

Comprehensive guidelines on derivatives

1. Definition of a Derivative

A derivative¹ is a financial instrument:

(a) whose value changes in response to the change in a specified interest rate, security price, commodity price, foreign exchange rate, index of prices or rates, a credit rating or credit index, or similar variable (sometimes called the 'underlying');

(b) that requires no initial net investment or little initial net investment relative to other types of contracts that have a similar response to changes in market conditions; and

(c) that is settled at a future date.

1.1 In India, different derivatives instruments are permitted and regulated by various regulators, like Reserve Bank of India (RBI), Securities and Exchange Board of India (SEBI) and Forward Markets Commission (FMC). Broadly, RBI is empowered to regulate the interest rate derivatives, foreign currency derivatives and credit derivatives. For regulatory purposes, derivatives have been defined in the Reserve Bank of India Act, as follows:

“derivative”² means an instrument, to be settled at a future date, whose value is derived from change in interest rate, foreign exchange rate, credit rating or credit index, price of securities (also called “underlying”), or a combination of more than one of them and includes interest rate swaps, forward rate agreements, foreign currency swaps, foreign currency-rupee swaps, foreign currency options, foreign currency-rupee options or such other instruments as may be specified by the Bank from time to time.

¹ As defined in International Accounting Standard (IAS) 39.

² As defined in section 45U of RBI (Amendment) Act 2006.

2. Derivatives Markets

There are two distinct groups of derivative contracts:

- Over-the-counter (OTC) derivatives: Contracts that are traded directly between two eligible parties, with or without the use of an intermediary and without going through an exchange.
- Exchange-traded derivatives: Derivative products that are traded on an exchange.

3. Participants

Derivatives serve a useful risk-management purpose for both financial and non-financial firms. It enables transfer of various financial risks to entities who are more willing or better suited to take or manage them. Participants of this market can broadly be classified into two functional categories³, namely, market-makers and users.

1. **User:** A **user** participates in the derivatives market to manage an underlying risk.
2. **Market-maker:** A **market-maker** provides bid and offer prices to users and other market-makers. A market-maker need not have an underlying risk.

At least one party to a derivative transaction is required to be a market-maker.

4. Purpose

Users can undertake derivative transactions to hedge - specifically reduce or extinguish an existing identified risk on an ongoing basis during the life of the derivative transaction - or for transformation of risk exposure, as specifically permitted by RBI. Users can also undertake hedging of a homogeneous group of assets & liabilities, provided the assets & liabilities are individually permitted to be hedged.

Market-makers can undertake derivative transactions to act as counterparties in derivative transactions with users and also amongst themselves.

³ This is a purely functional definition. For example, a market making entity, if he is undertaking a derivative transaction to manage an underlying risk, would be acting in the role of a user.

5. Eligibility criteria:

(i) Market-makers:

- All Commercial Banks (excluding LABs & RRBs) & Primary Dealers* (PDs).

Banks and PDs should develop sufficient understanding and expertise about derivative products both in terms of staff and systems in order to undertake derivative business as market makers.

(ii) Users:

- Business entities with identified underlying risk exposure.

6. Broad principles for undertaking derivative transactions

The major requirements for undertaking any derivative transaction from the regulatory perspective would include:

- Market-makers may undertake a transaction in any derivative structured product (a combination of permitted cash and generic derivative instruments) as long as it is a combination of two or more of the generic instruments permitted by RBI and does not contain any derivatives as underlying;
- Market-makers should be in a position to arrive at the fair value of all derivative instruments, including structured products on the basis of the following approach :
 - (a) Marking the product to market, if a liquid market in the product exists.
 - (b) In the case of structured products, marking the constituent generic instruments to market.
 - (c) If (a) and (b) are not feasible, marking the product to model, provided:
 - All the model inputs are observable market variables.
 - Full particulars of the model, including the quantitative algorithm should be documented.

It may be ensured that structured products do not contain any derivative, which is not allowed on a stand alone basis.

* All references to Primary Dealers in these guidelines apply to stand-alone PDs, not Bank-PDs.

- All permitted derivative transactions, including roll over, restructuring and novation shall be contracted only at prevailing market rates.
- All risks arising from derivatives exposures should be analysed and documented, both at transaction level and portfolio level.
- The management of derivatives activities should be an integral part of the overall risk management policy and mechanism. It is desirable that the board of directors and senior management understand the risks inherent in the derivatives activities being undertaken.
- Market-makers should have a 'Suitability and Appropriateness Policy' vis-à-vis users in respect of the products offered, on the lines indicated in these guidelines.
- Market-makers may, where they consider necessary, maintain cash margin/liquid collateral in respect of derivative transactions undertaken by users on mark-to-market basis.

7. Permissible derivative instruments

At present, the following types of derivative instruments are permitted, subject to certain conditions:

- **Rupee interest rate derivatives** – Interest Rate Swap (IRS), Forward Rate Agreement (FRA), and Interest Rate Futures (IRF).
- **Foreign Currency derivatives** – Foreign Currency Forward, Currency Swap and Currency Option – (Separate guidelines regarding Foreign Currency derivatives are being issued).

Definitions of these generic derivatives are provided in the **Appendix A**.

7.1. Rupee Interest Rate Derivatives

(a) Product Market:

- (i) **Over the Counter (OTC)** – Forward Rate Agreements & Interest Rate Swaps
- (ii) **Exchange Traded** – Interest Rate Futures

(b) Products:

- (i) **Forward Rate Agreement (FRA)**
- (ii) **Interest Rate Swap (IRS)**

Eligible entities can undertake different types of plain vanilla FRAs/ IRS. Swaps having explicit/ implicit option features such as caps/ floors/ collars are not permitted.

(iii) Interest Rate Futures (IRF)

(c) Benchmark Rate/s for FRA/ IRS

Any domestic money or debt market rupee interest rate; or, rupee interest rate implied in the forward foreign exchange rates, as permitted by RBI in respect of MIFOR swaps.(cf paragraph 3 of DBOD Circular No. DBOD.BP.BC. 53/ 21.04.157/ 2005-06 dated December 28, 2005)

(d) Participants

Users

All business entities, including banks and Primary Dealers.

Market-makers

- (i) **For Forward Rate Agreement / Interest Rate Swap** - All Commercial Banks (excluding LABs & Regional Rural Banks) and Primary Dealers.
- (ii) **For Interest Rate Futures** – Primary Dealers.

(e) Purpose:

Users

- (i) For hedging (as defined in paragraph 4 above) underlying exposures
 - (a) Banks, PDs and AFIs can undertake FRA/ IRS to hedge the interest rate risk on any item(s) of asset or liability on their balance sheet.
 - (b) Banks may undertake interest rate futures transactions to hedge the interest rate risk on their investments in Government securities in AFS and HFT portfolios.
- (ii) PDs may hold trading position in IRF, subject to internal guidelines in this regard.

8. Risk management and corporate governance aspects

This section sets out the basic principles of a prudent system to control the risks in derivatives activities. These include:

- a) appropriate oversight by the board of directors and senior management;
- b) adequate risk management process that integrates prudent risk limits, sound measurement procedures and information systems, continuous risk monitoring and frequent management reporting; and
- c) comprehensive internal controls and audit procedures.

8.1 Corporate governance

- a) It is vital, while dealing with potentially complex products, such as derivatives that the board and senior management should understand the nature of the business which the bank is undertaking. This includes an understanding of the nature of the relationship between risk and reward, in particular an appreciation that it is inherently implausible that an apparently low risk business can generate high rewards.
- b) The board of directors and senior management also need to demonstrate through their actions that they have a strong commitment to an effective control environment throughout the organization.
- c) The board and senior management, in addition to advocating prudent risk management, should encourage more stable and durable return performance and discourage high, but volatile returns.
- d) The board of directors and senior management should ensure that the organization of the bank is conducive to managing risk. It is necessary to ensure that clear lines of responsibility and accountability are established for all business activities, including derivative activities.
- e) The central risk control function at the head office should also ensure that there is sufficient awareness of the risks and the size of exposure of the trading activities in derivatives operations.

The compliance risks in all new products and processes should be thoroughly analysed and appropriate risk mitigants by way of necessary checks and balances should be put in place before the launching of new products. The Chief Compliance Officer must be involved in the mechanism for approval of new products and all such products should be signed off by

him. The Compliance Officer should also review and sign off all the existing products in light of these guidelines.

8.2 Board and senior management oversight

Consistent with its general responsibility for corporate governance, the board should approve written policies which define the overall framework within which derivatives activities should be conducted and the risks controlled. The management of derivative activities should be integrated into the bank's overall risk management system using a conceptual framework common to the bank's other activities.

The policy framework for derivatives approved by the board may be general in nature. But the framework should cover the following aspects:

- a) establish the institution's overall appetite for taking risk and ensure that it is consistent with its strategic objectives, capital strength and management capability to hedge or transfer risk effectively, efficiently and expeditiously.
- b) define the approved derivatives products and the authorized derivatives activities.
- c) detail requirements for the evaluation and approval of new products or activities.
- d) provide for sufficient staff resources and other resources to enable the approved derivatives activities to be conducted in a prudent manner;
- e) ensure appropriate structure and staffing for the key risk control functions, including internal audit;
- f) establish management responsibilities;
- g) identify the various types of risk faced by the bank and establish a clear and comprehensive set of limits to control these;
- h) establish risk measurement methodologies which are consistent with the nature and scale of the derivatives activities;
- i) require stress testing of risk positions ; and

- j) detail the type and frequency of reports which are to be made to the board (or committees of the board).

The type of reports to be received by the board should include those which indicate the levels of risk being undertaken by the institution, the degree of compliance with policies, procedures and limits, and the financial performance of the various derivatives and trading activities. Internal and external audit reports should be reviewed by a board-level audit committee and significant issues of concern should be drawn to the attention of the board.

8.3 Suitability and Appropriateness Policy

The rapid growth of the derivatives market, especially structured derivatives has increased the focus on 'suitability' and 'appropriateness' of derivative products being offered by market-makers to customers (users) as also customer appropriateness. Market-makers should undertake derivative transactions, particularly with users with a sense of responsibility and circumspection that would avoid, among other things, misselling. It is an imperative that market-makers offer derivative products in general, and structured products, in particular, only to those users who understand the nature of the risks inherent in these transactions and further that products being offered are consistent with users' business, financial operations, skill & sophistication, internal policies as well as risk appetite. Inadequate understanding of the risks and future obligations under the contracts by the users, in the initial stage, may lead to potential disputes and thus cause damage to the reputation of market-makers. The market-makers may also be exposed to credit risk if the counterparty fails to meet his financial obligations under the contract.

The market-makers should carry out proper due diligence regarding 'user appropriateness' and 'suitability' of products before offering derivative products to users. Each market-maker should adopt a board-approved 'Customer Appropriateness & Suitability Policy' for derivatives business.

The objective of the policy is prudential in nature: to protect the market-maker against the credit, reputation and litigation risks that may arise from a user's

inadequate understanding of the nature and risks of the derivatives transaction. In general, market-makers should not undertake derivative transactions with or sell structured products to users that do not have properly documented risk management policies that include, among other things, risk limits for various risk exposures. Furthermore, structured products should be sold only to those users which follow prudent accounting and disclosure norms and are capable of ascertaining the mark to market position of these products on an on-going basis. While selling structured products the selling banks should make available a calculator or at least access to a calculator (say on the market maker's website) which will enable the users to mark to market these structured products on an ongoing basis.

While undertaking derivative transactions with or selling structured derivative products to a user, a market-maker should:

- a) document how the pricing has been done and how periodic valuations will be done. In the case of structured products, this document should contain a dissection of the product into its generic components to demonstrate its permissibility, on the one hand, and to explain its price and periodic valuation principles, on the other. The following information may be shared with the user:
 - (i) Description of the transaction
 - (ii) Building blocs of the transaction
 - (iii) Rationale along with appropriate risk disclosures
 - (iv) Sensitivity analysis identifying the various market parameters that affect the product.
 - (v) Scenario Analysis encompassing both the possible upside as well as the downsides
- b) analyse the expected impact of the proposed derivatives transaction on the user;
- c) ascertain whether a users has the appropriate authority to enter into derivative transactions and whether there are any limitations on the use of specific types of derivatives in terms of the former's board memorandum/policy, level at which derivative transactions are approved, the involvement of senior management in decision-making and monitoring derivatives activity undertaken by it,

- d) identify whether the proposed transaction is consistent with the user's policies and procedures with respect to derivatives transactions, as they are known to the market-maker,
- e) ensure that the terms of the contract are clear and assess whether the user is capable of understanding the terms of the contract and of fulfilling its obligations under the contract,
- f) inform the customer of its opinion, where the market-maker considers that a proposed derivatives transaction is inappropriate for a customer. If the customer nonetheless wishes to proceed, the market-maker should document its analysis and its discussions with the customer in its files to lessen the chances of litigation in case the transaction proves unprofitable to the customer. The approval for such transactions should be escalated to next higher level of authority at the market-maker as also for the user,
- g) ensure the terms of the contract are properly documented, disclosing the inherent risks in the proposed transaction to the customer in the form of a Risk Disclosure Statement which should include a detailed scenario analysis (both positive and negative) and payouts **in quantitative terms** under different combination of underlying market variables such as interest rates and currency rates, etc., assumptions made for the scenario analysis and obtaining a written acknowledgement from the counterparty for having read and understood the Risk Disclosure Statement.
- h) guard against the possibility of misunderstandings all significant communications between the market-maker and user should be in writing or recorded in meeting notes.
- i) ensure to undertake transactions at prevailing market rates and to avoid transactions that could result in acceleration/deferment of gains or losses,
- j) should establish internal procedures for handling customer disputes and complaints. They should be investigated thoroughly and handled fairly and promptly. Senior management and the Compliance Department/Officer should be informed of all customer disputes and complaints at a regular interval.

It may also be noted that the responsibility of 'Customer Appropriateness and Suitability' review is on the market-maker.

8.4 Documentation

Market participants are advised to ensure that the documentation requirements in respect of derivative contracts are complete in all respects. Illustratively:

- (i) For the sake of uniformity and standardization in respect of all derivative contracts, participants may use ISDA documentation, with suitable modifications for continuing ongoing relationships. Counterparties are free to modify the ISDA Master Agreement by inserting suitable clauses in the schedule to the ISDA Master Agreement to reflect the terms that the counterparties may agree to, including the manner of settlement of transactions and choice of governing law of the Agreement. In case of 'one off' transactions, appropriate documentation may be used.
- (ii) It may be mentioned that besides the ISDA Master Agreement, participants should obtain specific confirmation for each transaction which should detail the terms of the contract such as gross amount, rate, value date, etc..
- (iii) It is also preferable to make a mention of the Master Agreement in the individual transaction confirmation.
- (iv) Participants should further evaluate whether the counterparty has the legal capacity, power and authority to enter into derivative transactions.
- (v) Participants shall obtain documentation regarding customer suitability, appropriateness etc. as specified .

8.5 The identification of risk

Market-makers should identify the various types of risk to which they are exposed in their derivatives activities. The main types of risk are:

- . credit risk
- . market risk
- . liquidity risk
- . operational risk
- . legal risk

The risks generally associated with derivatives are enunciated in **Appendix B**.

8.6 Risk measurement

Accurate measurement of derivative-related risks is necessary for proper monitoring and control. All significant risks should be measured and integrated into a entity-wide risk management system.

The risk of loss can be most directly quantified in relation to *market risk* and *credit risk* (though other risks may have an equally or even greater adverse impact on earnings or capital if not properly controlled). These two types of risks are clearly related since the extent to which a derivatives contract is "in the money" as a result of market price movements will determine the degree of credit risk. This illustrates the need for an integrated approach to the risk management of derivatives. The methods used to measure market and credit risk should be related to:

- a) the nature, scale and complexity of the derivatives operation;
- b) the capability of the data collection systems; and
- c) the ability of management to understand the nature, limitations and meaning of the results produced by the measurement system.

Mark-to-market

The measurement process starts with marking to market of risk positions. This is necessary to establish the *current* value of risk positions and to recognize profits and losses in the books of account. It is essential that the revaluation process is carried out by an independent risk control unit or by back office staff who are independent of the risk-takers in the front office, and that the pricing factors used for revaluation are obtained from a source which is independently verifiable.

Measuring market risk

The risk measurement system should assess the probability of *future* loss in derivative positions. In order to achieve this objective, it is necessary to estimate:

- a) the sensitivity of the instruments in the portfolio to changes in the market factors which affect their value (e.g. interest rates, exchange rates and volatilities); and
- b) the tendency of the relevant market factors to change based on past volatilities and correlations.

The assumptions and variables used in the risk management method should be fully documented and reviewed regularly by the senior management, the independent risk management unit and internal audit.

Stress tests

Regardless of the measurement system and assumptions used to calculate risk on a day-to-day basis, entities should conduct regular stress tests to evaluate the exposure under worst-case market scenarios (i.e. those which are *possible* but not *probable*). Stress tests need to cover a range of factors that could either generate extraordinary losses or make the control of risk very difficult. Stress scenarios may take into account such factors as the largest historical losses actually suffered by the entity and evaluation of the current portfolio on the basis of extreme assumptions about movements in interest rates or other market factors or in market liquidity. The results of the stress testing should be reviewed regularly by senior management and should be reflected in the policies and limits which are approved by the board of directors and senior management.

Options

The measurement of the market risk in options involves special considerations because of their non-linear price characteristics. This means that the price of an option does not necessarily move in a proportionate relationship with that of the underlying instrument, principally because of gamma and volatility risk. Measurement of risk exposure of an options portfolio may therefore require the use of simulation techniques to calculate, for example, changes in the value of the options portfolio for various combinations of changes in the prices of the underlying instruments and changes in volatility. The risk exposure would be calculated from that combination of price and volatility change that produced the largest loss in the portfolio. Other more elaborate simulation techniques may be used.

Measuring credit risk

The credit risks of derivatives products have two components: pre-settlement risk and settlement risk. They should be monitored and managed separately.

Pre-settlement risk is the risk of loss due to a counterparty defaulting on a contract during the life of a transaction.

Settlement risk arises where securities or cash are exchanged and the loss can amount to the full value of the amounts to be exchanged. In general, the time-frame for this risk is quite short and arises only where there is no delivery against payment.

8.7 Risk Limits

Risk limits serve as a means to control exposures to the various risks associated with derivative activities. Limits should be integrated across all activities and measured against aggregate (e.g., individual and geographical) risks. Limits should be compatible with the nature of the entity's strategies, risk measurement systems, and the board's risk tolerance. To ensure consistency between limits and business strategies, the board should annually approve

limits as part of the overall budget process. The system of limits should include procedures for the reporting and approval of exceptions to limits. It is essential that limits should be rigorously enforced and that significant and persistent breaches of limits should be reported to senior management and fully investigated.

Market risk limits

Market risk limits should be established at different levels of the entity, i.e. the entity as a whole, the various risk-taking units, trading desk heads and individual traders. It may also be appropriate to supplement these with limits for particular products. In determining how market risk limits are established and allocated, management should take into account factors such as the following:

- a) past performance of the trading unit;
- b) experience and expertise of the traders;
- c) level of sophistication of the pricing, valuation and measurement systems;
- d) the quality of internal controls;
- e) the projected level of trading activity having regard to the liquidity of particular products and markets; and
- f) the ability of the operations systems to settle the resultant trades.

Some commonly used market risk limits are: notional or volume limits, stop loss limits, gap or maturity limits, options limits and value-at-risk limits. These are described in **Appendix C**. The selection of limits should have regard to the nature, size and complexity of the derivatives operation, market volatility and to the type of risk measurement system. In general, the overall amount of market risk being run by the entity is best controlled by value-at risk limits. These provide senior management with an easily understood way of monitoring and controlling the amount of capital and earnings which the entity is putting at risk through its trading activities.

Stop loss limits may be useful for triggering specific management action (e.g. to close out the position) when a certain level of unrealized losses are reached. They do not however control the potential size of loss which is inherent in the position or portfolio (i.e. the Value at Risk) and which may be greater than the stop loss limit. They will thus not necessarily prevent losses if the position cannot be exited (e.g. because of market illiquidity).

It may be appropriate to set limits on particular products or maturities (as well as on portfolios) in order to reduce market and liquidity risk which would arise from concentrations in these. Similarly, risks associated with options can be controlled by concentration limits based on strike price and expiration date. This reduces the potential impact on earnings and cash flow of a large amount of options being exercised at the same time.

Credit limits

Banks should establish both pre-settlement credit limits and settlement credit limits. The former should be based on the credit-worthiness of the counterparty in much the same way as for traditional credit lines. The size of the limits should take into account the sophistication of the risk measurement system: if notional amounts are used (which is *not* recommended), the limits should be correspondingly more conservative.

It is important that entities should establish separate limits for settlement risk. The amount of exposure due to settlement risk often exceeds the credit exposure arising from pre-settlement risk because settlement of derivatives transactions may involve the exchange of the total value of the instrument or principal cash flow. Settlement limits should have regard to the efficiency and reliability of the relevant settlement systems, the period for which the exposure will be outstanding, the credit quality of the counterparty and the entity's own capital adequacy.

Entities should have efficient systems in place to aggregate its exposure to a counterparty across fund based and non fund based exposures, including

derivatives. These aggregate exposures should be within the single counterparty exposure limits set by the management or regulator, whichever is less.

Liquidity limits

The *cash flow/funding liquidity risk* in derivatives can be dealt with by incorporating derivatives into the entity's overall liquidity policy and, in particular, by including derivatives within the structure of the maturity mismatch limits. A particular issue is the extent to which entities take account of the right which may have been granted to counterparties to terminate a derivatives contract under certain specified circumstances, thus triggering an unexpected need for funds.

It is necessary for entities to take into account the funding requirements which may arise because of the need to make margin payments in respect of exchange-traded derivatives. The entity should have the ability to distinguish between margin calls which are being made on behalf of clients (and monitor the resultant credit risk on the user-clients) and those which arise from proprietary trades.

As noted earlier, the *market* or *product* liquidity risk that arises from the possibility that the entity will not be able to exit derivatives positions at a reasonable cost, can be mitigated by setting limits on concentrations in particular markets, exchanges, products and maturities.

8.8 Management Information Systems

The frequency and composition of board and management reporting should depend upon the nature and significance of derivative activities. Where applicable, board and management reports should consolidate information across functional and geographic divisions. Board and management reporting should be tailored to the intended audience, providing summary information to senior management and the board and more detailed information to line management.

8.9 Independent risk control

There should be a mechanism within each entity for independently monitoring and controlling the various risks in derivatives. The inter-relationship between the different types of risks needs to be taken into account.

Entities which are **market-makers** in derivatives should maintain a unit which is responsible for monitoring and controlling the risks in derivatives. This unit should report directly to the board (or ALCO) or to senior management who are not directly responsible for trading activities. Where the size of the entity or its involvement in derivatives activities does not justify a separate unit dedicated to derivative activities, the function may be carried out by support personnel in the back office (or in a "middle office") provided that such personnel have the necessary independence, expertise, resources and support from senior management to do the job effectively.

Whatever form the risk control function takes, it is essential that it is distanced from the control and influence of the trading function.

The minimum risk control functions which should be performed include the following:

- a) the monitoring of market risk exposures against limits and the reporting of exceptions to middle office;
- b) the marking-to-market of risk exposures and reconciliation of risk positions and profit/loss between the front and back offices;
- c) the preparation of management reports, including daily profit/loss results and gross and net risk positions; and
- d) the monitoring of credit exposures to individual counterparties against limits and the reporting of exceptions to middle office.

The risk management system and the effectiveness and independence of the risk control unit should themselves be subject to regular review by internal audit.

8.10 Operational controls

Operational risk arises as a result of inadequate internal controls, human error or management failure. This risk in derivatives activities is particularly important, because of the complexity and rapidly evolving nature of some of the products. The nature of the controls in place to manage operational risk must be commensurate with the scale and complexity of the derivatives activity being undertaken. As noted earlier, volume limits may be used to ensure that the number of transactions being undertaken does not outstrip the capacity of the support systems to handle them.

Segregation of duties

Segregation of duties is necessary to prevent unauthorized and fraudulent practices. This has a number of detailed aspects but the fundamental principle is that there should be clear separation, both functionally and physically, between the front office which is responsible for the conduct of trading operations and the back office which is responsible for processing the resultant trades.

A basic and essential safeguard against abuse of trust by an individual is to insist that all staff should take a minimum continuous period of annual leave (say 2 weeks) each year. This makes it more difficult to conceal frauds in the absence of the individual concerned.

Policies and procedures

Policies and procedures should be established and documented to cover the internal controls which apply at various stages in the work flow of processing and monitoring trades. Apart from segregation of duties, these include:

- trade entry and transaction documentation
- confirmation of trades
- settlement and disbursement
- reconciliations
- revaluation
- exception reports

- accounting treatment
- audit trail

A checklist of some of the key controls under these headings is given in **Appendix D**.

Contingency plan

Plans should be in place to provide contingency systems and operations support in the case of a natural disaster or systems failure. These should include emergency back-up for dealing functions as well as critical support functions. Contingency plans should be reviewed and tested on a regular basis.

9. Internal audit

Internal audit is an important part of the internal control process. Audit should be conducted by qualified professionals, who are independent of the business line being audited. Audit should be supplementary and not be a substitute for risk control function. The scope of audit coverage should be commensurate with the level of risk and volume of activity.

Internal audit function should:

- a) review the adequacy and effectiveness of the overall risk management system, including compliance with policies, procedures and limits;
- b) review the adequacy and test the effectiveness of the various operational controls (including segregation of duties) and staff's compliance with the established policies and procedures;
- c) investigate unusual occurrences such as significant breaches of limits, unauthorized trades and unreconciled valuation or accounting differences;
- d) evaluate the reliability and timeliness of information reported to senior management and the board of directors;
- e) trace and verify information provided on risk exposure reports to the underlying data sources;
- f) be an appraisal of the effectiveness and independence of the risk management process;

- g) ensure that risk measurement models, including algorithms, are properly validated; and
- h) include an evaluation of the adequacy of the derivative valuation process and ensure that it is performed by parties independent of risk-taking activities. Auditors should test derivative valuation reports for accuracy. For hedge transactions, auditors should review the appropriateness of accounting.
- i) evaluate the risk disclosure statements issued to customers in terms of adherence to Customer Suitability and Appropriateness Policy

In preparing internal audit reports, major control weaknesses should be highlighted and a management action plan to remedy the weaknesses should be agreed with a timetable. Management should respond promptly to audit findings by investigating identified system and internal control weaknesses and implementing corrective action. Thereafter, management should periodically monitor newly implemented systems and controls to ensure they are working appropriately. Failure of management to implement recommendations within an agreed timeframe should be reported to the Audit Committee.

10. Prudential norms relating to derivatives

The prudential norms relating to derivatives – minimum capital adequacy requirement, credit exposure norms, ALM etc. will be as prescribed by RBI from time to time.

11. Prudential limits on derivatives

The gross PV 01 of all non-option rupee derivative contracts (including rupee – foreign currency contracts) should be within 0.25 per cent of the net worth of the bank as on the last balance sheet date. The gross PV01 may be determined by aggregating net PV01 of different benchmarks, ignoring the signs. The limit would also exclude the PV 01 of derivatives which are hedges for balance sheet items, provided these hedges meet the criteria of hedge effectiveness as laid down in our circular IDMC.MSRD.4801 /06.01.03/2002-03 dated June 3, 2003.

12. Regulatory reporting, balance sheet disclosures, valuation and Accounting

The current regulatory reporting and balance sheet disclosures as prescribed from time to time by RBI may continue for present. The extant guidelines on valuation and accounting would also continue to be in place till revised guidelines in this regard are finalised. The reporting requirement in alignment with the revised accounting guidelines would be communicated later.

Product Definitions

Forward Rate Agreement (FRA)

A Forward Rate Agreement is a financial contract between two parties to exchange interest payments for a 'notional principal' amount on settlement date, for a specified period from start date to maturity date. Accordingly, on the settlement date, cash payments based on contract (fixed) and the settlement rate, are made by the parties to one another. The settlement rate is the agreed bench-mark/ reference rate prevailing on the settlement date.

Interest Rate Swap (IRS)

An Interest Rate Swap is a financial contract between two parties exchanging or swapping a stream of interest payments for a 'notional principal' amount on multiple occasions during a specified period. Such contracts generally involve exchange of a 'fixed to floating' or 'floating to floating' rates of interest. Accordingly, on each payment date - that occurs during the swap period - cash payments based on fixed/ floating and floating rates, are made by the parties to one another.

Interest Rate Futures (IRF)

Interest Rate Future is a standardized, exchange-traded contract with an actual or notional interest-bearing instrument(s) as the underlying asset.

Foreign Exchange Forward

A foreign exchange forward is an over-the-counter contract under which a purchaser agrees to buy from the seller, and the seller agrees to sell to the purchaser, a specified amount of a specified currency on a specified date in the future - beyond the spot settlement date - at a known price denominated in another currency (known as the forward price) that is specified at the time the contract is entered into.

Currency Swaps

A currency swap is an interest rate swap where the two legs to the swap are denominated in different currencies. Additionally the parties may agree to exchange the two currencies normally at the prevailing spot exchange rate with an agreement to reverse the exchange of currencies, at the same spot exchange rate, at a fixed date in the future, generally at the maturity of the swap.

Currency Options

A currency option is a contract where the purchaser of the option has the right but not the obligation to either purchase (call option) or sell (put option) and the seller (or writer) of the option agrees to sell (call option) or purchase (put option) an agreed amount of a specified currency at a price agreed in advance and denominated in another currency (known as the strike price) on a specified date (European option) or by an agreed date (American option) in the future.

Interest Rate Caps and Floors

An interest rate cap is an interest rate option in which payments are made when the reference rate exceeds the strike rate. Analogously, an interest rate floor is an interest rate option in which payments are made when the reference rate falls below the strike rate.

Types of derivatives risks

1. Credit risk

Credit risk is the risk of loss due to a counterparty's failure to perform on an obligation to the institution. Credit risk in derivative products comes in two forms:

Pre-settlement risk is the risk of loss due to a counterparty defaulting on a contract during the life of a transaction. The level of exposure varies throughout the life of the contract and the extent of losses will only be known at the time of default.

Settlement risk is the risk of loss due to the counterparty's failure to perform on its obligation after an institution has performed on its obligation under a contract on the settlement date. Settlement risk frequently arises in international transactions because of time zone differences. This risk is only present in transactions that do not involve delivery versus payment and generally exists for a very short time (less than 24 hours).

2. Market risk

Market risk is the risk of loss due to adverse changes in the market value (the price) of an instrument or portfolio of instruments. Such exposure occurs with respect to derivative instruments when changes occur in market factors such as underlying interest rates, exchange rates, equity prices, and commodity prices or in the volatility of these factors.

3. Liquidity risk

Liquidity risk is the risk of loss due to failure of an institution to meet its funding requirements or to execute a transaction at a reasonable price. Institutions involved in derivatives activity face two types of liquidity risk : market liquidity risk and funding liquidity risk.

Market liquidity risk is the risk that an institution may not be able to exit or offset positions quickly, and in sufficient quantities, at a reasonable price. This inability may be due to inadequate market depth in certain products (e.g. exotic derivatives, long-dated options), market disruption, or inability of the bank to access the market (e.g. credit down-grading of the institution or of a major counterparty).

Funding liquidity risk is the potential inability of the institution to meet funding requirements, because of cash flow mismatches, at a reasonable cost. Such funding requirements may arise from cash flow mismatches in swap books, exercise of options, and the implementation of dynamic hedging strategies.

4. Operational risk

Operational risk is the risk of loss occurring as a result of inadequate systems and control, deficiencies in information systems, human error, or management failure. Derivatives activities can pose challenging operational risk issues because of the complexity of certain products and their continual evolution.

5. Legal risk

Legal risk is the risk of loss arising from contracts which are not legally enforceable (e.g. the counterparty does not have the power or authority to enter into a particular type of derivatives transaction) or documented correctly.

6. Regulatory risk

Regulatory risk is the risk of loss arising from failure to comply with regulatory or legal requirements.

7. Reputation risk

Reputation risk is the risk of loss arising from adverse public opinion and damage to reputation.

Commonly used market risk limits

1. Notional or volume limits

Limits based on the notional amount of derivatives contracts are the most basic and simplest form of limits for controlling the risks of derivatives transactions. They are useful in limiting transaction volume, and liquidity and settlement risks. However, these limits cannot take account of price sensitivity and volatility and say nothing about the actual level of risk (in capital or earnings terms) faced by the institution. Derivatives participants should not therefore use these limits as a stand-alone tool to control market risk.

2. Stop loss limits

These limits are established to avoid unrealized loss in a position from exceeding a specified level. When these limits are reached, the position will either be liquidated or hedged. Typical stop loss limits include those relating to accumulated unrealized losses for a day, a week or a month.

Some institutions also establish management action trigger (MAT) limits in addition to stop loss limits. These are for early warning purposes. For example, management may establish a MAT limit at 75 percent of the stop loss limit. When the unrealized loss reaches 75 percent of the stop loss limit, management will be alerted of the position and may trigger certain management actions, such as close monitoring of the position, reducing or early closing out the position before it reaches the stop loss limits.

The above loss triggers complement other limits, but they are generally not sufficient by themselves. They are not anticipatory; they are based on unrealized losses to date and do not measure the potential earnings at risk based on market characteristics. They will not prevent losses larger than the stop loss limits if it becomes impossible to close out positions, e.g. because of market illiquidity.

3. Gap or maturity band limits

These limits are designed to control loss exposure by controlling the volume or amount of the derivatives that mature or are repriced in a given time period. For example, management can establish gap limits for each maturity band of 3 months, 6 months, 9 months, one year, etc. to avoid maturities concentrating in certain maturity bands. Such limits can be used to reduce the volatility of derivatives revenue by staggering the maturity and/or repricing and thereby smoothing the effect of changes in market factors affecting price. Maturity limits can also be useful for liquidity risk control and the repricing limits can be used for interest rate management.

Similar to notional and stop loss limits, gap limits can be useful to supplement other limits, but are not sufficient to be used in isolation as they do not provide a reasonable proxy for the market risk exposure which a particular derivatives position may present to the institution.

4. Value-at-risk limits

These limits are designed to restrict the amount of potential loss from certain types of derivatives products or the whole trading book to levels (or percentages of capital or earnings) approved by the board and senior management. To monitor compliance with the limits, management calculates the current market value of positions and then uses statistical modeling techniques to assess the probable loss (within a certain level of confidence) given historical changes in market factors. There are three main approaches to calculating value-at-risk : the correlation method, also known as the variance/covariance matrix method; historical simulation and Monte Carlo simulation.

The advantage of value-at-risk (VAR) limits is that they are related directly to the amount of capital or earnings which are at risk. Among other things, they are therefore more readily understood by the board and senior management. The level of VAR limits should reflect the maximum exposures authorized by the board and senior management, the quality and sophistication of the risk measurement systems and the performance of the models used in assessing potential loss by comparing projected and actual results. One drawback in the use of such models is that they are only as good as the assumptions on which they are based (and the quality of the data which has been used to calculate the various volatilities, correlations and sensitivities).

5. Options limits

These are specifically designed to control the risks of options. Options limits may include Delta, Gamma, Vega, Theta and Rho limits.

Delta is a measure of the amount an options price would be expected to change for a unit change in the price of the underlying instrument.

Gamma is a measure of the amount delta would be expected to change in response to a unit change in the price of the underlying instrument.

Vega is a measure of the amount an option's price would be expected to change in response to a unit change in the price volatility of the underlying instrument.

Theta is a measure of the amount an option's price would be expected to change in response to changes in the options time to expiration.

Rho is a measure of the amount an option's price would be expected to change in response to changes in interest rates.

Recommendations on operational controls

A. Segregation of Duties

There should be clear segregation, functionally and physically, between the front office and back office.

There should be a middle office independent of the trading room and it should be responsible, *inter alia*, for undertaking various risk related monitoring, product approval, validation of valuation models used, stress testing, back testing of the risk limits etc. and also for regulatory reporting and compliance.

B. Trade Entry and Transaction Documentation

Management should ensure that procedures are in place to provide a clear and fully documented audit trail of derivatives transactions.

All derivatives transactions should be sequentially controlled to ensure that all deals are accounted for and to provide an audit trail for deals effected.

Every transaction should be updated (i.e. mark to market) in the calculation of market and credit risk limits.

- Deals should be transacted at market rates.

C. Confirmation Procedures

The method of confirmation used should provide a documentation trail that supports the institution's position in the event of disputes.

D. Settlement and Disbursement Procedures

Specific procedures should be established for the initiation of, and authority for, fund transfer.

Daily independent reconciliation of transferred funds with nostro accounts and general ledger is an essential control for detection of errors or misapplications of funds.

E. Reconciliation Procedures

All pertinent data, reports, and systems should be reconciled on a timely basis to ensure that the institutions official books agree with dealers records. At the minimum, the following reports should be reconciled:

Unusual items and any items outstanding for an inordinately long period of time should be investigated.

There should be adequate audit trail to ensure that balances and accounts have been properly reconciled. Reconciliation records and documentation should be maintained and independently reviewed. Such record should be kept for an appropriate period of time prior to their destruction.

F. Revaluation Procedures

The revaluation procedures should cover the full range of derivatives instruments included in the institutions trading portfolio.

Revaluation rates should be obtained from or verified by a source (or different sources in the case of OTC derivatives) independent of the dealers, representative of the market levels and properly approved. Revaluation calculations should be independently checked.

Revaluation rates and calculations should be fully documented.

G. Exceptions Reports

To track errors, frauds and losses, the back office should generate management reports that reflect current status and trends for the following items:

- Outstanding general ledger reconciling items.
- Failed trades.
- Off-market trades.
- After-hours and off-premises trading.
- Aging of unconfirmed trades.
- Suspense items payable/receivable.
- Brokerage payments.
- Miscellaneous losses.
- Limit breaches
- Details of deals resulting in exceptional profits and losses

The management information system/reporting system of the institution should enable the detection of unusual patterns of activity (i.e. increase in volume, new trading counterparties, etc.) for review by management.