

Derivatives Dynamics: Looking Back & Looking Ahead¹

Prof. Sesha R. Iyer, Prof. Suresh G Lalwani, Prof. Ranjit Pattanaik and learned panellists & invitees. I am happy to be here today on the occasion of the Finance Conclave 2015 on 'Indian Derivatives Markets – Striking a Balance between Risk Protection and Liquidity' organized by the SP Jain Institute of Management & Research and share some of my thoughts on the dynamics of derivatives in the Indian context.

2. 'Derivatives' have for quite some time been a totem of expertise for anyone connected with finance, be it a market practitioner or a financial economist or a financial sector regulator. Part of the interest no doubt stems from the usefulness of the derivatives, but a large part of interest is actually a form of pure wonder of incomprehension owing to the complexity of its valuation, design and risk implication. Be that as it may, derivatives at various times have evoked quite extreme reactions from thought leaders in the field. Warren Buffet is reported to have described derivatives as, *"financial weapons of mass destruction, carrying dangers that, while now latent, are potentially lethal."* Similar sentiment has been echoed by George Soros, while advising people to avoid derivatives, *"....because we don't really understand how they work."* At the other end of the spectrum, former Federal Reserve Chairman Alan Greenspan, a steadfast defender of derivatives, said in a Senate Committee hearing *"What we have found over the years in the marketplace is that derivatives have been an extraordinarily useful vehicle to transfer risk from those who shouldn't be taking it to those who are willing to and are capable of doing so"*. The Global Financial Crisis (GFC) had spurned a large volume of literature laying much of the blame for the crisis at the door of indiscriminate use of derivatives, pointing out the dangers inherent in derivatives and underscoring the need for further regulating the market. Immediate aftermath of a crisis was not a good time to take a balanced view, and now that much of the dust has, somewhat settled down, we can perhaps look at the problem dispassionately.

Financial Sector & the Derivatives

3. Before we go to the theme of derivatives, it is necessary to briefly discuss the financial sector as such so as to provide a backdrop, as it were. It has been generally accepted that a financial sector is a necessary precondition for economic growth and progress. Economists like John Hicks, Walter Bagehot and Joseph Schumpeter have held that the development of financial sector helped mobilize the resources necessary for 'the immense work' that constituted the industrial revolution. Of course, like everything else in economics, this also has a contrary view point. Economists Joan Robinson and Robert Lucas have expressed scepticism about the emphasis given to the financial sector. Extensive research in recent years goes to show that a well developed financial sector may be neither a necessary nor a sufficient condition for

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economic growth but the absence of an efficient financial sector can surely retard growth.

4. The financial sector essentially enables inter-temporal transfer of income and smoothens the consumption over the life time of an individual. On the other side, it also pools the surplus and allocates it to various socially productive projects which require an upfront outlay with the potential of generating a surplus at the end of the production cycle. It involves parting of money from the one who has the surplus to the one who needs it. But it could be a dangerous proposition. It is for nothing that Polonius counsels his son Laertes in Shakespeare's Hamlet, "*Neither a borrower nor a lender be*". The legal-financial system that has evolved over the centuries has developed an elaborate architecture to ensure that the trust of the people is maintained in the financial system and they lend and borrow their requirement freely and safely. The financial sector has basically two kinds of problems. The first relates to information asymmetry inasmuch as one party to the transaction, the borrower or the investee, always knows more than the other party, the lender or the investor. This is a large topic in itself which I do not intend to deal with here, except that it also lays the ground for the second problem in financial transactions, that is, the risk of default or more generally the risk of erosion in the value of the asset. A smooth functioning of the financial system requires that this problem is adequately addressed.

5. Derivatives play an important role in addressing the risk inherent in financial transactions. A derivative has traditionally been defined as a contract whose value derives from and is dependent on the value of an underlying asset, such as, a commodity, currency, or security. The concepts of various derivatives have been known since antiquity – the oft-cited anecdote of the sixth century BC philosopher Thales buying options on olive pressing mills is too well known to recount here. Various forms of derivatives – mostly forwards and futures – have traded off and on in the seventeenth and eighteenth centuries, for example, forwards on tulips and futures in the Yodoya rice market in Japan. The major milestones in the history of derivatives are the establishment of the Chicago Board of Trade (CBOT) (1848), establishment of the Chicago Produce Exchange (1874), which was converted to Chicago Mercantile Exchange (CME) (1919) and the formation of futures clearing houses (1925). I may mention in passing that notwithstanding the increasing activity in the commodities derivatives markets, there were always apprehensions about the impact of derivatives trading on the cash market which led to frequent bans on commodity derivatives.

6. The history of derivatives on financial securities is rather short. Following the breakdown of the Bretton-Woods, which led to floating exchange rates, the CME introduced the first currency futures in 1972. In 1975 CBOT created the first interest rate futures contract to which CME responded with Treasury bill futures contract in 1975. In 1977, CBOT created the first treasury bond futures contract. In 1982, Kansas City Board of Trade launched the first Stock Index futures followed by the CGOT's futures contract on S&P 500 index in the same year. In 1983, the Chicago Board of Exchange (CBOE) introduced an option on an index of stocks.

7. During the 1990's, there was huge outcries over a series of debacles over derivative trading with market participants reporting large losses. The cases of Proctor & Gamble (swaps), Showa Shell (forwards) Metallgesellschaft (futures), Allied Irish Bank, Barrings Bank (options)& Orange Country(swaps) have become standard case

studies in the academic curriculum. The discourse that followed sometimes blamed the products and often the entities trading these products. The markets continued more or less in the same vein but the trading and risk management protocols amongst the market participants were tightened.

8. The GFC brought the focus back to the derivatives and their trading. What happened is essentially as follows. Innovative design of derivative instruments facilitated flow of large quantum of funds to the housing sector through sub-prime loans, fuelling a housing sector boom and when the housing prices started correcting, the derivative instruments too started losing value. Both forces interacted with and reinforced each other, and the snowballing effect brought the markets down. It has been argued that laying the blame for the crisis entirely on the derivative products is akin to a bad workman blaming his tools. The problem perhaps lied not so much on the instruments themselves, but on the inadequacy of the market infrastructure to deal with the opacity and complexity of these products and on the lack of appropriate risk management protocol amongst the financial institutions that traded and took position in these products. Let me quote Kenneth Arrow, who in an article in the Guardian, sums up the predicament rather succinctly when he says *'There have been two developments in the economic theory of uncertainty in the last 60 years, which have had opposite implications for the radical changes in the financial system. One has made explicit and understandable a long tradition that spreading risks among many bearers improves the functioning of the economy. The second is that there are large differences of information among market participants and that these differences are not well handled by market forces. The first point of view tends to argue for the expansion of markets, the second for recognising that they may fail to exist and, if they do come into being, may fail to work for the benefit of the general economic situation.'* And again, *'There is obviously much more to the full understanding of the current financial crisis, but the root is this conflict between the genuine social value of increased variety and spread of risk-bearing securities and the limits imposed by the growing difficulty of understanding the underlying risks imposed by growing complexity.'*

Dynamics of Derivatives Market

9. Before I deal with the Indian derivative markets, let me discuss some salient issues about the derivatives market in general. The market for financial derivatives, as indeed the market for any financial assets, is populated by three generic classes of participants: the hedgers, the arbitrageurs and the speculators. The hedgers are the final consumers, as it were. The arbitrageurs help establish the law of one price across market segments so that similar products with similar risk profiles cost the same in various markets *at any given point of time*. The speculators, a word with much negative connotations, essentially do inter-temporal arbitraging and serve a very useful economic function of price discovery, particularly in the financial markets. Inasmuch as the value of all financial assets is based on a view of the future, the act of speculation tends to correct the value of under-valued or over-valued assets. Caution, however, is invited by the fact that the future is uncertain, and leveraged speculation based on irrational exuberance is fraught with dangerous consequences as has been witnessed during many a crisis.

10. For the market participants, liquidity has talisman like significance. What is the meaning of liquidity? Trading volumes? Bid-ask spread? These are only indicators of liquidity. In an economic sense, liquidity means the ease with which a security or an asset can be converted to 'money' (bank and ultimately central bank liability) at the going price. It is a basic requirement of a market because an investor will hold an asset only if she is convinced that she will be able to sell that asset at the going price without the price tumbling by the act of her sale. Similarly one will be able to issue liabilities, assured that investors will buy it without a discount. Thus smooth functioning of the financial market requires liquidity. But at the same time, it must be understood that liquidity is not an end in itself that the market efficiency increases with increase in liquidity without any bound. Here I will like to quote Bob Solow on this. He says, "Much more significant is the fact that the bulk of incremental financial activity is trading, and trading, while it may provide a little useful public information about market opinion, is largely a way to transfer wealth from those with inferior information and calculation ability to those with more. There is no enhancement of economic efficiency to speak of." Hence it is necessary to keep the context of economic efficiency in view while talking about market efficiency.

Indian Equity Market & the Derivatives

11. Financial markets in India in the modern sense of the term have had a short history and are in a way in their nascent stage. You will recall that post-independence, in the plan-economy era, we had what has been called a regime of financial repression where the key economic variables were determined by fiat rather than through a market process. The financial markets evolved into their present form following the liberalization that started in the early nineties. The introduction of the floating exchange rate and deregulation of interest rates facilitated development of an active foreign exchange and fixed income securities market. It is true that India had perhaps the oldest stock market in Asia, with the Bombay Stock Exchange dating back to 1855. The stock market, however, saw quantum change following the scam of 1991. Securities & Exchange Board of India (SEBI) was formed in 1992, and NSE in 1992(it started operations in 1994). I will just mention two other landmarks: the introduction of the NIFTY futures on the National Stock Exchange (NSE) in 1998 and the SENSEX futures on the Bombay Stock Exchange (BSE) in 2000.

12. Equity markets are the quintessential representation of functioning of a market economy. They are the ultimate crucible for ideas such as corporate governance, investor protection, market discipline, etc., and the existence and success of a buoyant, robust corporate sector is critically dependent on the functioning of equity market. One can say with pride that notwithstanding the low ranking of India in the World Bank's list of countries in regard to 'ease of doing business', we rank 7th in the attribute 'protecting minority investors'. The equity markets in India today are among the best in the world, with state-of-the-art technology, institutional mechanism, and products. Apart from large daily volumes, we have other products such as equity derivatives, security lending and borrowing, algorithm trading, etc.

13. The main focus of concern in equity market is investor protection and integrity of trading. Equity derivatives, like all derivatives, can be used either to hedge an existing position or express a view on the equity prices or indices. Derivatives being

leveraged structures have the potential to amplify the loss or gain in an asset. For the same reason, it can also contribute to the volatility.

14. From a systemic financial stability perspective, the concern about the equity market stems from the source of financing equity positions. It is matter of great concern if bank lending funds an equity market boom, or for that matter, any asset price boom. This is an unforgettable lesson from the crash of 1929, further underscored by the GFC. Recognising this, the banking regulations cap banks' exposure to the equity markets.

15. When we come to foreign exchange and interest rate derivative markets, the perspective changes significantly. It is to be appreciated that interest rate and exchange rates are important macro-economic variables with economy-wide implications. The Reserve Bank of India has responsibility in regard to both the rates and is statutorily mandated to ensure sound functioning of these markets. Therefore, its approach to development the cash as well as derivative segments of these markets has been characterised by what one can call as *cautious gradualism*. I shall elaborate on the issues involved in these markets.

Foreign Exchange Derivatives

16. The backdrop for the foreign exchange market is provided by several factors following the Balance of Payment crisis we faced in 1991. Full current account convertibility since 1994, increasing openness on the capital accounts, a persistent and sometimes rapidly increasing current account deficit, the instability in autonomous capital flows, the investment needs of an expanding economy and globalization aspirations of Indian corporates are some of them. Our stated objective is to maintain orderliness in the foreign exchange market even as the exchange rate is market determined without any target level or band. The other factor one has to reckon with is the so-called impossible trinity where an independent monetary policy, a fixed exchange rate and an open capital account are impossible to simultaneously attain. Since no economy of India's size and complexity can sacrifice its independence in monetary policy, the inevitable consequence is an eclectic combination of some capital account openness and some flexibility in the exchange rate.

17. How does all this influence the development of the foreign exchange derivatives market? Our approach to development of the foreign exchange derivatives market has been largely biased by the use of these products as instruments of hedging for individuals and real sector firms with a pre-existing foreign exchange exposure. Take for example an exporter who has a foreign exchange receivable at a future date and any adverse movement is likely to adversely affect her expected Rupee revenue and therefore her balance sheet. A derivative product like a forward sale or a put option is designed to remove all or some uncertainty of the exporter's expected revenue and thereby impart stability to its balance sheet.

18. But a derivative product also is an instrument for expressing a view on the future path of the price of the underlying. Thus if you expect the Rupee to fall in value at a future date, you can sell it in the forward or futures market or buy a put option. This has the effect of depreciation in the spot exchange rate of the Rupee. Can this be called a justified correction in the spot exchange rate? It depends upon how justified

the expectation was in the first place. Expectations are often mechanical extrapolation of the immediate past. If Rupee starts depreciating for some reason, an expectation of further depreciation is engendered, derivatives provide the means to express this expectation, and expectations are often self-fulfilling. Any sharp depreciation of Rupee could lead to further panic reactions: exporters cancelling the forward sale contracts they had already booked and importers rushing to buy forwards to protect their future commitments.

19. As I have mentioned, exchange rate is an important macro variable and given the various factors affecting our external sector, our tolerance for large volatility or sharp movements is rather limited. In this background one can understand the regulatory framework for foreign exchange derivatives in India. Firstly, it has so far been mostly dominated by the OTC segment and derivatives have been meant as instruments of hedging. That is, an entity can enter into a derivative contract only if it has a foreign currency exposure. One party to the contract has necessarily to be an Authorised Dealer who is supposed to be the market maker. So as to ease the derivative transactions, we have been making operational relaxations, such as, buying or selling forwards or options on the basis of past performance as indicator of current and future exposure rather than having to produce evidence of underlying each time. But still, underlying exposure is the basic driver.

20. In 2008, currency futures started trading on the exchanges with a view to expanding the derivatives products, improving transparency and price discovery and affording an easy access to the foreign exchange derivative market. This brought in a kind of dichotomy in the foreign exchange derivative market. A futures market does not usually work on the basis of an underlying exposure. Moreover, there is free entry and exit and is cash settled. This is a perfect setting for anyone to express a view on the currency and it is quite contrary to the regime for the OTC market. It has been a usual response to sharp movements in the exchange rate to modulate the regulatory regime in the OTC market by disincentivising free booking and cancellation of contracts aimed at making gain out of the Rupee movement. But is such a thing possible in the futures market? That is why during the volatility episode in July 2013, restrictions were imposed in the futures market. These have been mostly undone and some extent of symmetry has been brought about between the OTC and the exchange traded segments of the foreign exchange derivative markets. An important step in this connection has been to grant access to the futures market to the foreign portfolio investors in an attempt to offer them a viable alternative to the overseas NDF market. To provide boost to the currency futures, some more relaxations like enhancing the limit upto which exposure will not require the proof of the underlying exposure & procedural simplification relating to documentation are being examined.

21. The Currency Futures volume that plunged post administrative measures taken by the Reserve Bank in July 2013 recovered after removal of the restrictions. The trading volume though remains lower than the pre-July 2013 levels (US\$ 3.2 billion in January 2015 so far vs. US\$ 7 billion in June 2013), the daily open interest position has improved to near pre-July 2013 level of about US\$ 4 billion. The trading in the Currency Futures, however, continues to be dominated by non-bank trading members (proprietary) and the brokerage firms (as clients). There are only a few corporates holding insignificant open interest in the currency futures. Though the effectiveness of currency futures as a hedging instrument remains low for several reasons, the product

enjoys complementarity with the OTC products in developed markets as counterparties to OTC transactions aggregate their exposures and cover them through exchange traded products (hub-and-spoke approach) which are quoted at narrow bid-offer spread. It is expected that with active participation of banks in currency futures, this complementarity will provide useful linkage between the OTC and exchange traded currency derivatives.

22. We are committed to the idea that the range of derivative products should be wide enough so that market participants are free to choose them according to their risk management strategy in a cost effective manner. Though options, mostly plain vanilla, have been allowed, their use has not been widespread. The average daily trading volume of forex options is just about US\$ 300 million. We are contemplating expanding the products available and considering allowing option trading strategies. In this context, it will be useful to note the use of various option structures by market participants during the period prior to the GFC. The currency market volatility and sharp movements in the aftermath of the GFC caused many of these entities to book heavy losses, which led to a spate of complaints and litigations. For that matter, the Rupee which has been mostly on an appreciating mode during 2007-08, suddenly reversed the trend post-Lehman and many exporters suffered large MTM losses even on simple forward contracts. This brings home the point I made earlier that the blame lies with unwise use of the derivative products linked to forex or otherwise for that matter other underlyings rather than the products themselves. While the firms using derivative products must have an adequate risk management framework comprising an understanding of the risk and the derivatives used to mitigate that risk, the banks also have a responsibility to offer products that are suitable & appropriate for their client's risk profile and risk management framework. This concern is sought to be addressed through mandating banks to ensure suitability and appropriateness of the derivatives products they are selling to their clients.

23. It is pertinent to mention briefly a theme current in contemporary discourse-Bond-Currency-Derivatives (BCD) nexus. This is an ideal objective in an open economy financial system. What it means is this: any foreign investor, using any international currency, can buy an Indian Government or corporate liability denominated in Rupees or otherwise and hedge all risks, either onshore or offshore, the attendant credit, interest rate & currency risks. This is a natural prerequisite for free international capital movements, and from an Indian perspective, for mobilisation of the much needed resources. The problem, however, is inherent in the proposition itself. This presupposes complete capital account openness, particularly for financial institutions & transactions. The pros & cons of full capital account openness is a contentious issue and in any case, we are not ready for it at this point of time. Thus the full BCD nexus has to wait on progress in capital account liberalisation. In the meanwhile, I must point out that BCD nexus is neither absolutely necessary nor a sufficient condition for mobilising resources for investment to support economic growth. I will just have to point out the growth story of post-war Japan, that of China of last two decades and even of India before the crisis to support this point.

Interest Rate Derivatives

24. In an economy with expanding financial sector, interest rate is a key variable that affects firms and individuals across the board. In the pre-liberalisation era, the interest rate was largely 'administered' and there was little need for hedging interest

rate risk. It must be appreciated that interest rate derivatives market is not a retail market. But the individuals and small firms do benefit out of an interest rate derivative market in so far as the financial institutions and market makers can hedge their interest rate risk and consequently offer better rates to their customers. Globally, the interest rate derivatives constitute the largest segment of the derivatives market.

25. Need for interest rate derivatives was recognised early and in 1999, guidelines were issued for two core products in the OTC segment: the Forward Rate Agreements (FRA) and the Interest Rate Swaps (IRS). The absence of a term money market has hampered the any meaningful growth of the interest rate derivative markets, except one product *viz.*, the Overnight Index Swaps (OIS), which has gathered large volumes. We have always been concerned about lack of a term money market and have taken some steps (e.g. introduction of term repos under Liquidity Adjustment Facility of the Reserve Bank of India, increasing the frequency of Bank's term repos to four times during a reporting fortnight, recent announcement for permitting re-repoing of government securities, etc.) to nudge the market participants in that direction. Hopefully, term money market and an active interest rate swap market will develop in tandem.

26. The need for an exchange traded interest rate derivative market was also felt pretty early. An exchange traded market, apart from transparency, price discovery, cost effectiveness, and better risk management, also provides a market where market makers can hedge their risk. The development of an active interest rate futures market has so far eluded us and the process can provide an interesting case study. The products were first introduced in 2003 which were cash settled and based on zero coupon yield curve. After some initial interest, the market liquidity completely dried up. In 2008, after the currency futures were introduced, interest in Interest Rate Futures (IRF) were revived and after wide consultations, physically settled futures contracts were introduced on 10-year Government bonds. This is a classic product and it was expected that it will attract market interest. This product too did not survive beyond its infancy. After a lull, a cash settled single bond futures contract was introduced in January 2014 and has been trading with reasonable liquidity. It is proposed to expand such contracts to other tenors. The volumes and open interest in such contracts is limited by the total outstanding of the respective bonds. In the recent times, the volumes have picked up significantly. The average daily volume rose from Rs.13.97 billion post-launch of single bond futures in January 2014 to about Rs.25.50 billion in January 2015 so far. More importantly, the open interest have registered steady growth in the recent period with average daily figure of Rs.63.60 billion during the current month so far. It is expected that this product will develop market's familiarity with the terrain and prepare it for more generic products in future.

27. The reason for lukewarm response in interest rate product partially lies in the structure of our debt markets. The government bond holding is concentrated amongst banks, insurance companies, provident/pension funds and the Reserve Bank of India. The same goes for corporate bonds as well. Most of these investors are hold-to-maturity types who do not face volatility in the value of their holdings and consequently have no need for a hedging product. Secondly, there is perhaps a lack of diversity of view among the market participants. The market structure does not change quickly and it may not be optimal to impose accounting hegemony on banks and financial institutions to force them towards hedging in the interest of developing the market. The

strategy for development of the market, therefore, has to comprise widening the range of products, granting flexibility in product design to the exchanges, removing barriers for participation, etc. The Reserve Bank is now considering introduction of bond futures in other maturities in consultation with the SEBI.

Credit Derivatives

28. The Indian financial system has traditionally been bank based system where the external financial requirements of firms have been mostly met by banks. In the pre-liberalisation era, there were specialised term lending institutions which used cater to the long term capital requirement. This is no longer the case now. The need for a vibrant and liquid corporate bond market is based on several considerations. First, it will cater to the long term funds requirement of the corporate sector and help the banks manage their asset liability mismatch more effectively. Second, in a growing economy and with complex financial needs of existing and new firms, the corporate debt market provides a better, more cost effective access to funds. Among the steps taken to bring liquidity into the market is introduction of credit derivatives which help bond holders to insure themselves against risk of default. Having been introduced in the aftermath of the GFC, the product has been launched perhaps with a high dose of safety measures as some analysts suggest and this could perhaps accounts for its limited liquidity. There is a need to re-visit the issues hindering development of the CDS market, such as, non-availability of netting benefit of marked to market (MTM) leading to higher capital charges for the market players, dominance of high rated bonds not warranting any need for credit risk protection, procedural issues for some of the foreign banks being reluctant to execute Credit Support Annexes (CSA), large players like insurance companies not being able to sell protection, etc. The Reserve Bank is examining some of the prudential conditions that can be relaxed without compromising systemic stability.

Financial Market Infrastructure

29. As I mentioned earlier, the considered view of the GFC is that it is not so much the derivative products that are to be blamed but the infrastructure for trading and the risk management and regulations of the institutions. The corrective steps to prevent the recurrence of such a crisis have focussed a great deal on improving the transparency and risk management in the market infrastructure. Let me quote from the Pittsburgh Declaration of G-20 leaders summit. It stated, *“All standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest. OTC derivative contracts should be reported to trade repositories. Non-centrally cleared contracts should be subject to higher capital requirements. We ask the FSB and its relevant members to assess regularly implementation and whether it is sufficient to improve transparency in the derivatives markets, mitigate systemic risk, and protect against market abuse.”* Keeping in view the thrust of the G20 on reforms in the OTC derivatives market, Reserve Bank has drawn up and is implementing a roadmap focussed on standardisation (e.g., OIS has been standardised) reporting to the Trade Repositories {e.g., all foreign exchange and interest rate derivatives are reported to the Clearing Corporation of India Limited (CCIL)}, central clearing (e.g., 90 per cent of the IRS currently are being cleared through the Central Counter Party, i.e.,

the CCIL) & exchange or electronic platform based trading (e.g., permission to CCIL to start electronic trading platform for the IRS).

30. The need for robust market infrastructure has been recognised in India quite early. Settlement of financial contracts through a central counterparty (CCP) mechanism is a key risk-mitigation measure. We had introduced CCP clearing in government debt and foreign exchange spot transactions by a specialised institution (viz. CCIL) in 2001 and 2006 respectively. CCIL has also been permitted to act as CCP for interest rate swaps and the service is expected to be launched shortly. Mandated central clearing of forward foreign exchange transactions has also been put in place.

31. The important role of a trade repository for OTC derivative transactions has been recognised for dealing with opacity inherent in OTC transactions. It must be recognised that even before the GFC brought to the fore the importance of trade repositories, we had enabled CCIL to collect and store transaction level data in respect of rupee interest rate swap reported to it through a regulatory mandate. The scope of the repositories has since been expanded to include the entire spectrum of OTC derivative products which is assisting regulatory surveillance and supervision.

32. Much as the exchange traded segment may provide safety and transparency, the role of the OTC market cannot be overlooked. The main advantage comes from the bespoke nature of the market. In modern finance, the funding requirement, cash flows and risk appetite vary from company to company and from financial institution to financial institution. An exchange-traded product is necessarily standardised and disincentivises financial innovation. Completely moving away from OTC products is like throwing the baby with the bathwater. Of course, the need to improve the market infrastructure and regulatory framework for the financial institutions' trading and taking position in OTC products needs to be strengthened. This is precisely what we have been doing for the OTC derivatives in forex and interest rate and credit derivatives.

33. In parallel drawing from the lessons of the recent GFC for effective risk management of the Financial Market Infrastructure (FMI), the existing structures have been strengthened and consolidated by the Committee on Payment & Settlement System (CPSS) {now Committee on Payments & Market Infrastructure (CPMI)} and the Technical Committee of the International Organization of Securities Commission (IOSCO) by way of 24 Principles for the FMIs (PFMIs). Some of the principles which have assumed more importance involve general business risk in terms of recovery and resolution of the FMI, settlement finality, operational risk, tiered arrangements and disclosure of market data by the TR besides the requirement of the central bank and other regulators to exercise effective oversight over the FMIs in relation to these principles. Reserve Bank of India and the security market regulator, SEBI, are committed to fulfil their responsibilities and ensure compliance with the PFMIs by the CCPs. For example, CCIL is being regularly evaluated for its level of compliance and our assessments indicate that there is a very high degree of convergence with these principles. Of course, continuous evaluation against existing and evolving standards will remain a priority for us. Currently, we are in advance stage of dialogue with European Market Infrastructure Regulators (EMIR), the ESMA & the US authorities like the Commodity Futures Trading Commission (CFTC), for recognition of our FMIs like the CCIL of following standards equivalent to those prescribed by them for

settlement of securities, forex & derivatives so that market participants from these countries/region can participate in our markets without impacting their trading activities & raising transaction costs, thereby affecting market volumes & liquidity.

Conclusion

34. Let me now conclude based on what emerged from the above discussion.
 - a. The importance of financial sector in lubricating a modern economy cannot be overemphasized.
 - b. Financial transactions are subject to information problems and hence prone to market failure. This motivates the need for regulation and the regulations have to such as to address possibility of market failure but at the same time not discourage growth of the sector nor stifle responsible innovation.
 - c. Derivatives contribute to efficient working of the financial system and management of risk. This is also necessary for socially useful but risky projects to be ventured. But at the same time, if their risk implication is not understood, they can cause and aggravate market failures.
 - d. Modern financial markets including markets for derivatives in India are a little more than two decades old. They are still evolving. It is wise to learn from other's mistakes and adopt a cautious and gradual approach, recognising at the same time that one cannot cross a chasm in two leaps.
