

Auditing of Derivative Transactions and Treasury Operations in Banks



For the last two decades, market deregulation, increased global trade and technology have fundamentally changed the financial markets and as a result the increased market volatility has led to an increase in demand for risk-management products and growth of financial derivatives and increasing spectrum of over-the-counter products relating to risk management. The 2008 financial crisis, frauds in banks, suits filed by regulators, etc., have reminded the world about the importance of understanding risk factors and establishing risk management systems accordingly. In this article, the author provides an overview of bank's treasury operations while reflecting on the past and current market trends and regulatory activities. The article presents a perspective on key audit considerations from a bank auditor's point of view. Read on...

Market deregulation, growth in global trade, and continuing technological developments have revolutionised the financial marketplace during the last two decades. A by-product of this change is increased market volatility, which has led to a corresponding increase in demand for risk management products. This demand is reflected in the growth of financial derivatives from the standardised futures and options products to the wide spectrum of Over-The-Counter (OTC) products offered for risk management.

However, the 2008 financial crisis, frauds in banks, suits filed by regulators and allegations by corporates on miss-selling of derivative products by banks magnified the risks associated with derivatives. There have been several widely publicised reports on large derivative losses experienced by banks



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and corporates. Contributing to these losses were inadequate board and senior management oversight, excessive risk-taking, insufficient understanding of the products, and poor internal controls. These events serve as a reminder of the importance of understanding the various risk factors associated with business activities and establishing appropriate risk management systems to identify, measure, monitor, and control exposure.

Treasury Operations of Banks: An Overview

A treasury department is generally segregated into a three-tier structure, namely Front Office (FO), Middle Office (MO) and Back Office (BO). This structure is also ideal in terms of implementing best practice from a control environment stand point. The roles of each of these segments are summarised below:

FO - The dealing room responsibilities of a treasury department resides with the *Head of Treasury/ Chief Dealer*. Chief Dealer would have various dealers who would specialise in different treasury products and hence would individually be responsible for specific *desks* – which would each represent a product, *i.e.*, fixed income, money market, foreign exchange, derivatives, *etc.* Dealers will maintain their individual trading book. The Chief Dealer will fix the maximum size of the individual trading book of each dealer, within the overall stipulated trading book size.

MO – It is responsible for setting up control points and risk mitigating thresholds for transactions to be undertaken by FO. MO monitors the limits and tracks the performance of the portfolios. MO monitors various risks like liquidity risk, credit risk and market risk.

BO – BO is responsible for the trade payment and settlement functions. BO is responsible for meticulous compliance with regulatory requirements and responsible for timely submission of regulatory and other MIS reports. Some of the important functions of BO are:

- 1 Validating trades with supporting evidences – confirmations, conversation slips, *etc.*;

- 2 Reconciliations – intersystem, *nostr*o, position, intra-desk, custodian and others;
- 3 Trade settlement;
- 4 Accounting; and
- 5 MIS reports.

Derivatives Landscape

Financial derivatives are simply financial contracts in which the promised payoffs are derived from the value of the *underlying*, which is often an asset price (stock price) or rate (interest rate on treasury bills). Derivatives are either exchange-traded or OTC. Institutions and dealers trade futures, certain option, and other standardised contracts under uniform rules through an organised exchange. OTC derivatives are privately traded instruments (primarily swap, option, and forward contracts) customised to meet specific needs and for which the counterparty is not an organised exchange. As a result, although OTC derivatives are more flexible, they potentially involve higher credit and liquidity risk.

Use of Derivatives

Derivatives have become an integral part of the financial markets because they can serve several economic functions. Derivatives can be used to reduce business risks, expand product offerings to customers, trade for profit, manage capital and funding costs, and alter the risk-reward profile of a particular item or an entire balance sheet.

At a broader level, derivatives are used for the following two objectives:

- *Speculation*: Speculation involves the objective of profiting by entering into an exposed position.
- *Risk Management*: Most institutions that use derivatives do so to increase or decrease risks associated with existing or anticipated on- or off-balance-sheet transactions, not for speculation.

Derivative Market in India

In order to manage the currency risk, it was felt necessary to construct a menu of derivative products available to the end-users. Accordingly, the Reserve Bank of India (RBI) introduced a wide array of hedging instruments. The Reserve Bank of India Act, 1934 empowers RBI to regulate OTC products providing necessary legal and regulatory mechanism. The major elements of this regulatory framework include a broad specification of products to be permitted, nature of participants in the markets, distinct responsibilities for market makers and users for all OTC derivatives, pricing, effective reporting

systems for capturing systemic information and focus on developing market infrastructure for post-trade clearing and settlement.

Derivative Products

Here's a quick look at the basic derivative contracts and variations:

- *Forward contracts* are contracts negotiated between two parties to purchase and sell a specific quantity of a financial instrument, foreign currency, or commodity at a price specified at origination of the contract, with delivery and settlement at a specified future date.
- *Forward-rate agreements* are widely used to manage interest rate risk, are forward contracts that specify a reference interest rate and an agreed-upon interest rate (one to be paid and one to be received) on an assumed deposit until a specified future date.
- *Futures contracts* are forward-based contracts to make or take delivery of a specified financial instrument, foreign currency, or commodity at a specified future date or during a specified period at a specified price or yield. Futures are standardised contracts traded on an organised exchange.
- *Interest-Rate Swaps (IRS)* are where one party generally agrees to make periodic payments, which are fixed at the outset of the swap contract. The counterparty agrees to make variable payments based on a market interest rate (index rate).
- *Foreign-currency swaps* are used to fix the value of foreign exchange transactions that will occur in the future. Foreign-currency swap contracts are also used to transfer a stream of cash flows denominated in a particular currency or currencies into another currency or currencies.
- *Option contracts* are traded on an exchange or OTC. Option contracts allow, but do not require, the holder (or purchaser) to buy (call) or sell (put) a specific or standard financial instrument, at a specified price during a specified period (an American option), at a specified date (a European option), or dates (a Bermudian option).

Besides the above, there are multiple variants and combinations of swaps and options contracts such as basis swaps, equity swaps, commodity and mortgage swaps, interest rate caps, floors, collars and swaptions.

An auditor needs to obtain reasonable assurance to state whether an adequate internal controls system is maintained and whether such internal financial controls system operated effectively in the bank in all material respects with respect to financial reporting.

Inherent Risks in Derivatives

Although derivatives are valuable tools for banks, like all financial instruments they contain risks that must be managed. Managing these risks should not be considered unique or singular. Rather, doing so should be integrated into the bank's overall risk management structure. Fundamentally, the risk of derivatives is a function of the timing and variability of cash flows. These risks have been explained below:

Risks	Definition
Counterparty credit risk	This is the risk of that the counterparty to a transaction could default or deteriorate in creditworthiness before the final settlement of a transaction's cash flows. In accounting terms this risk could be quantified through a valuation adjustment known as Credit Value Adjustment (CVA)/ Debit Value Adjustment (DVA).
Settlement risk	Settlement risk is the related exposure that counterparty may fail to perform under a contract after the institution has delivered funds or assets according to its obligations under the contract. Settlement risk relates almost solely to OTC derivative contracts.
Concentration risk	Concentration risk broadly defines the sensitivity of the entity to an excessive concentration of exposure to specific counterparties, industry sectors, geographical locations, or individual transactions.
Market risk	Market risk relates broadly to economic losses due to adverse changes in the fair value of the derivative. This can be extended to include price risk and liquidity risk.
Price risk	Price risk relates to changes in the level of prices due to changes in (a) interest rates, (b) foreign exchange rates, or (c) other factors that relate to market volatilities of the rate, index, or price underlying the derivative.

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Risks	Definition
Liquidity risk	Liquidity risk relates to changes in the ability to sell, dispose of, or close out the derivative, thus affecting its value. This may be due to a lack of sufficient contracts or willing counterparties.
Valuation or model risk	Valuation or model risk is the risk associated with the imperfection and subjectivity of models and the related assumptions used to value derivatives.
Legal risk	Legal risk relates to losses due to a legal or regulatory action that invalidates or otherwise precludes performance by the institution or its counterparty under the terms of the contract. Such risk could arise, for example, from insufficient documentation for the contract, adverse changes in tax laws, or statutes.
Control risk	Control risk relates to losses that result from the failure (or absence) of controls to prevent or detect problems (such as human error, fraud, or system failure) that hinder an institution from achieving its operational, financial reporting, or compliance objectives.

Audit Approach to Treasury Operations and Derivatives

An auditor needs to obtain reasonable assurance to state whether an adequate internal controls system is maintained and whether such internal financial controls system operated effectively in the bank in all material respects with respect to financial reporting. Given the nature of treasury operation and the volumes involved, one has to adopt a risk-based approach to audit. A combination of control testing and use of substantive procedures would be an ideal approach to an audit of a bank's treasury operation over Completeness (C), Existence (E), Accuracy (A) and Valuation (V) assertions. Controls testing is segregated into higher level controls and operating controls. Substantive testing is segregated into test of details and analytical procedures.

Investments

SLR investments (Government securities) form a significant part of bank's treasury operations. Investments in Government securities are made

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mainly for compliance with Statutory Liquidity Ratio requirements or held with a view to benefit from the interest rates movements or parking of excess liquidity. The following are the key audit procedures for audit of investments portfolio:

- Existence of board approved investment policy
- Management review of portfolio and profitability by dealer
- Daily reconciliation of custodian/PDO statements with the books of account
- Daily reconciliations of FO and BO
- Reconciliations of related nostros and suspense accounts
- Cut off procedures at period end
- Independent confirmation to custodians/PDO
- Independent download of FIMMDA rates and re-perform the valuation.

Derivatives

High level controls (C, E and A)

- Existence of board approved risk management policy in compliance with regulatory requirements
- Counterparties are reviewed for credit worthiness and suitability and appropriateness aspects of the products being offered and approved by designated authority prior to establishing trading relations
- Management review of report comparing exposures to credit limits and evidence of action taken for excess exposures
- Management review of portfolio and profitability by product and by dealer
- Management review of aged analysis of reconciling items and evidence of resolution
- Management review of controls over customer complaints and subsequent resolutions.

High level controls (V)

- Existence of approved valuation policy and assess adequacy whether it meets the fair value test
- Existence of approved policy on particulars of the models used for valuation of derivative products, including the quantitative algorithm

Operating controls and substantive testing for C, E, A and V of derivatives

What could go wrong	What controls should a bank have?	Audit procedures (test of controls)	Audit procedures (Substantive procedures)
All transactions are not recorded completely and accurately	<ul style="list-style-type: none"> Deal tickets are sequentially numbered and deals are sequentially recorded Daily reconciliation of custodian and clearing house statements with the books of account Day end rate scan of prices by MO Daily reconciliations of FO and BO Reconciliations of related <i>nostros</i> and suspense accounts 	<ul style="list-style-type: none"> Verify maker-checker controls (4 eye control) over processing and recording of the transactions Involvement of IT specialists depending on the extent of automation in the processes Verify controls over daily reconciliations of custodian and clearing house Verify controls over FO and BO reconciliations Verify controls over reconciliation of suspense accounts and treasury Nostro 	<ul style="list-style-type: none"> Perform cut off procedures at period end Verify period end reconciliations of position, suspense account, treasury <i>nostros</i> and subsequent clearance of unreconciled items Review profitability against budgets and previous periods Perform analytical procedures
Transactions do not exist in the books of account	<ul style="list-style-type: none"> Controls over verification of deal slips prepared by dealer and authorised by BO basis dealer conversation slips, voice recording systems, other transcripts Confirmations obtained from counterparties 	<ul style="list-style-type: none"> Verify controls over obtaining deal confirmations Verify controls over mark to market confirmation sent to counterparties 	<ul style="list-style-type: none"> Verify validity of trades by vouching transactions to dealer conversation slips, voice recording systems, other transcripts, deal tickets, confirmations received from the counterparty, premium/ fees received on trades Send independent confirmations for notional amount and other key deal parameters
Incorrect valuation of derivative	<ul style="list-style-type: none"> All the model inputs should be observable market variables Rates used to mark trading securities to market are obtained from a recognised source and checked by a person independent of the dealing room Input and verification controls exist over input of rates used for revaluations Independent Price Verification (IPV) wherein internal prices and parameters used to value positions are compared to a corresponding set of independently verifiable external prices and parameters 	<ul style="list-style-type: none"> Verify controls over source of inputs and appropriateness with regard to the product being valued In case valuation models are used, verify the process in the bank to validate these models and understand how the model outputs are corroborated with market information. Use of valuation specialists needs to be considered Understand the banks practice of refining model based valuations to reflect current market conditions 	<ul style="list-style-type: none"> Independently download or sight the download of rates used for valuation Verify accuracy of inputs in the valuation model as per the valuation policy Wherever market quotes are obtained, ensure that the bank has obtained quotes from multiple sources and same are from active market participants Re-performance of year end valuation by valuation specialists Verify results of IPV and understand how management has addressed difference in FV as per its internal valuations and IPV

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What could go wrong	What controls should a bank have?	Audit procedures (test of controls)	Audit procedures (Substantive procedures)
Rogue trader	<ul style="list-style-type: none"> • Trades done on intra-desk needs to be subjected to stringent control processes to avoid fictitious trades getting recorded for showing trading P&L • Appropriate checks and balances to monitor cancellation and amendments of trades • Policy and control over late booking of trades • Review of desk P&L's at a gross position level. Net P&L's camouflage losses at individual trade level • Adequate MIS to monitor open positions and P & L • Mandatory leave policy for front desk • Independent confirmation process 	<ul style="list-style-type: none"> • Assessment of the bank's monitoring framework governing treasury operations • Assessment of control culture in a bank dictates the work ethics in which the treasury operations are conducted • Understanding of the levers of the business and operations – what incentivises the trader and how can he circumvent controls for personal profiteering • Verify policy and control over late booking of trades, to avoid those getting captured in the bank's risk reporting system • Verify controls to ensure compliance of mandatory leave policy • Verify controls over reconciliation of suspense accounts and treasury Nostro 	<ul style="list-style-type: none"> • Send independent confirmations for notional amount and other key deal parameters • Obtaining details of the staff not in compliance with mandatory leave policy and understanding rationale from appropriate authority • Verify period end reconciliations of position, suspense account, treasury nostros and subsequent clearance of unreconciled items • Review profitability against budgets and previous periods – Desk and dealer level

Evolving Concepts in Valuation of Derivatives Globally

In India, most of the banks use valuation models to value derivative products. Globally much more sophisticated/complex models and methodologies are used due to complex derivative products. The evolution of derivative valuation practices in the market continues. Over the years, refinements have been made to valuation models to reflect current market conditions. The following is a summary of evolving global market valuation practices in derivatives space:

- **CVA/DVA:** The fair value of derivatives must be adjusted to reflect the risk that a counter party might default on its obligations. This adjustment is called the CVA. Fair value of liabilities needs to include suitable adjustment for the possibility that the bank might not fulfil its obligations,

because third parties would take this into account in their pricing. This is commonly referred to as DVA.

- **Change in Valuation Approach for Collateralised Derivatives:** Participants are now using Overnight Indexed Swap (OIS) curve-based discounting rates as opposed to the previous market wide assumption of using LIBOR based discounting. When a derivative is collateralised then OIS rates drive the funding cost/benefit of the trade and hence are viewed as a more appropriate discounting rate than LIBOR.
- **Funding Spreads:** The move of collateralised derivatives to OIS-based discounting renewed the debate about whether it is still appropriate to value uncollateralised derivatives based on LIBOR discounting. Ongoing refinement of the derivative valuation process has led to

significant industry discussions in respect of Funding Fair Valuation Adjustment (FFVA) which involves incorporating bank's cost of funding within the valuation of uncollateralised derivative positions.

- **Prudent Valuation:** In more judgemental situations there is often an acceptable range of fair values for a product at a point in time as opposed to a single 'answer'. Regulators globally are emphasising the concept of 'prudent valuation' where, for capital purposes, as opposed to accounting fair value, valuations are set at the bottom of the range.
- **On the Horizon for Derivative Valuation Theory:** Regulatory expectations and market standards around price testing have increased significantly post crisis, pushing for much more focus on evaluating matters such as indicative levels versus firm bids, reliance on single quotes, evaluating 'disconfirming' quotes in the range, acceptable price

testing tolerances, testing values not inputs, etc.

- **Cost of Capital:** One other current topic of discussion is the extent to which the cost of capital impacts valuation, and hence needs to be included in valuation modelling.

Conclusion

An audit of treasury operations, particularly derivatives, invariably provides a challenge to experience and novice audit team members. Assuming technical competence in terms of a deep understanding of nuances of derivatives business and products, a robust and effective treasury audit demands a strong understanding of a holistic view of the bank's operations, including its risk management framework and valuation policies. With the evolving business needs, improved sophistication and valuation challenges, the future of derivatives world will be more exciting. ■