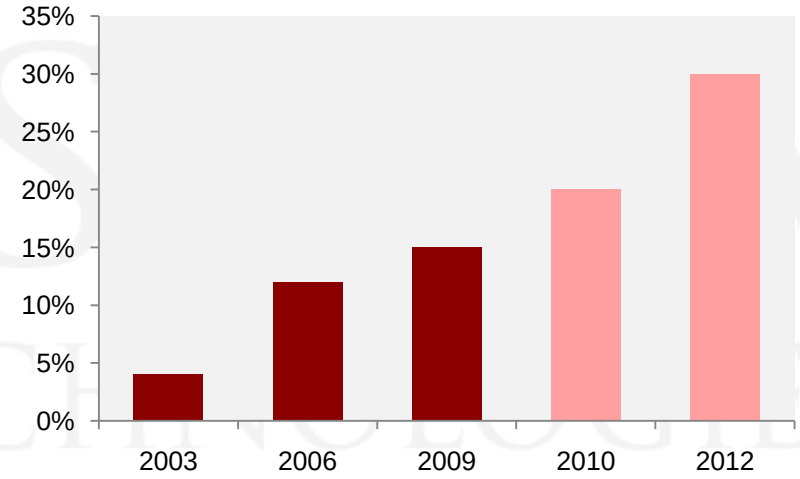
Electronic Trading in India - in early adoption phase

- DMA rapidly growing among institutional investors
- FIIs and DIIs especially large MFs driving change in the DMA acceptance.
- E.g.: Goldman Sachs' equities electronic trading volume tripled, while for futures grew more than fourfold in 2009
- Restrictions on 'direct DMA'
- Tier II brokers in process of adopting technology/ Still evaluating cost-benefit analysis
- Cost of DMA is at 5-8 BP in India as compared to developed markets at 1-2 BP
- Big bottlenecks is absence of data such as market tick data, market depth information (5th level onwards)
- Dominant players: **Goldman Sachs Merrill Lynch, Oppenheimer, J.P. Morgan, Morgan Stanley, Grindlays, Standard Chartered, HSBC**

Share of DMA in Institutional Equities (%)



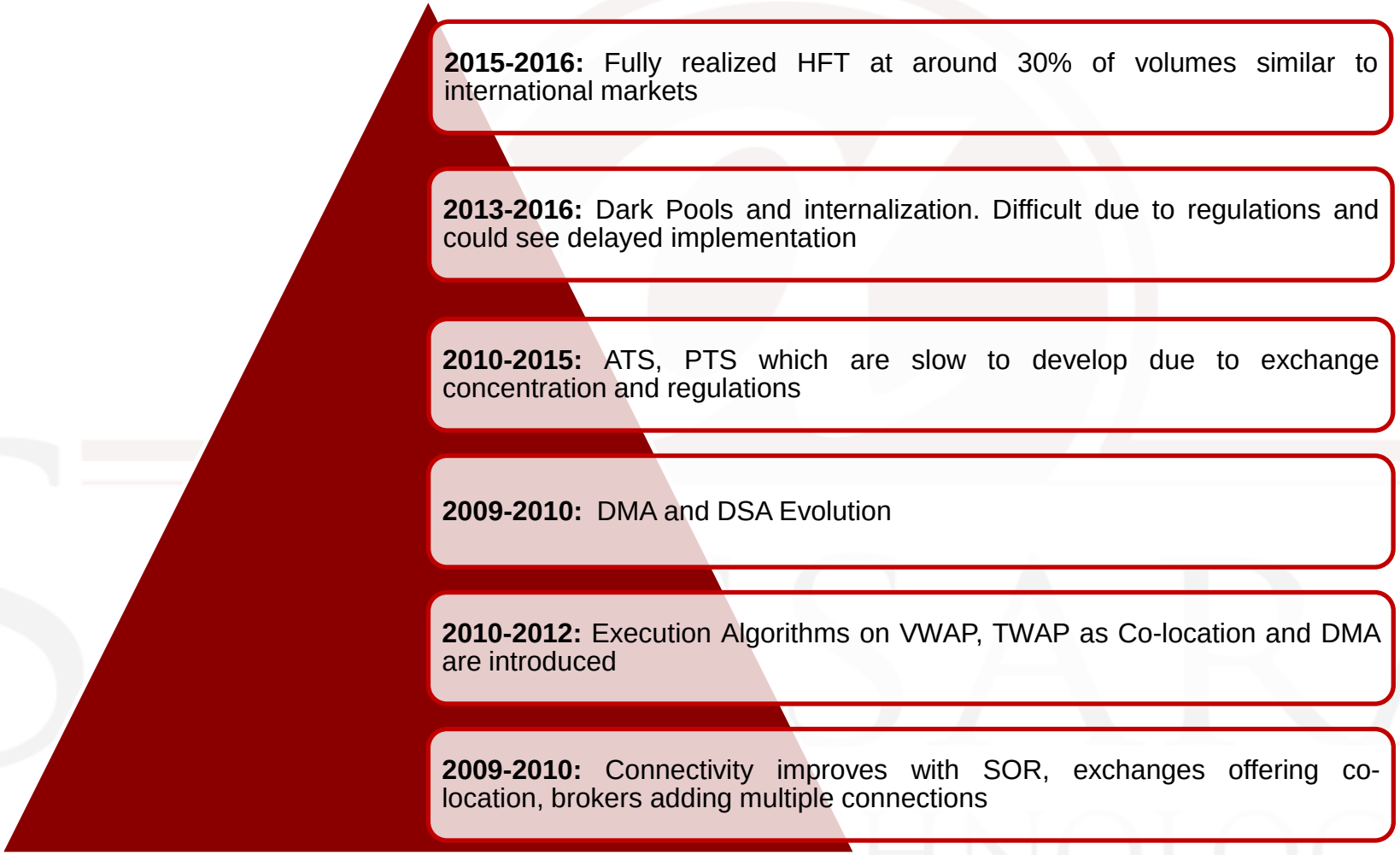
Electronic Trading in Retail Equity Market (%)



Source: Celent Research

SAMSSARA

The growth projection of electronic trading in India



Source: Celent Research

SAMSSARA

Market Data – always a bottle-neck

- NSE provides bucketed 1 sec. data to members of exchange at USD 1200 for 1 Year
- NSE has tick by tick data from 1999 and is available to corporate and members at USD 1200 per year of data
- Co-located entities are not allowed to sell the daily stored tick data
- Tick by tick data is stored in-house by most domestic brokers and are not easily available
  - Other popular sources
  - Reuters
  - eSignal
  - CQG Inc.

Selected trading strategies in Indian market

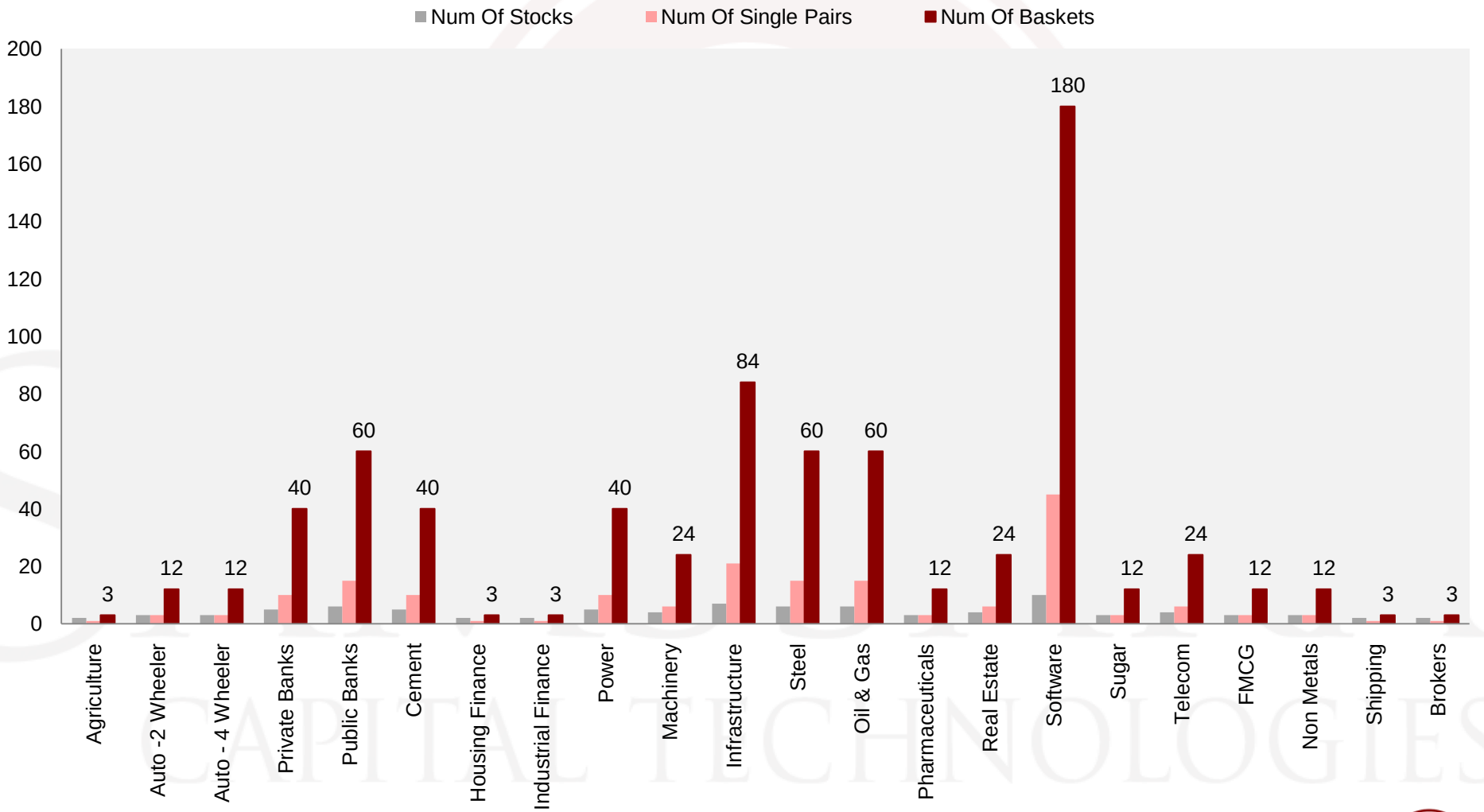
BSE-NSE Arbitrage – selected opportunity still exists

- Mostly intra-day as shorted cash cannot be carried to next day
- Traded on stocks with absolute rupee value >= 20 Rs. (Minimum gross profit of 25 BP is targeted at 0.05 Rs. spread)
- Positions are individually un winded in both the exchanges
- Mostly in mid-caps and small-caps where BSE has more liquidity in cash
- Triggered by large value buy in one exchange or limit high/low prices
- Calculation of equilibrium prices is also considered
- Commonly used software: Falcon and Omnesys
- Other common cross-exchange arbitrage in India
  - Base and precious metals in MCX and NCDEX
  - USDINR in USE, NSE and MCX-SX

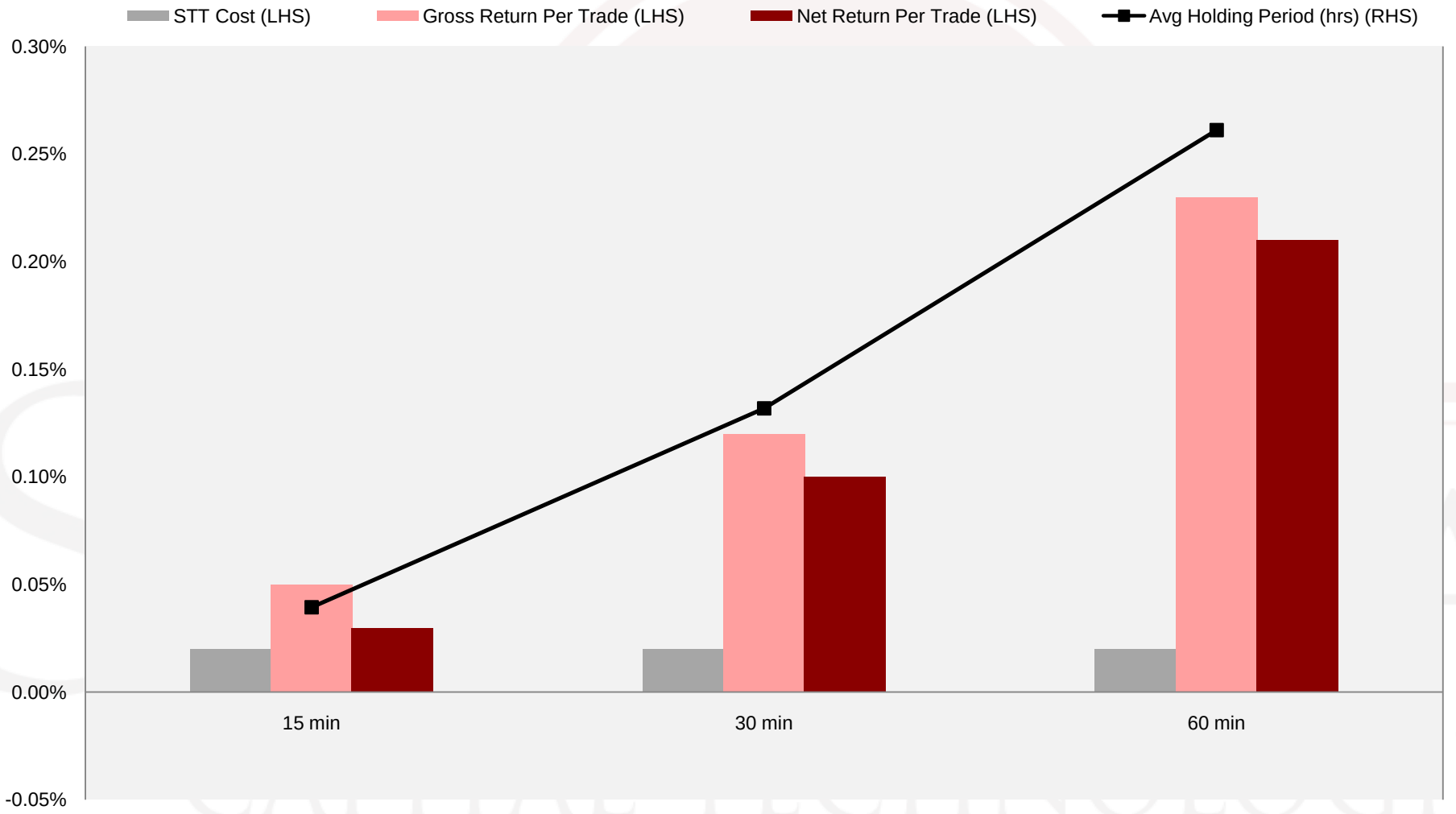
Cash-Future arbitrage – speed becomes the key

- Most common is single stock cash to single stock futures
- Cash and carry is more favorable trading technique
- Reverse cash and carry is not favorable as stocks cannot be shorted and carried
- Future at discount to cash: Can be arbitraged intra-day
- Huge volatility in the cash market in the last 30 min to expiry
- Brokers using co-located servers to take faster advantage of mis-pricing
- Advantage now is of speed as all of cash-future is automated
- Manual execution in cash-future arbitrage yields less then the cost of funding

Single stock pairs and baskets across sectors in India



High frequency stat-arb - comparison of time period



SAMSSARA

High frequency stat-arb – 30 min time period

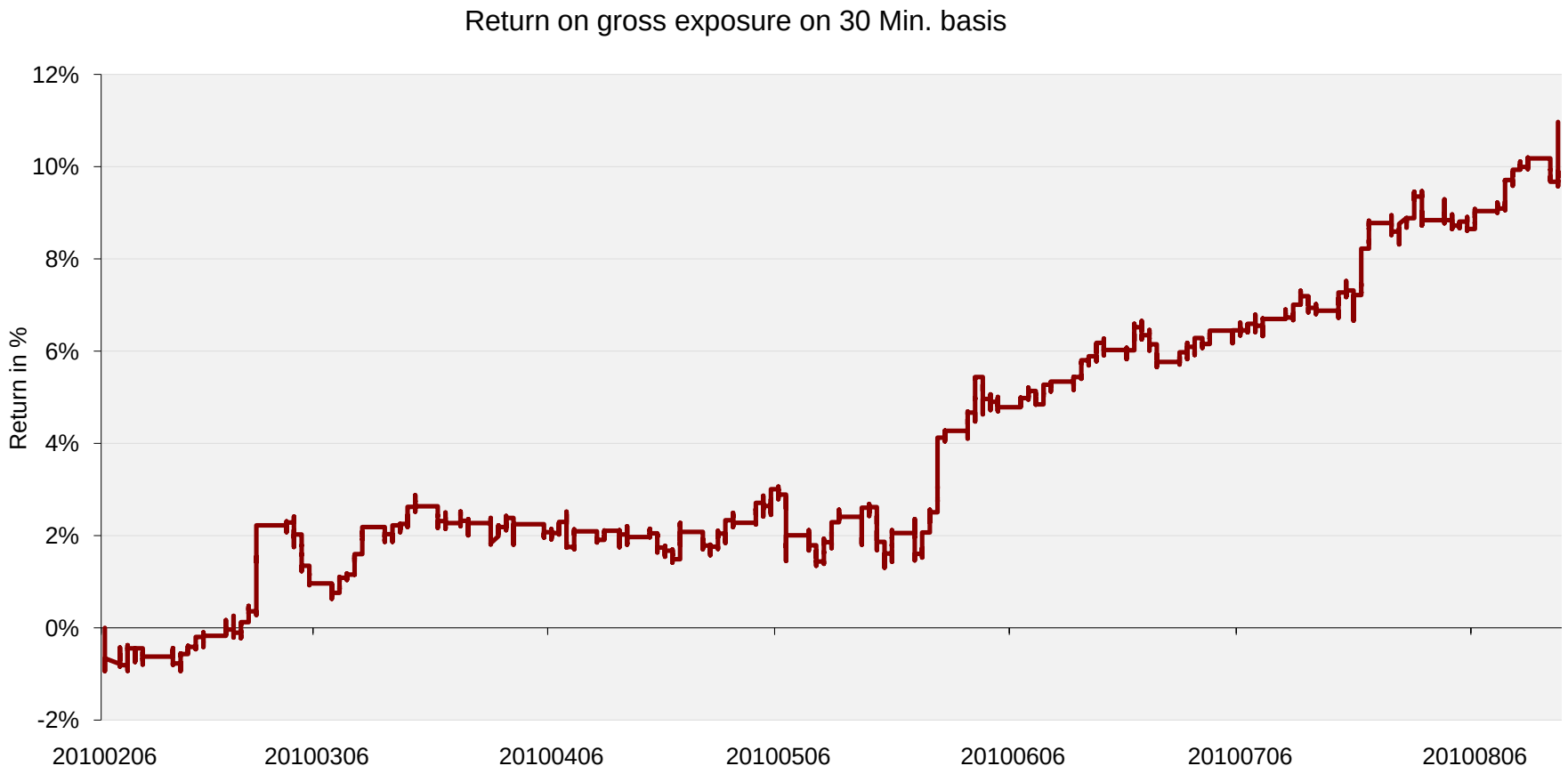
Summary

- High frequency stat-arb in single stock futures by
- Tracking 214 pairs, 22 sectors and 90 liquid stock futures
- Taking the mean, std and other factors over 30 min. time interval
- Entering the trade at Z-Score < -2 and other statistical filters
- Unwinding the trade at convergence to the mean of 20 periods (calculated over 30 min. interval)

Key numbers	Values
Annualized Return	20.78%
Annualized Std. Dev. In Return	6.14%
Annualized Sharpe	3.38
Max peak to trough drawdown (day-to-day basis)	-1.45%
Max flat period (Days)	60
Gross return per trade (average, BP, after 5 BP slippage)	11.09
Net return per trade (average, BP, after STT costs)	6.84
Average Holding Period (in hrs)	3.43
Hit Ratio (% of winning trades)	62.59%
Backtest period	Feb'2010 - Aug'2010
Number of potential statistical baskets and pairs	2000
Average deployment per pair (USD)	8000
Opportunity in a day (15% of the total available statistical pairs)	300
Average daily notional on baskets and single stocks (USD)	2,400,000
Approx annualized P&L (USD)	498,784

SAMSSARA

Equity curve of high freq stat-arb on 30 min. time period



SAMSSARA

High frequency stat-arb – 60 min time period

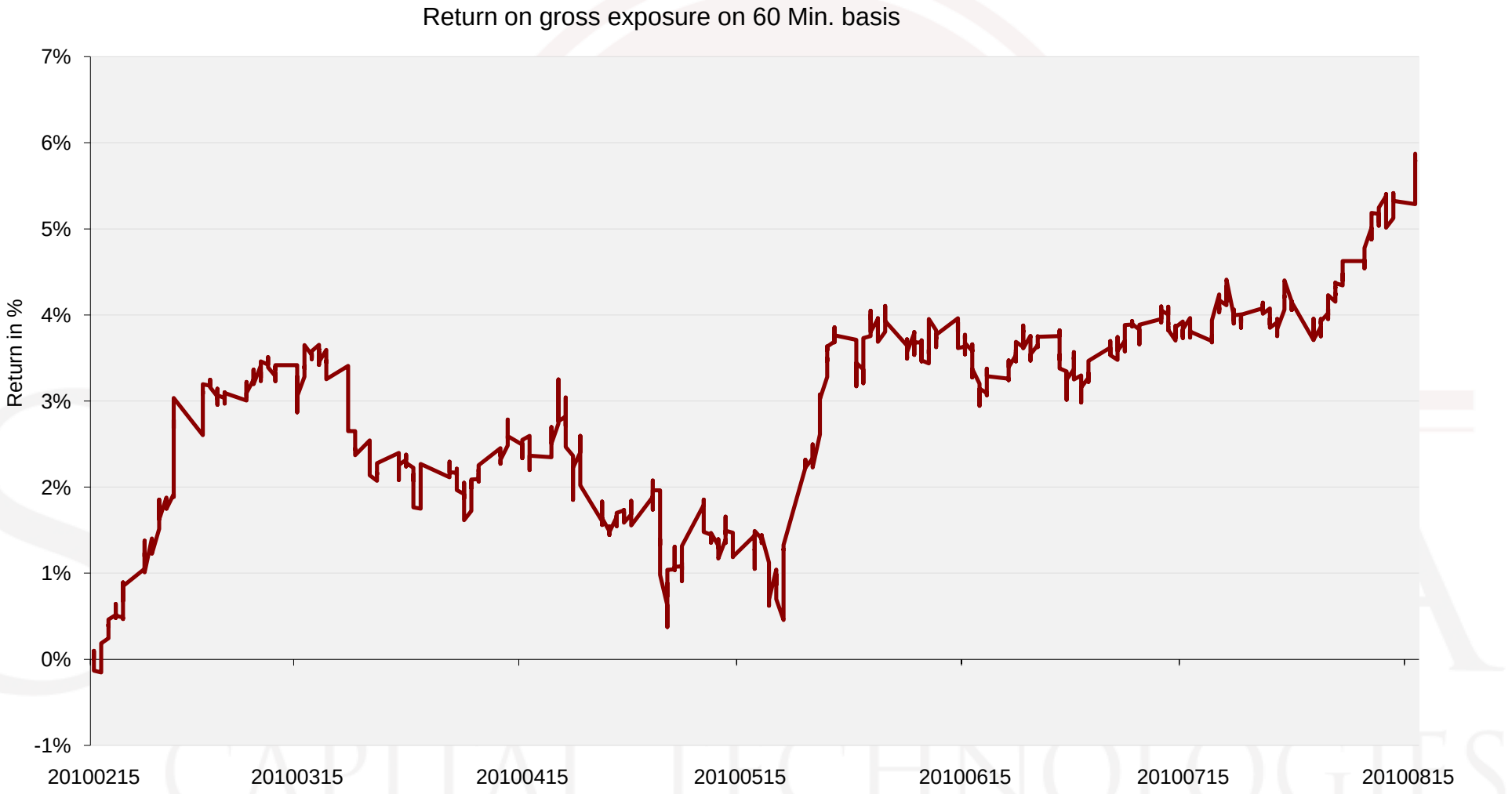
Summary

- High frequency stat-arb in single stock futures by
- Tracking 214 pairs, 22 sectors and 90 liquid stock futures
- Taking the mean, std and other factors over 60 min. time interval
- Entering the trade at Z-Score < -2 and other statistical filters
- Unwinding the trade at convergence to the mean of 20 periods (calculated over 60 min. interval)

Key numbers	Values
Annualized Return	11.13%
Annualized Std. Dev. In Return	4.85%
Annualized Sharpe	2.29
Max peak to trough drawdown (day-to-day basis)	-2.40%
Max flat period (Days)	65
Gross return per trade (average, BP, after 5 BP slippage)	23.06
Net return per trade (average, BP, after STT costs)	18.81
Average Holding Period (in hrs)	12.37
Hit Ratio (% of winning trades)	69.34%
Backtest period	Feb'2010 - Aug'2010
Number of potential statistical baskets and pairs	2000
Average deployment per pair (USD)	8000
Opportunity in a day (10% of the total available statistical pairs)	200
Average daily notional on baskets and single stocks (USD)	6,400,000
Approx annualized P&L (USD)	712,068

SAMSSARA

Equity curve of high freq stat-arb on 60 min. time period



Medium frequency stat-arb on daily time period

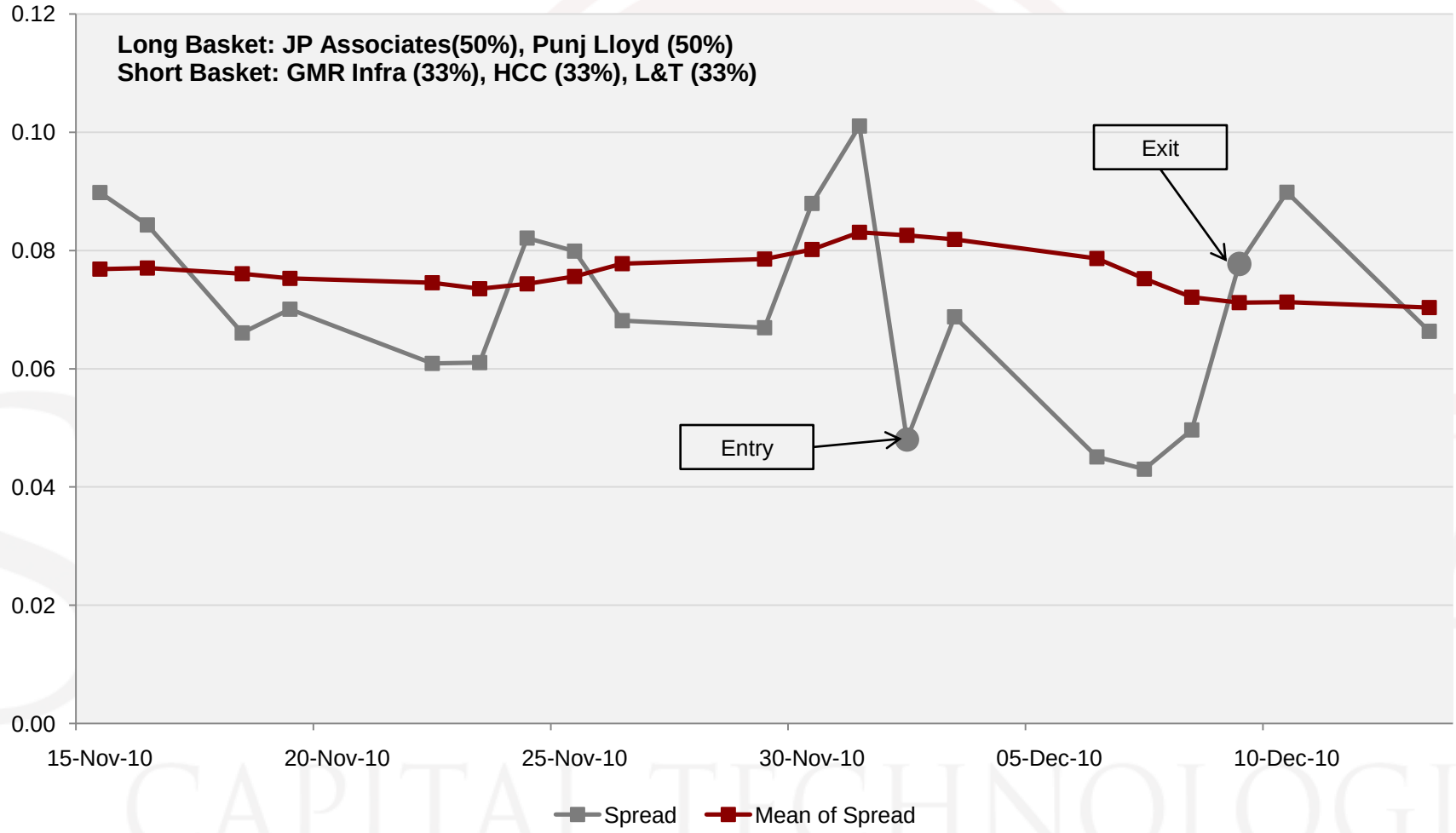
Summary

- Medium frequency stat-arb in baskets of stock futures by
- Tracking 684 pairs, 22 sectors and 108 liquid stock futures
- Taking the mean, std and other factors over daily time interval
- Entering the trade at Z-Score < -2 and other statistical filters
- Unwinding the trade at convergence to the mean of 20 periods (calculated over daily interval)

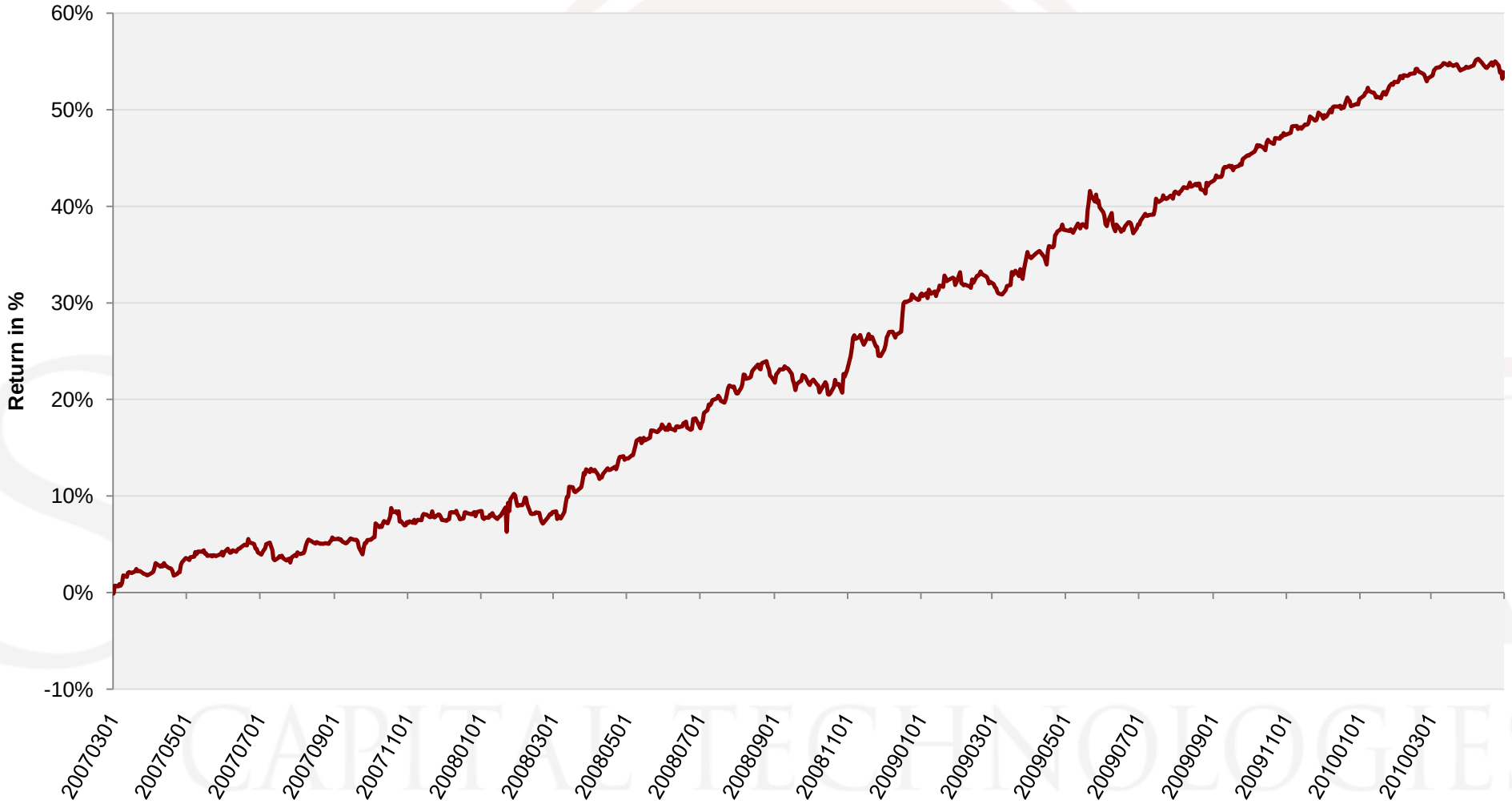
Key numbers0	Values
Annualized Return	15.26%
Annualized Std. Dev. In Return	7.09%
Annualized Sharpe	2.15
Max peak to trough drawdown (day-to-day basis)	-3.50%
Max flat period (Days)	125
Gross return per trade (average, %, after 15 BP slippage)	1.50
Net return per trade (average, %, after STT costs)	1.46
Average Holding Period (in days)	11.45
Hit Ratio (% of winning trades)	74.40%
Backtest period	Mar'2007-Mar'2010
Number of potential statistical baskets and pairs	2,000
Average deployment per pair (USD)	20,000
Opportunity in a day (5% of the total available statistical pairs)	100
Average daily notional on baskets and single stocks (USD)	22,000,000
Approx annualized P&L (USD)	3,357,553

SAMSSARA

E.g.: Basket trading in medium frequency



Equity curve for medium frequency stat-arb



Synthetic Index-arb on daily time period

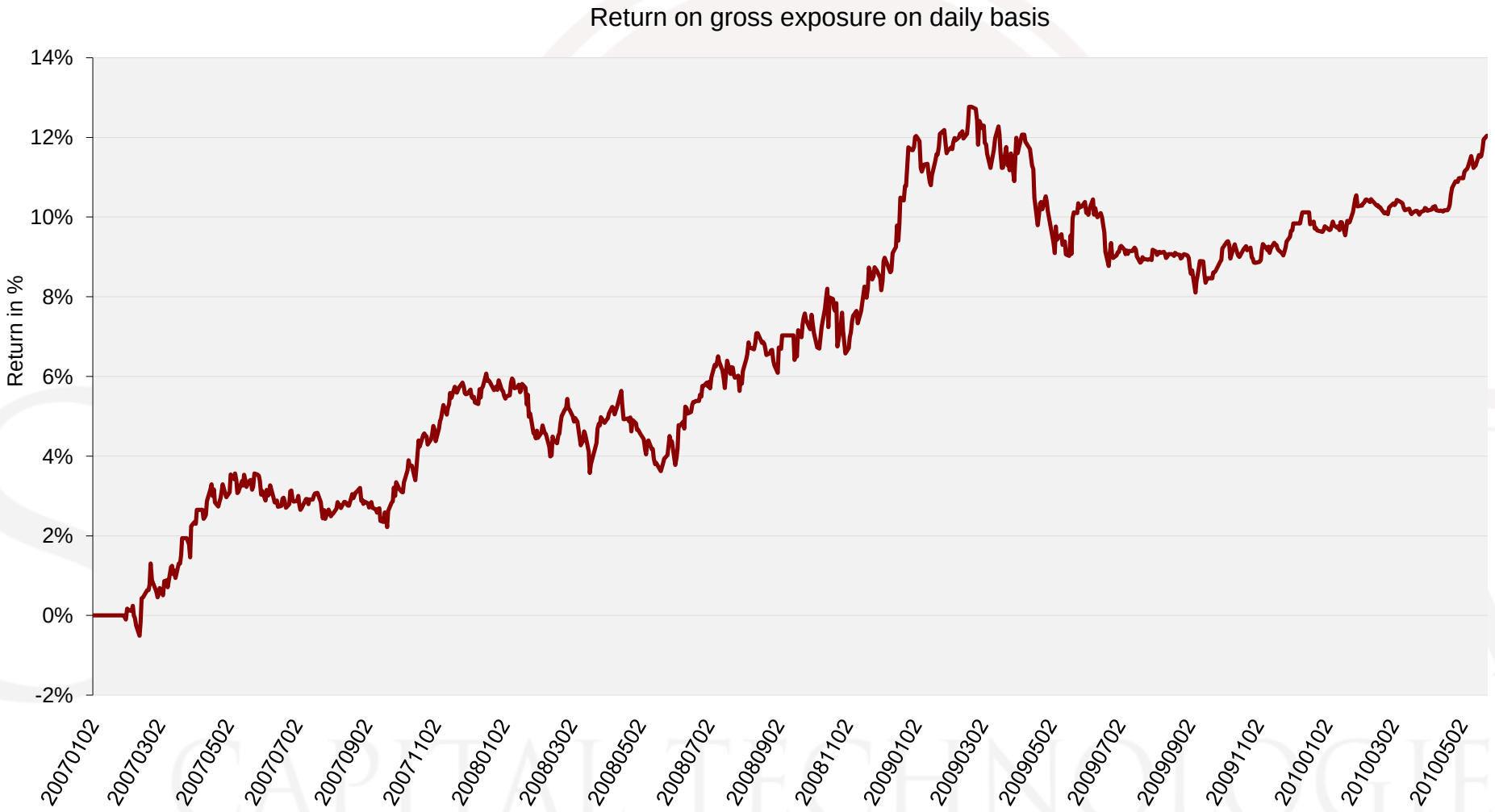
Summary

- Medium frequency Index-arb on synthetic baskets vs Nifty futures by
- Creating synthetic baskets by taking 10 stocks in Nifty50 and their weights as per sector weights in Nifty50
- Taking long positions on the cash baskets and shorting Nifty futures
- Taking the mean, std and other factors over daily time interval
- Entering the trade at Z-Score < -2 and other statistical filters
- Unwinding the trade at convergence to the mean of 20 periods (calculated over daily interval)

Key numbers	Values
Annualized Return	3.80%
Annualized Std. Dev. In Return	3.87%
Annualized Sharpe	0.98
Max peak to trough drawdown (day-to-day basis)	-3.90%
Max flat period (Days)	500
Gross return per trade (average, BP, after 5 BP slippage)	0.34
Net return per trade (average, BP, after STT costs)	0.30
Average Holding Period (in days)	11.64
Hit Ratio (% of winning trades)	72.12%
Backtest period	Jan'2007-May'2010
Number of potential statistical baskets and pairs	100
Average deployment per pair (USD)	40000
Opportunity in a day (10% of the total available statistical pairs)	10
Average daily notional on baskets and single stocks (USD)	4,400,000
Approx annualized P&L (USD)	167,365

SAMSSARA

Synthetic Index arbitrage equity curve



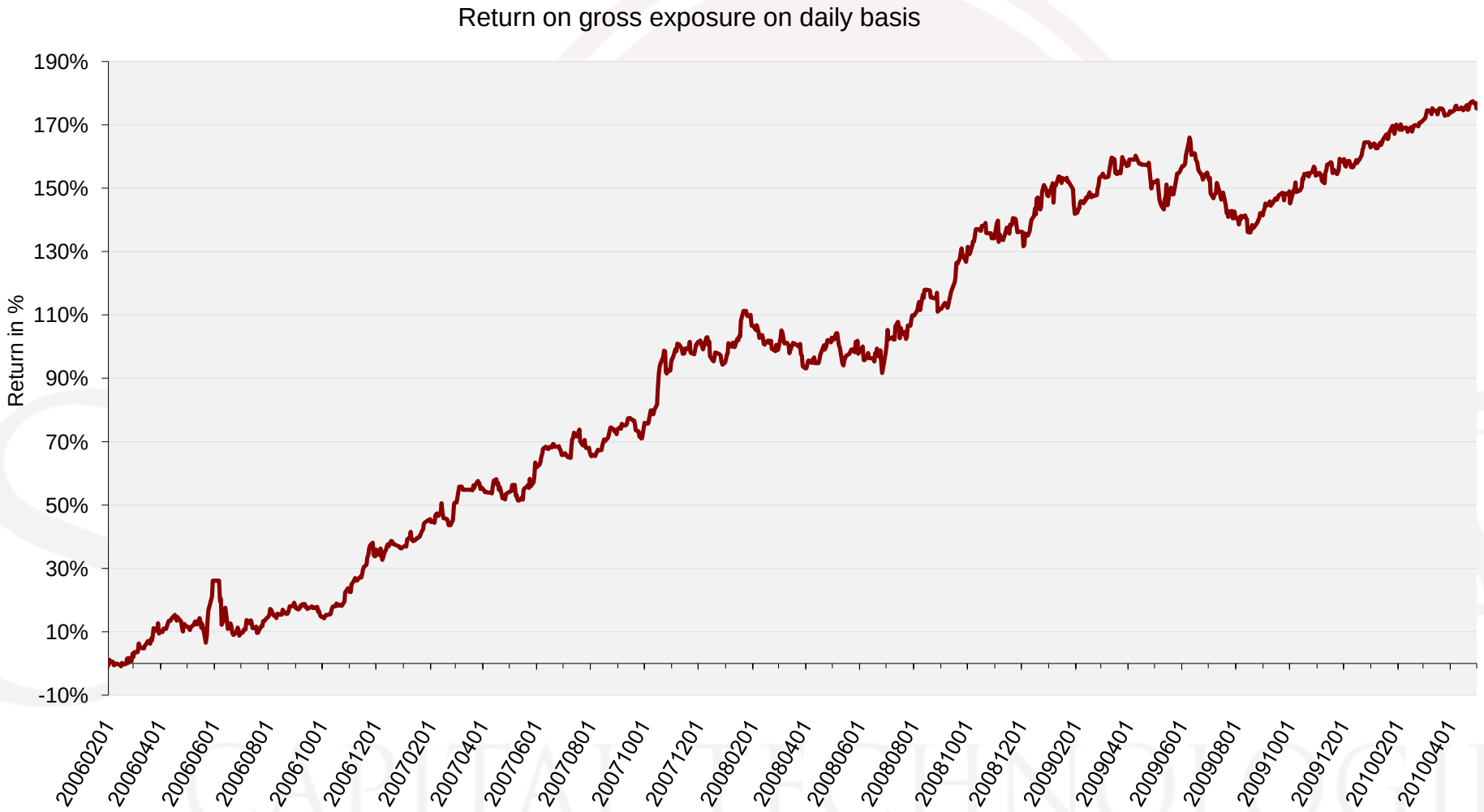
BTST-STBT Strategy on Nifty50

Summary

- BTST-STBT strategy on Nifty50 traded by
- Taking all positions and unwinding in last 30 min. of trading session in Indian markets
- Going long the top 10% outperforming and shorting the bottom 10% underperforming stocks
- Eliminating low probability trades using statistical filters and hence strategy is not 100% delta natural
- Unwinding the trades on next day in the last 30 min of the trading session and re-entering fresh trades

Key numbers	Values
Annualized Return	40.91%
Annualized Std. Dev. In Return	18.26%
Annualized Sharpe	2.24
Max peak to trough drawdown (day-to-day basis)	-24.00%
Max flat period (Days)	180
Gross return per trade (average, %, after 5 BP slippage)	0.19
Net return per trade (average, %, after STT costs)	0.17
Average Holding Period (in days)	1.00
Hit Ratio (% of winning trades)	54.14%
Backtest period	Mar'2006-Mar'2010
Number of potential single stocks	10
Average deployment per stock (USD)	40,000
Opportunity in a day (80% of stocks in the universe)	8
Average daily notional on baskets and single stocks (USD)	320,000
Approx annualized P&L (USD)	130,925

Equity curve for BTST-STBT on Nifty50



SAMSSARA

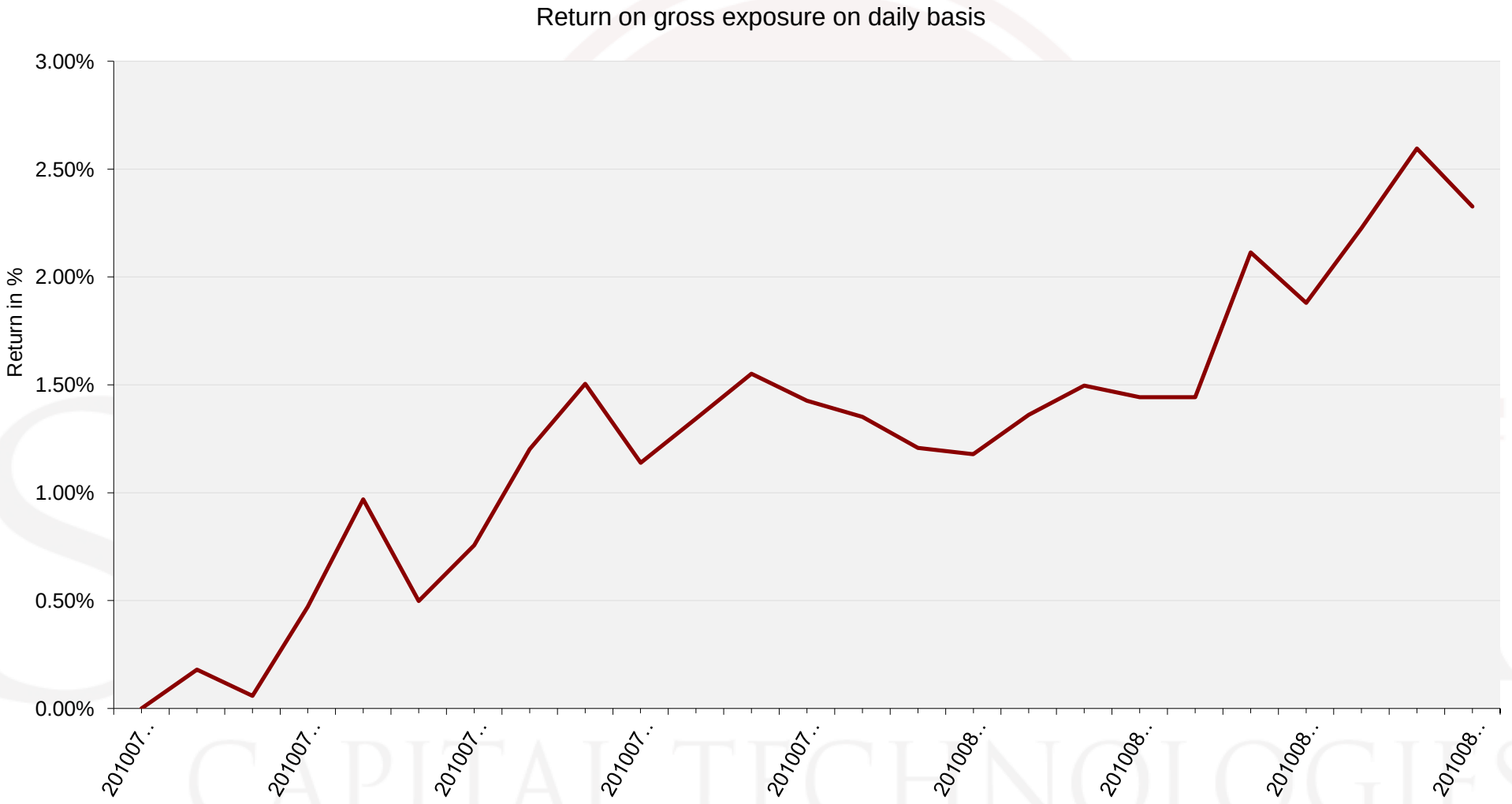
Intraday momentum strategy

Summary

- Intraday momentum strategy on Nifty50 stocks by
- Capturing the one-sided momentum in single stocks in the market post morning session
- Taking positions in the stocks between 12:00 PM -1:00 PM and unwinding between 3:00 PM – 3:30 PM
- Going long the top 10% outperforming and shorting the bottom 10% underperforming stocks in Nifty50
- Eliminating low probability trades using statistical filters and hence strategy is not 100% delta natural

Key numbers	Values
Annualized Return	24.44%
Annualized Std. Dev. In Return	4.65%
Annualized Sharpe	5.26
Max peak to trough drawdown (day-to-day basis)	-0.45%
Max flat period (Days)	15
Gross return per trade (average, BP, after 5 BP slippage)	15.39
Net return per trade (average, BP, after STT costs)	11.14
Average Holding Period (in hrs)	3.00
Hit Ratio (% of winning trades)	58.45%
Backtest period	Jul'2010 - Aug'2010
Number of potential statistical baskets and pairs	10
Average deployment per pair (USD)	40000
Opportunity in a day (80% of stocks in the universe)	8
Average daily notional on baskets and single stocks (USD)	320,000
Approx annualized P&L (USD)	78,205

Intraday momentum in Nifty50 stocks



Summary of all strategies – the huge potential

Strategy	Risk	Sharpe	Return p.a.	Conservative estimate on annualized profitability (USD)
High freq stat-arb in 30 min. time period	• Increased competition • High Intra-day momentum • Single stock events	3.38	20.78%	498,784
High freq stat-arb in 60 min. time period	• High daily momentum in the market • Overnight single stock events	2.29	11.13%	712,068
Medium frequency stat-arb on daily time period	• High monthly momentum in the market • Overnight single stock events • Sector concentration	2.15	15.25%	3,357,553
Medium frequency synthetic Index-arb on daily time period	• Single stock events • Very competitive • Risk of too many players holding similar positions	0.98	4%	167,365
BTST-STBT strategy on Nifty50	• Net delta overnight risk • Single stock news during market hours • Large peak to trough draw-down	2.24	40.91%	130,925
Intraday high-frequency momentum on Nifty50	• Net delta risk for 2.5 hrs of stock holdings • Single stock news during market hours • Market driven by news in opposite direction	5.26	24.44%	78,205

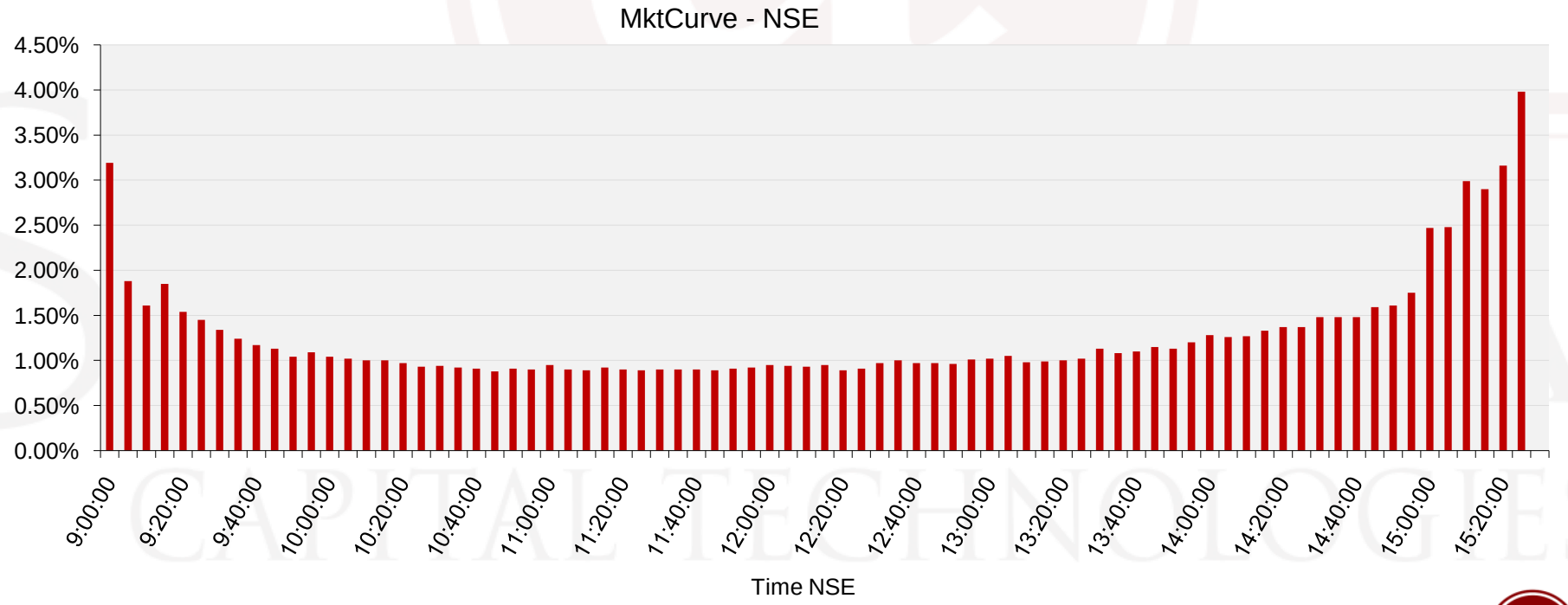
A note on the strategies – execution methods are the key

- Capture “breadth” not “depth”
- Signals and noise exists in Indian market for longer period of time
- Calculate slippage w.r.t . to the LTP / mid-price before executing market orders
- Consider order book depth – as tighter spreads exists in only the most liquid 30 stocks
- Execute pure arbitrage strategies with low-latency infrastructure
- High frequency trading strategies: Index Options, Commodities, Currency futures
- Medium to Low frequency strategies: Equities (Most liquid 215 names)

Agency execution in Indian market

VWAP-TWAP strategies – no standard benchmarks domestically

- No standard bench marks on VWAP/TWAP slippages published
- General norm is an average slippage of 4-5 BP with Std. Dev. of 20 BP
- Most VWAP orders are sent for beating last 30 min. VWAP price (MoC price)
- Tier 1 brokers domestically focusing on TWAP E.g.: Orion from Edelweiss
- Most VWAP strategies restricted to top 30 liquid stocks



SAMSSARA

Liquidity and Scalability of strategies

Scalability in Indian market – no depth huge breadth

Approximate Scales of statistical arbitrage strategies in Indian market

- Intraday stock futures statistical arbitrage: Turnover of USD 5 Mn. – USD 10 Mn.
- Short term holding of 1 to 2 days: 3 – 5 Mn. USD notional value
- Medium term holding of 5 to 10 days: 5 Mn. To 25 Mn. USD
- Longer term holding of 10 days to 1 month: 25 Mn. USD to 75 Mn. USD
- Monthly re-balance and factor model: 100+ Mn. USD

The Liquidity scale

- Strategies have to be modified to have larger value allocation to
- Top 30 liquid stock futures (Turnover of > USD 20 Mn. Per Day)
- Thereafter, 30 – 100 stock futures (Turnover of USD 5-20 Mn. Per Day)
- Lastly, 100-200 stock futures (Turnover of USD 1-5 Mn. Per Day . Can be avoided too)
- Huge opportunity in trading intra-day options: Extremely liquid and is driven by large movements in premiums

Source: Celent Research

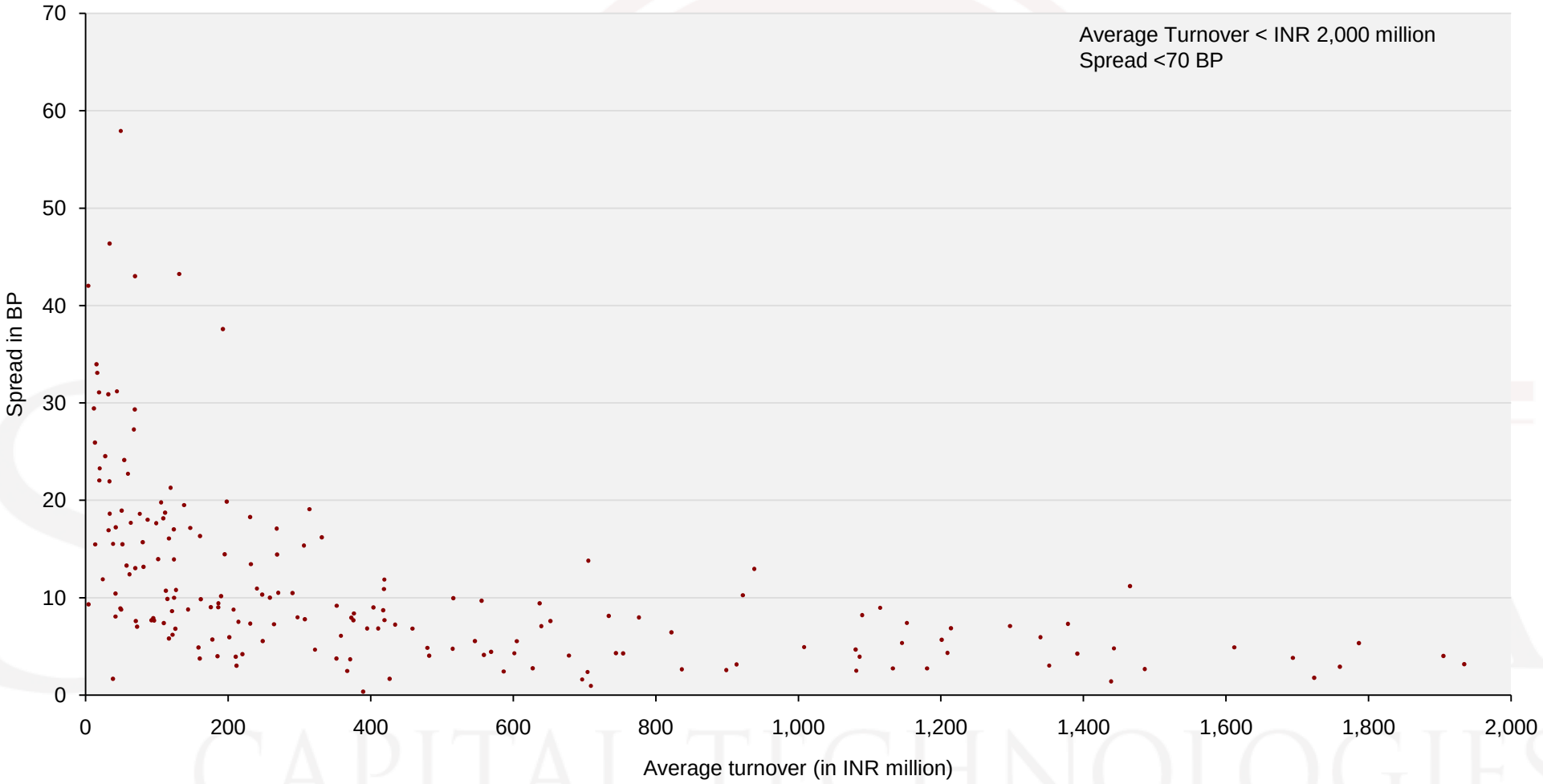
Liquidity in near, next and far month (1/2)

Index Futures					
	Average daily volume	Contract size	Contract Value	Average daily turnover (million)	Currency
Nifty Index					
Near	489,350	50	294,848	144,283.6	INR
Next	19,416	50	296,113	5,749.4	INR
Far	1,025	50	297,340	304.9	INR
SGX S&P CNX Nifty					
Near	23,042	2	11,798	271.9	USD
Next	27	2	11,830	0.3	USD
Far	na	2	12,005	na	USD
CNXBANK Index					
Near	81,124	25	282,825	22,944.0	INR
Next	1,478	25	284,000	419.9	INR
Far	25	25	283,750	7.2	INR

Liquidity in near, next and far month (2/2)

Stock Futures			
	Near	Next	Far
Average daily # of contracts	723,245	154,415	1,669
Average daily # of contracts per futures	3,243	692	8
Weighted average daily # of contracts per futures	2,544	594	7
Average daily turnover (INR million)	199,770	43,253	462
Average daily turnover per futures (INR million)	896	194	2

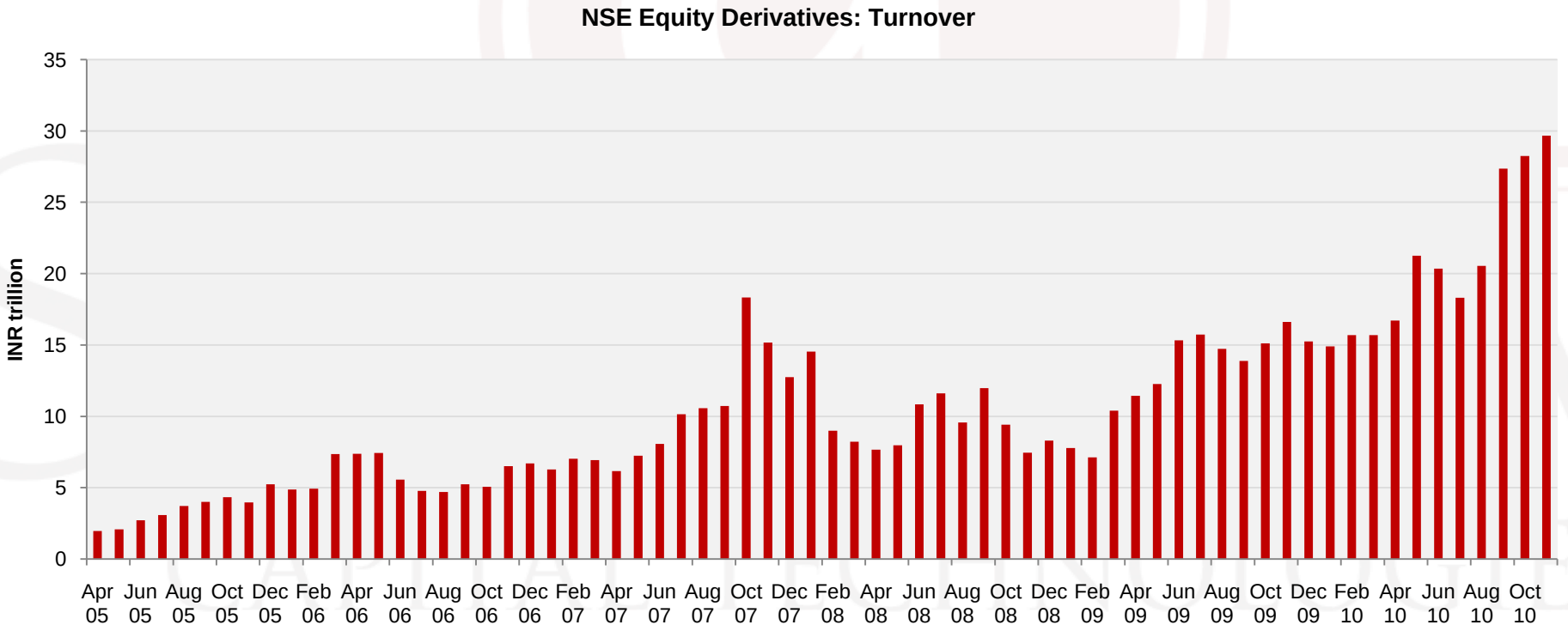
Spread in BP in top 200 stocks – lowest in Asia Pac



SAMSSARA

Equity Derivatives – the driver to most trading strategies

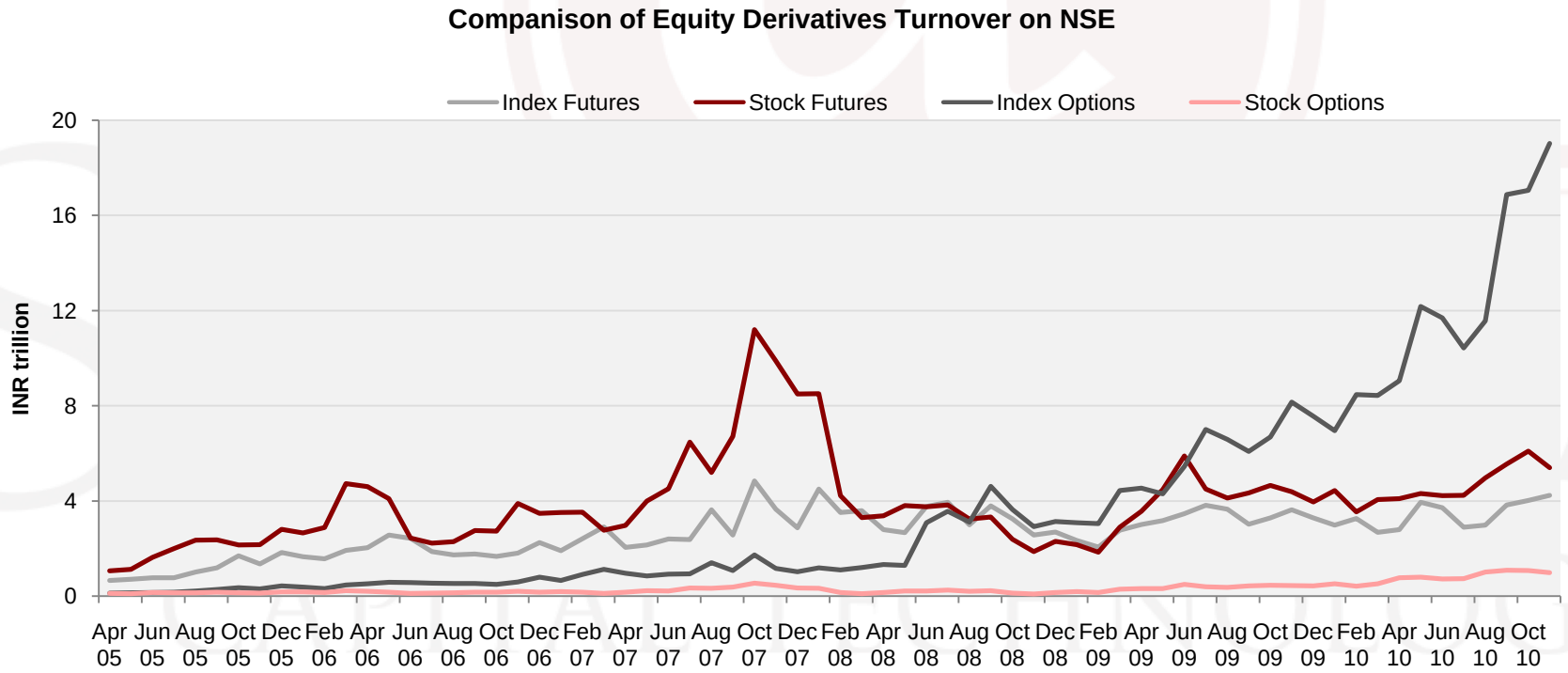
- Traded mainly on NSE; Volume/ Turnover on BSE is very small
- Nifty Index Options and Index Futures are among top 10 index derivatives worldwide
- Size of derivatives market is 5 times the cash market in India
- Popular because derivatives have provisions for leverage and short-selling as opposed to cash equities



Source: NSE

Derivatives in India – all focus on Index options

- Growth in Index options in the last 2 years has out-spaced all other derivatives segment in India
- Growth attributed to large funds hedging using options
- STT cost in options applicable on the premium value – not on notional (High-frequency advantage)
- Single day large movements of several 100% on the premium due to large intra-day volatility

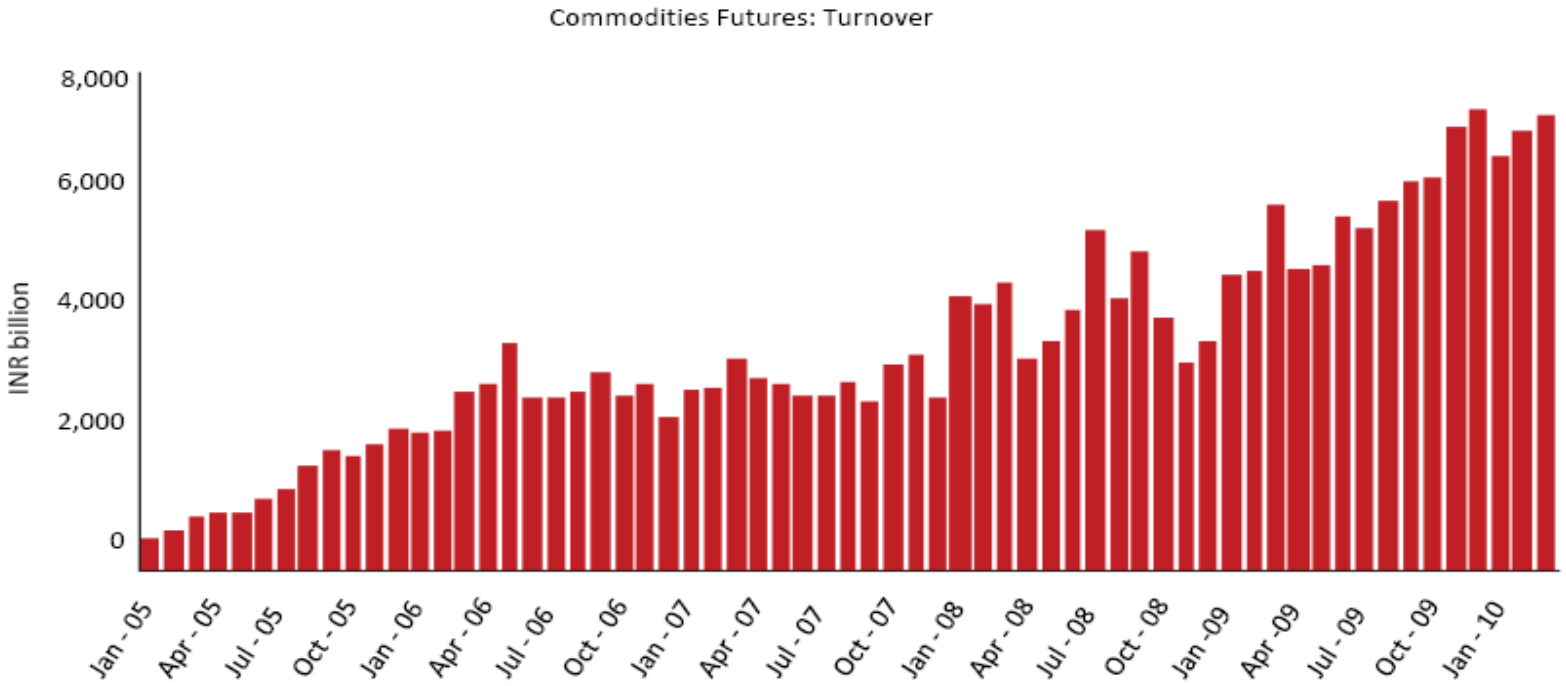


Source: NSE

SAMSSARA

Commodity Derivatives – the steadily rising opportunity

- Traded mainly on MCX and NCDEX
- MCX has 6 contracts in top 20 metal futures and options contracts globally (E.g.: Gold and Silver)
- 2 contracts in top 20 energy futures and options contracts (Crude and NG)
- FII not allowed to trade in Indian commodity markets directly
- Focus: CME/LME lead-lag effects (One leg high-frequency arb), Short term trend followings
- Pure arbitrage between CME/LME and MCX is illegal in India

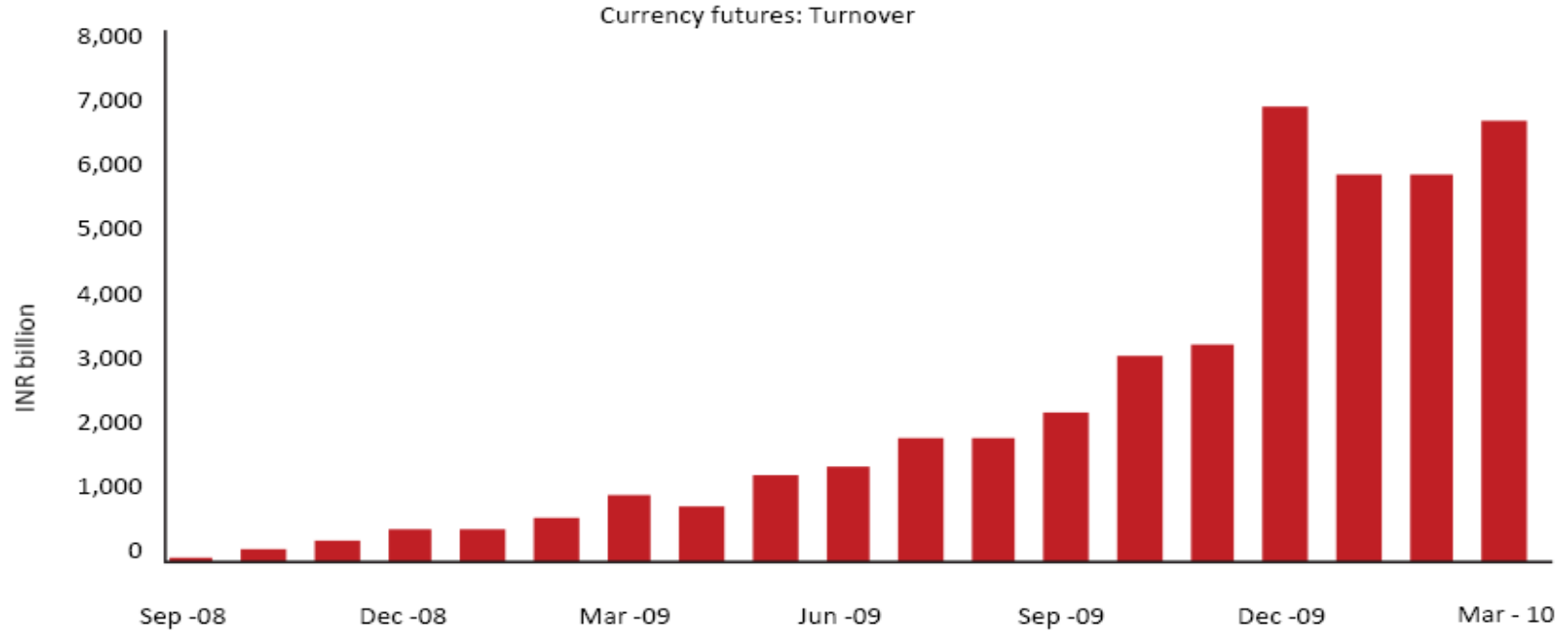


Source: Celent Research

SAMSSARA

Currency Futures – the steadily rising opportunity

- Currency futures were introduced in NSE and MCX-SX in August and October 2008.
- Introduced in USE in September 2010.
- USDINR futures contract on NSE and MCX-SX are the top 2 forex futures contracts globally
- Contracts are cash settled
- FII still not allowed to trade the currency futures directly
- Most activity in market making between USDEUR, USDJPY, USDGBP Vs USDINR
- Market is driven largely by intra-day activity

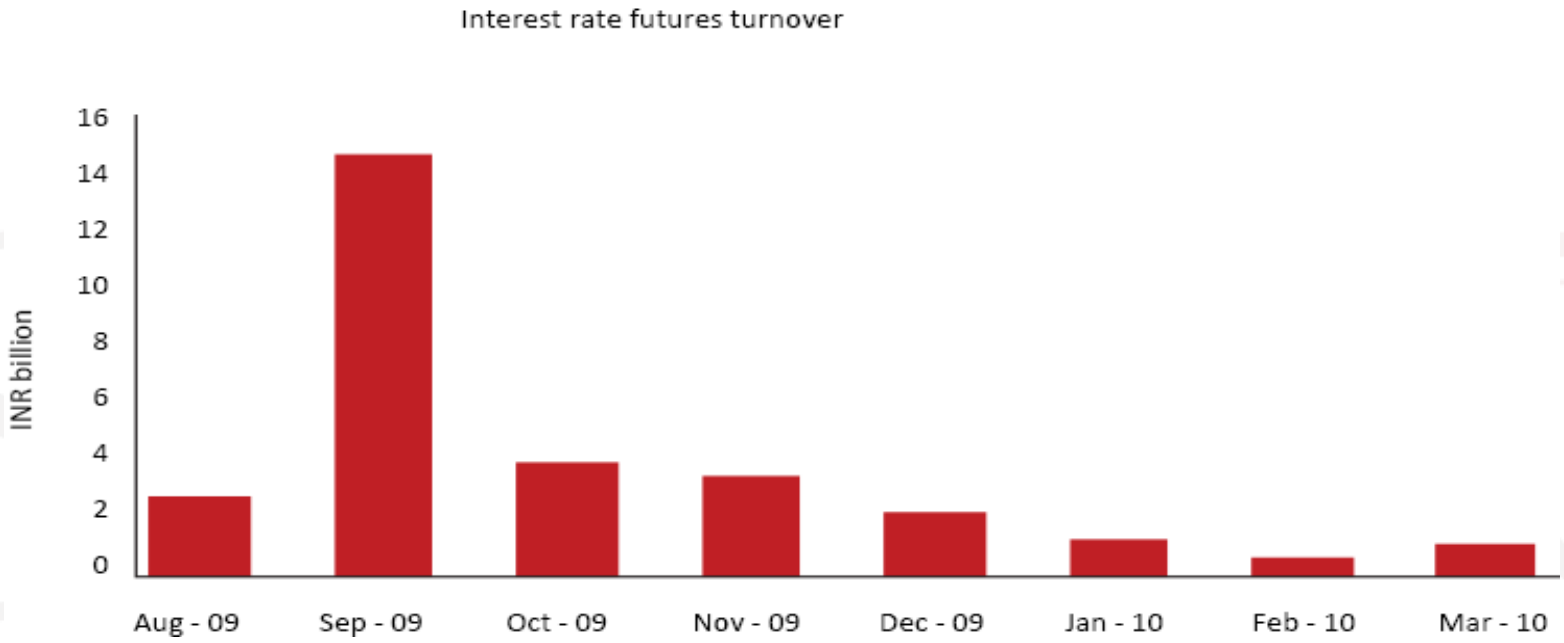


Source: Celent Research

SAMSSARA

Interest Rate Futures – tightly regulated

- Interest rate swaps and forward rate agreements introduced in 1999
- IRS attracted significant liquidity
- Turnover in interest rate futures at very low level
- RBI in discussions with market participants to try and revive the market



Source: Celent Research

The cost of trading

The trading costs – not a deterrent

STT Cost in BP			
Equity-Delivery	Purchase	12.50	Turnover
	Sell	12.50	Turnover
Equity-Intraday	Purchase	-	
	Sell	2.50	Turnover
Future	Purchase	-	
	Sell	1.70	Turnover
Option	Purchase	12.50	Settlement price, on exercise
	Sell	1.70	Premium

Transaction Charges in BP			
Equity-Delivery	Purchase	0.35	Turnover
	Sell	0.35	Turnover
Equity-Intraday	Purchase	0.35	Turnover
	Sell	0.35	Turnover
Future	Purchase	0.20	Turnover
	Sell	0.20	Turnover
Option	Purchase	5.00	Premium
	Sell	5.00	Premium

The trading costs – not a deterrent

SEBI Turnover Charges in BP			
Equity-Delivery	Purchase	-	
	Sell	-	
Equity-Intraday	Purchase	-	
	Sell	-	
Future	Purchase	0.02	Turnover
	Sell	0.02	Turnover
Option	Purchase	0.02	Premium
	Sell	0.02	Settlement price, on exercise

Overall in BPa			
Equity-Delivery	Purchase	12.85	Turnover
	Sell	12.85	Turnover
Equity-Intraday	Purchase	0.35	Turnover
	Sell	2.85	Turnover
Future	Purchase	0.22	Turnover
	Sell	1.92	Turnover
Option 1	Purchase	5.02	Premium
	Sell	6.70	Premium
Option 2	Purchase	12.50	Settlement price, on exercise
	Sell	0.02	Settlement price, on exercise

SAMSSARA

The brokerages, borrowing and margin – no real standards

- Very high brokerage on retail clients: 25 BP to 75 BP
- Brokerages in futures on very high volume usually is 1-2 BP
- Short sell borrowing started by some domestic brokers
- Very high borrowing cost of 50 BP to 2% (Illiquid stocks)
- F&O Margin: SPAN + Exposure ~ 20% to 33% of the notional value
- Cost of funding in India: Set by RBI
- Bank rate of 6.5%

Setting domestic desk for trading – favorable in pockets

Factors	Onshore	Offshore	Comment
Capital Gain Tax	10%	NA	If trade unwinded within 1 year
Income Tax	30%	Contingent on country	Income taxes in India is very high
Cost of funding	>6.5%	Contingent on country	Very high cost of funding domestically
Pure equity trading	Non-favorable	Favorable	High tax and cost of funding
Short selling	Favorable	Non-favorable	FII's restricted to short-sell in equities
Cross exchange Arb	Non-favorable	Favorable	
Commodity Trading	Favorable	Non-favorable	FII's restricted on MCX commodities
Interest rate and currency trading	Favorable	Non-favorable	FII's restricted on interest rate and currency trading
Electronic trading	Non-favorable	Favorable	Lots of approvals required domestically
Skill-sets	Favorable	Favorable	Many Indians globally looking to shift back

The co-location – in nascent stage

- Settlement procedures in India
  - Stocks settlement is T+2
  - Short deliveries: Buy-in auction on T+3 days and settlement at T+4
  - Clearing body: National securities clearing corporation ltd (NSCCL)
- Co-location
  - Cost of Co-location in NSE: USD 40,000 annually
  - Cost of Co-location in BSE: USD 10,0000 annually
  - Latency: Trade roundtrip of 5 ms. is promised (In reality 20-100 ms.)
  - Black-box algos: Proposal evaluated by NSE in 2 weeks
  - About 60 pre-trade risk parameters are tested
  - Throttle bottleneck set by NSE at 500 trades per second

The pricing mechanism

Open auction mechanism – a good start

- Collection Period: From 9:00 AM place bid/ask orders for first 7 min.
- Exchange discovers indicative price for stocks and index
- Based on indicative prices traders can change bid/ask
- Matching Period: At 9:08 AM – 9:12 AM orders are matched
- No new order / order modifications allowed in matching period
- Opening at 9:15 AM: Opening at price where maximum shares gets traded
- Applicable to only Nifty50 and Sensex stocks
- Derivatives market open at 9:15

Settlement prices – nothing much has changed

- Futures, Daily settlement: VWAP price of the last 30 min. of trading
- Futures, Final settlement: Closing price of the underlying security
- Options, Exercise/Final settlement: Closing price of the underlying security

About Samssara Capital Techologies LLP

About Samssara Capital Technologies LLP

COMPANY BACKGROUND

- Samssara Capital Technologies LLP ("Samssara") is an investment solutions firm focused solely on developing automated algorithmic and quantitative trading and investment strategies
- It was launched in 2010 by a team of IIM Ahmedabad and IIT Bombay graduates - Rajesh Baheti, Manish Jalan and Kashyap Bhargava
- Samssara caters to its clients' needs of providing an alternative asset management vehicle, with the focus on 100% automated and quantitative trading strategies
- The team at Samssara works on mathematical models and statistics that identify repetitive patterns in equity, commodity and currency markets
- The addressable market for Samssara is global - as the firm can develop and build models which can function in both developing markets with limited competition and developed markets with strong competition
- Samssara's client base includes the leading international and domestic banks, international and domestic stock brokers, family offices, corporate treasuries and HNIs

PRODUCTS OFFERED

- Samssara's products vary from pair trading (statistical arbitrage), factor models, Nifty Index beating products to very high frequency trading strategies
- samCAP, a key product offered by Samssara, is a factor model, where the model identifies a basket of stocks in Nifty that tend to outperform the index and takes a long position in these stocks. Alongside, the product also hedges the investor's portfolio using Nifty futures – whenever the market turns bearish
- Other products offered include samTREND - a trend following strategy in equities, commodities & currencies and samWILLS – a long-short strategy based on statistical arbitrage
- Samssara also develops in-house products which are used by investors like HNI's, corporate treasuries, Prop houses of brokers and investors who wants an alternative vehicle for investment apart from equities and fixed income.
- The products are designed to generate consistent returns and ride the volatility of the markets with systematic approach
- Additionally, Samssara works on providing high end services and strategy development consultancy to hedge funds and International Banks globally

Contact us

Manish Jalan

M: +91 98678 32726
D: +91 22 6748 7720
E: manish@samssara.com

Tarun Soni

M: +91 98692 17190
D: +91 22 6748 7720
E: tarun@samssara.com

Head Office:

208/209, Veena Chambers
21 Dalal Street
Mumbai – 400 001

Development Office:

207, Business Classic,
Behind H P Petrol Pump,
Chincholi Bunder Road, Malad (W)
Mumbai – 400 064

For more information do visit : www.samssara.com