

*Over-the-Counter Derivative Markets in India: Issues and Perspectives**

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The present article tries to put in perspective the boundary conditions, imposed by the macroeconomic constraints, which have guided the evolution of over-the-counter (OTC) markets in India and underlines the point that the process of transiting from a predominantly OTC-based model to an exchange-traded model needs to follow a calibrated path. Through this transition period, the overall regulatory approach towards OTC derivative markets is as important as addressing the transactional aspects.

In India, unlike the developed financial markets where OTC derivative markets epitomised complex, unregulated financial innovations that grew exponentially over the last two decades, the OTC derivative markets have evolved within a regulated space. 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 marketmakers and users for all OTC derivatives, effective reporting systems for capturing systemic information and focus on developing market infrastructure for post-trade clearing and settlement.

Given the above context, the OTC space in India for interest rate and forex derivatives will continue to operate in a regulated manner with increased transparency. New instruments for exchanges will be introduced in a gradual manner, as hitherto. Further, areas for strengthening the functioning of OTC markets will include greater standardisation of OTC derivatives and extending central clearing arrangements for such contracts where feasible. Work has already been

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initiated for designing a centralised trade reporting system for all OTC derivatives for better systemic oversight and market transparency.

The over-the-counter (OTC) derivative markets, in particular credit derivatives, are now perceived as the weak link in the financial system that increased the systemic risk of contagion and exacerbated the financial crisis globally. Their complex and non-transparent nature coupled with a light-touch regulatory approach towards them resulted in excessive counterparty exposures and risk concentrations building up through the system. Naturally there has been a concerted effort globally to reform the OTC derivative markets, with much of the debate focusing on measures to address the issues of counterparty credit risk and non-transparency. The revised template for reforming these markets, as is being pursued in major jurisdictions, therefore broadly envisions greater standardisation of contracts to make them eligible for central clearing, tighter counterparty risk management norms and higher capital charges for all clearing-ineligible contracts and making these markets more transparent.

The OTC derivatives are generally considered superior to exchange-traded derivatives in their amenability to customisation to cater to specific risk management needs of clients. OTC markets are also best suited to test innovative products, let them stabilise and get refined, before these are considered suitable for wider offering through standardisation. However, the explosion in the OTC derivative volumes over the past decade

globally has largely been a result of these markets moving out of the regulatory perimeter as part of a conscious policy stand. The regulation of financial markets in key developed markets was reinterpreted as being limited to regulation of the conduct of business aspect on exchange-traded markets, under the presumption that the risks in OTC derivative markets would best be addressed through entity regulation. As is now evident, this approach was found to be inadequate, since the entity regulation itself relied heavily on banks' own risk management frameworks and more importantly, risks building up in the OTC space at the systemic level were lost sight of.

In contrast to the above, the predicament for countries such as India is qualitatively different from the developed countries in terms of the nature and evolution of the OTC derivative markets as well as the regulatory approach towards these markets.

1. Contextual Considerations

Exchange traded derivative markets, to be efficient and complete, require a certain set of policy framework for the underlying markets. Essentially, what the exchange-traded markets demand, are friction-free underlying markets with no restrictions on taking long or short positions and a seamless integration between different segments enforced through free participation by all agents. In simple words, efficient exchange-traded derivative markets and controls in the underlying market do not go together.

This is a fundamental challenge faced by the policymakers in economies where macroeconomic and structural constraints as well as financial stability considerations necessitate certain restrictions on the underlying markets. In the case of India, for instance, there are policy-imposed limitations on participation by various economic agents. There is still a requirement of an underlying exposure for undertaking forex derivative transactions. Most importantly, the real sector tolerance for high volatility in exchange rates as well as interest rates is limited and this makes policy interventions in the cash markets an additional variable to contend with.

While exchange-traded derivative markets do not fit into this framework, whatever their operational benefits, OTC markets make it feasible to pursue market development in a gradual framework within the given constraints. This is precisely what has happened in India where OTC derivative markets have evolved to significant volumes.

It would be imperative to recognise the above considerations while chalking out the reform path for OTC derivative markets in India. The nuanced terms of the reform proposals will need to focus more on strengthening the OTC market framework instead of being embroiled with binary consideration of OTC *vis-a-vis* exchanges.

2. Evolution Of OTC Derivatives

The financial derivative markets in India have evolved through a reform process over the last two decades, witnessed in its growth in terms of size, product profile, nature of participants and the development

of market infrastructure. At present, the following categories of derivatives are permitted:

	OTC	Exchange-traded
Rupee interest rate derivatives	Forward rate agreements, Interest rate swaps	Interest rate futures
Foreign currency derivatives	Forwards, Swaps, options	Currency futures
Equity derivatives		Index futures, index options, stock futures, stock options

The OTC derivative markets in India, unlike the developed financial markets where these markets epitomised complex, unregulated financial innovations, have evolved within a regulated space. The process of evolution needs to be seen in perspective of the boundary conditions imposed by the broader macroeconomic framework for the development of the financial sector.

The process of financial market reforms in India is less than two decades old. It was in March 1993 that a system of market-determined exchange rates was adopted by India as part of a broad set of structural reform measures. Gradually, financing the fiscal deficit transitioned from automatic monetisation to market-based borrowings resulting in a regular supply of marketable securities. With regard to exchange rate, it was in August 1994 that the rupee was made fully convertible on current account. These reforms allowed increased integration between domestic and international markets and created a need to manage interest rate and currency risks.

It was in the above backdrop that a menu of OTC products was introduced to

enable the economic agents to manage their risks in an effective manner. Being a bank-dominated system, it was natural that these products were offered through the OTC market with banks acting as intermediaries. On the forex side, apart from forwards, which were in existence for long, cross-currency options not involving rupee, foreign currency-rupee options and swaps were permitted for customers who have foreign currency exposures. The fundamental requirement of existence of an underlying commercial transaction for entering into a derivative, both on current or capital account, has remained through the years. The determination of underlying exposure is largely based on current exposure and past performance for trade-related transactions. However, as an exception, borrowers having long-term Indian rupee (INR) borrowing, were permitted to use foreign currency-INR swaps to transform these into a foreign exchange liability.

On the interest rate side, banks and primary dealers were allowed in 1999 to offer forward rate agreement (FRA) and rupee interest rate swaps (IRS) to corporates for hedging interest rate risk as also to deal in them for their own balance sheet hedging and trading purposes. The size of the OTC interest rate and forex derivative markets in India is given in the Annex.

In case of securitisation, a regulatory framework was put in place after a sizeable market had developed. The attempt was to standardise the differing practices being followed by banks and address certain concerns on accounting, valuation and capital treatment. One of the key provisions, among others, was to disallow upfront booking of profit/premium arising

on account of sale and requiring it to be amortised over the life of the securities issued by the SPV. These measures went a long way in dis-incentivising some of the innovative structures that created problems elsewhere. Furthermore, in view of the pass-through nature of the securities linked to cash flows from the underlying assets, the risk of maturity mismatches is reduced.

Credit Default Swaps (CDSs) are currently not permitted and are in the process of being introduced to provide the participants an instrument to manage their credit risk. This is also expected to aid the development of the corporate bond market. The aftermath of the crisis provides an opportunity for countries such as India, which are starting on a clean slate, to address some of the negative features associated with the product through an appropriate framework design. It is proposed to start with plain vanilla single-name CDSs on corporate bonds in the OTC market. The guidelines, to be placed in public domain, would broadly emphasise on appropriate risk management framework, greater transparency in CDS transactions and eventually providing a clearing framework.¹

From a systemic perspective, a key issue would be of induced volatility in the credit markets as a result of CDS markets. It is in this context that the issue of insurable interest becomes relevant. Permitting naked CDS may increase build-up of speculative positions across the system.

¹ Gopinath (S) (2010) : 'Pursuit of complete markets – The missing perspectives', RBI Speeches, http://rbi.org.in/scripts/BS_SpeechesView.aspx?Id=480

It may also accentuate adverse incentives by encouraging leveraged credit exposures and impeding effective resolution process. However, prohibiting naked CDS would constrain marketmaking in the product. The challenge would be to design a limit structure within which marketmaking could be facilitated by regulated entities. Stipulating risk limits such as 'risky duration'/'risky PV01'² of CDS portfolio may need to be considered.

In the exchange-traded derivative space, a more liberal approach has been adopted in the recent past. While currency futures and interest rate futures have already been introduced on exchanges, currency options on USD/INR are in the process of being introduced. While it is expected that these markets fulfil the genuine hedging requirements of the participants, it is not possible to replicate the discipline of ensuring underlying commercial transactions which is possible in the OTC market. Accordingly, the interest rate and currency futures markets operate in parallel with the OTC markets with a different set of stipulations.

3. Regulatory Framework For OTC Derivatives

Explicit regulation of OTC derivatives in India has been a key element of the policy framework which has helped in preserving systemic stability. The responsibility for the regulation of all interest rate, forex and credit derivatives, including OTC derivatives, vests with the Reserve Bank of India (RBI).

² Risky PV01 represents the value change (Present Value Impact) of the CDS when the spread moves by 1 basis point.

Legally, the Reserve Bank derives these powers from various statutes including the Reserve Bank of India Act, 1934, the Banking Regulation Act, 1949, the Foreign Exchange Management Act, 1999 and the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002.

The Reserve Bank of India Amendment Act, 2006 was a key milestone in explicitly laying down the regulatory framework for OTC interest rate, forex and credit derivatives. The box gives a brief background and provisions of this amendment.

Substantively also, regulation of these markets being with the Reserve Bank makes eminent sense. The underlying variables in these markets *viz.*, interest rates and exchange rates have critical bearing on the macroeconomic management by the Reserve Bank and it is imperative that the regulation of these derivatives are aligned with the larger policy objectives of monetary and financial stability. Further, in all these markets banks are the dominant participants and the overarching role of the entity regulator for banks, *i.e.*, the Reserve Bank provides the requisite synergy.

The major elements of the regulatory framework for OTC derivatives include a broad specification of products to be permitted, nature of participants in the markets, distinct responsibilities for marketmakers and users for all OTC derivatives, effective reporting systems for capturing systemic information, governance and oversight, and focus on developing market infrastructure for post-trade clearing

Box 1: Reserve Bank of India Amendment Act, 2006

In 1999, by the Securities Laws (Amendment) Act, 1999, section 18A was inserted in Securities Contracts (Regulation) Act, 1956 (SCRA) which reads as under :

'18A. Contracts in derivative – Notwithstanding anything contained in any other law for the time being in force, contracts in derivative shall be legal and valid if such contracts are:

(a) traded on a recognised stock exchange;
(b) settled on the clearing house of the recognised stock exchange, (c) in accordance with the rules and bye-laws of such stock exchange.'

In view of the said section 18A of SCRA, a doubt was raised about the legality of OTC derivatives such as forward rate agreements and interest rate swaps permitted under the Reserve Bank guidelines issued in July 1999. It was felt that these OTC derivatives could be deemed as wagering contracts and, as such, void under section 30 of the Indian Contract Act, 1872 and not legally valid under section 18A of SCRA.

Recognising that OTC derivatives play a crucial role in reallocating and mitigating the risks of corporates, banks and financial institutions, and that the ambiguity regarding the legal validity of OTC derivatives inhibits the growth and stability of the market for such derivatives, suitable amendments, effective January 9, 2007, were carried out to the Reserve Bank of India Act, 1934 (RBI Act).

Section 45V of RBI Act, 1934 (inserted by Reserve Bank of India (Amendment) Act, 2006) lays down that notwithstanding anything contained in SCRA or any other law for the time being in force, transactions in such derivatives, as may be specified by the Reserve Bank from time to time, shall be valid, if at least one of the parties to the transaction is the Reserve Bank, a scheduled bank, or such other agency falling under the regulatory purview of the Reserve Bank under the RBI Act, the Banking Regulation Act, 1949, the Foreign Exchange Management Act, 1999, or any other Act or instrument having the force of law, as may be specified by the Reserve Bank from time to time. It also provides that transactions in such derivatives, as had been specified by the Reserve Bank from time to time, shall be deemed always to have been valid.

The Act further gives powers to the Reserve Bank under Section 45W to "...determine the policy relating to interest rates or interest rate products and give directions in that behalf to all agencies or any of them, dealing in securities, money market instruments, foreign exchange, derivatives, or other instruments of like nature as the Bank may specify from time to time." However, the directions shall not relate to "the procedure for execution or settlement of the trades" in respect of transactions on exchanges.

and settlement. The underlying rationale for key stipulations is explained below.

(i) *There is a requirement that for an OTC derivative transaction to be legally valid, one of the parties to the transaction has to be a RBI regulated entity.* This is to ensure that the entire OTC derivative market is within the regulatory perimeter. Prudential prescriptions for each class of

participants may be decided by the respective regulator within the broad policy framework but it makes systemic monitoring possible.

(ii) *There is a clear distinction between the roles of marketmakers and users for all OTC derivatives.* It is the marketmakers which function as risk transferors in the system. It is extremely important that these entities function in a totally

- transparent and regulated manner. Only banks and primary dealers, in case of certain interest rate derivatives are permitted to act as marketmakers since extending this facility to all agents can result in risks building up on the balance sheets of such entities.
- (iii) *The users, including financial entities, are permitted to transact in derivatives essentially to hedge an exposure to risk or a homogeneous group of assets and liabilities or transform an existing risk exposure.* This stipulation is essentially to restrict speculative trading in derivatives by the real sector, whose primary economic interest in undertaking derivative transactions should be to hedge their exposures.
- (iv) *Derivative structured products (i.e. combination of cash and generic derivative instruments) are permitted as long as they are a combination of two or more of the generic instruments permitted by the Reserve Bank and do not contain any derivative as underlying.* Structured products entail packaging of complex, exotic derivatives into structures that may lead to increased build-up of risks in the system. Some of these structures may simply be unsuitable for a large section of users given their complexity. Most importantly, if left unregulated, these structures may exploit the clear regulatory arbitrage by offering hidden payoffs that are otherwise not allowed on a standalone basis.
- (v) The responsibility for assessment of customer suitability and appropriateness is squarely on the marketmaker. There are a detailed set of requirements that the marketmaker needs to fulfill in this regard while selling any product to a user. As the recent experience in many countries shows, inappropriate understanding of complex derivatives by the buyers of these can have serious repercussions. The argument of *caveat emptor* does not really work in practice, as many countries are realising on account of huge derivative losses. It is ultimately a systemic issue and it is important, in the interest of sellers of the products as well, that sufficient suitability assessment is done before selling the product.
- (vi) *All OTC forex and interest rate derivatives attract a much higher credit conversion factor (CCF) than prescribed under the Basel framework and all exposures are reckoned on a gross basis for capital adequacy purpose.* The applicable CCFs were increased in 2008 since it was felt that the conversion factors prescribed under the Basel framework did not sufficiently capture the market volatility of underlying variables in the Indian context.
- (vii) *Exposures of banks to Central Counterparties (CCPs) attract a zero risk weight as per Basel norms. Additionally, collaterals kept by banks with the CCPs attract risk weights appropriate to the nature of the CCP as reflected in the ratings under the Basel II Standardised Approach.* The latter was incorporated

by the Reserve Bank as CCPs cannot be considered risk-free entities.

- (viii) *All permitted derivative transactions, including roll over, restructuring and novation are required to be contracted only at prevailing market rates.* This ensures that non-market rates are not used to manipulate cash flows current and future.
- (ix) *There are regulations for participation by non-residents in derivative transactions.* This basically flows from the capital account management framework which places certain restrictions for participation by non-resident investors in the forex and interest rate markets.³

4. Clearing and Settlement Infrastructure for OTC Derivatives

In India, as early as in 2002, the Clearing Corporation of India Ltd (CCIL) commenced guaranteed settlement of inter-bank spot forex transactions and all outright and repo transactions in government securities, whether negotiated or under order-driven systems. CCIL has commenced non-guaranteed settlement of OTC trades in IRS/FRA in November 2008, covering over 75 per cent of the market turnover. CCIL

³ Foreign investment in rupee debt securities, both sovereign as well as corporate, is permitted only within prescribed limits. This follows from the broader capital account management framework, which has favoured freer foreign investment in equity markets and a limited access in the debt markets. Non-residents are also not permitted to freely transact in forward markets; a limited window has been allowed to non-resident investors to hedge their currency risk in respect of their investments in India.

also offers certain post-trade processing services like resetting interest rates and providing settlement values to the reporting members. Guaranteed settlement of these trades is expected soon. CCIL also acts as central counterparty for spot and forex forward trades.

With the enactment of the Payment and Settlement Systems Act, 2008 the Reserve Bank has the legislative authority to regulate and supervise payment and settlement systems in the country. The clearing and settlement facilities offered by CCIL are governed by the risk management processes which are assessed by the Reserve Bank through its offsite monitoring and onsite inspections. The margins with the CCIL are maintained in the form of cash and government bonds ensuring the quality and liquidity of the settlement guarantee fund.

5. Transparency and Reporting

The aggregate trade data relating to all OTC derivatives is required to be reported by banks on a regular basis. On the forex side, while banks are required to report aggregate daily sales/purchases of forex forwards and swaps, data relating to options is collected on a weekly basis. Additionally, as part of regulatory reporting, banks report to the Reserve Bank product-wise notional principals of their outstanding derivative exposures on a monthly basis, indicating the bifurcation between trading book and banking book, and benchmark-wise details of interest rate swaps. They also report related credit risk exposure to their top ten counterparties each in the financial and non-financial sectors.

In the recent past, important initiatives have been taken to enhance reporting disaggregated trade data for OTC derivative transactions. A start was made in 2007 when all banks started reporting the inter-bank interest rate swap (IRS) trade data on-line to CCIL. The collection of client-level trade data from banks has also started on a weekly basis from October 2009. The traded price range and volume data on inter-bank trades is also being disseminated publicly for market transparency.

Going forward, a Working Group is looking into the issue of a single-point centralised comprehensive reporting of all OTC derivatives. The objective is two-fold: to make the reporting more meaningful for regulatory assessment as well as market transparency and to have a single-point reporting platform for all market transactions.

6. Issues Going Forward

Given the above context, the OTC market in India for interest rate, forex and credit derivatives will continue to operate within a regulated framework with increased transparency. New instruments for exchanges will be introduced in a gradual manner, as hitherto. Further areas for strengthening the functioning of OTC markets will include greater standardisation of OTC derivatives and suitably extending central clearing arrangements for such contracts where feasible.

However, there are a few open issues which need to be addressed:

(i) **Contract standardisation:** Standardisation is one of the prerequisites of moving

contracts towards central clearing. There is merit in going by the argument put forth in a recent Financial Services Authority (FSA) paper that there are benefits from pursuing greater standardisation in itself, irrespective of whether these products are then cleared or traded on an exchange. Given the vanilla nature of products permitted in the Indian context, standardisation for existing products may not be difficult.

(ii) **Bilateral collateralisation:** Though bilateral collateralisation is considered an efficient, though sub-optimal, solution to central clearing, it involves significant trade-offs.

- Move towards increased collateralisation could increase cost for hedging by the real sector and place huge premium on availability of good quality collateral. In case of client trades, it may need to be recognised that a bank-client relationship is a much broader one and could include a credit relationship as well. Provision of a facility-wise collateralisation may work against the smaller clients which face difficulties in managing liquidity on a daily basis.
- Operationally, collateralisation is effective only if the exposure is calculated frequently and there is a mechanism to exchange collateral dynamically. Who would ensure this? It will invariably again be the bank's own model which will be used to arrive at both the exposures in favour or against the bank.

- From a systemic perspective, there is also the issue of procyclicality that gets hardwired in the system through mark-to-market based collateralisation and this would be equally applicable in the central clearing model.
- (iii) **Push towards central clearing:** While CCP model is accepted as an ideal solution, from a counterparty risk perspective, it is being increasingly recognised that a universal acceptance of CCP model would result in the concentration of risks at one point, which would potentially become the single point of failure for market stability. Certain issues become extremely critical in this regard:
- Clearability of contracts would be a key issue. The essence of a CCP arrangement is netting and margining, which are contingent on homogeneity of the underlying asset, availability of reliable prices and sound risk models to capture potential future exposures. The ability of models to capture tail risks is, however, put to question post-crisis.
 - It would become imperative for the CCPs to be treated as 'too-big-to-fail' systemic entities and be brought under the oversight of the systemic regulator within a globally harmonised set of standards. In this regard one important and as-yet-unresolved question is whether CCPs should have access to the central bank's credit facilities and, if so, when. Given the incentive structures and the lack of competition in such market infrastructure entities, it may be worthwhile to consider CCPs as 'public utility' and organise them as at-cost entities.
- (iv) **Higher capital requirements for non-cleared trades:** The Basel requirements already prescribe a capital charge for credit risk exposure of banks arising out of OTC derivative transactions. In as much as these exposures are reckoned on a gross basis, there is already a disincentive for bilaterally cleared OTC transactions as against centrally cleared transactions. To further address the systemic risks inherent in significant inter-bank OTC transactions, all such inter-bank exposures may be subject to a higher capital charge.
- (v) **Role for bespoke products:** This issue is more relevant for jurisdictions involving product regulation, as in India. The trade-off is between the requirements of the real sector and the risk assessment of the product. To give an example from our experience, certain zero-cost forex option/swap structures were permitted in the past to enable better design of hedging solutions for clients. These cost reduction structures, introduced in 1996 inherently involved a trade-off between reduction in the cost of hedging and retention of part of the downside risk. The concerns relating to proper valuation, mis-selling of such products and other irregularities that emerged in the recent past forced a re-evaluation of the propriety of allowing such products in India.

However, interestingly, many corporates and industry associations represented that prohibiting cost reduction structures will seriously impede the dynamic forex risk management operations of corporates and their competitiveness in the global markets. It has been suggested that structures may be allowed with additional safeguards to address the leverage and mis-selling issues.

It would be interesting to see how the global debate in regard to the reform of the OTC derivative markets finally settles in various jurisdictions. In some sense, the approach seems an extension of the pre-crisis regulatory philosophy in these markets, with a non-obtrusive view of financial markets and financial products *per se*, while concentrating on stronger entity regulation and conduct of business aspect of the financial markets.

It would be important for the process, to have any lasting impact, that it is supplemented with a framework for regulating markets from a systemic risk perspective as well as ensuring sound prudential framework for regulation of all financial intermediaries engaged in derivatives, exchanges and CCPs. The reform of OTC derivatives cannot be disassociated from the larger perspective of the too-big-to-fail issue, at the heart of which is limiting the proprietary trading by banks.

For countries such as India, the collective experience of the developed markets at the epicentre of the crisis and their response in terms of changes to institutional and regulatory models is a great opportunity to tread a new path. Hopefully we will find effective ways to channelise the power of financial innovation in a more constructive manner.

Annex: Size of OTC derivative markets in India

The BIS Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity in 2007 estimated that the percentage share of the rupee in total foreign exchange market turnover covering all currencies increased from 0.3 per cent in 2004 to 0.7 per cent in 2007. As per geographical distribution of foreign exchange market turnover, the share of India at USD 34 billion per day increased from 0.4 in 2004 to 0.9 per cent in 2007.

The activity in the forex derivative markets can also be assessed from the positions outstanding in the books of the banking system. As of December 2009, total forex contracts outstanding in the banks' balance sheet amounted to INR 36,142 billion (USD 774.25 billion), of which over 86 per cent were forwards and the rest options (Table 1).

With regards to interest rate derivatives, the inter-bank rupee swap market turnover, as reported

on the CCIL platform, has witnessed a decline in terms of notional sum in 2009 over 2008 before some recovery in 2010, mostly on account of early termination of the contracts through multilateral netting (Table 2). The outstanding single currency interest rate swap contracts in banks' balance sheet, as on December 31, 2009 amounted to INR 46,073 billion (USD 987 billion) in notional principal while the amount of cross-currency interest rate swaps was relatively at a lower level. The overnight index swaps (OIS) based on overnight Mumbai Inter-Bank Offered Rate (MIBOR) has been the most widely used OTC derivative for hedging interest rate risk. The market participation, however, remains much skewed with the foreign banks as the major player. The size of the Indian derivatives market is clearly evident from the above data, though by global standards it is still in its nascent stage.

Table 1: Outstanding Derivatives of Banks: Notional Principal Account

S. No	Item	March 2007		March 2008		March 2009		December 2009	
		INR billion	USD billion	INR billion	USD billion	INR billion	USD billion	INR billion	USD billion
1.	Foreign exchange contracts	29,254	671.12	55,057	1,377.46	50,684	994.78	36,142	774.25
2.	Forward forex contracts	24,653	565.57	47,360	1,184.89	44,669	876.72	31,190	668.17
3.	Currency options purchased	4,601	105.55	7,697	192.57	6,015	118.06	4,952	106.08
4.	Futures	2,290	52.53	2,743	68.63	3,511	68.91	3,447	73.84
5.	Interest rate related contracts	41,958	962.56	85,430	2,137.35	44,803	879.35	46,434	994.73
6.	Of which:								
	single currency interest rate swaps	41,597	954.28	85,159	2,130.57	44,377	870.99	46,073	987.00
7.	Total-Contracts/derivatives	73,502	1,686.21	143,230	3,583.44	98,998	1,943.04	86,023	1,842.82

Source: RBI

Table 2: Outstanding Volume in IRS for Various Benchmarks

	MIBOR ¹			MIFOR ²			INBMK ³		
	Notional Sum		No. of Trades	Notional Sum		No. of Trades	Notional Sum		No. of Trades
	INR billion	USD billion		INR billion	USD billion		INR billion	USD billion	
End-March 2008	36,556	838.63	61,665	6,116	140.31	16,528	137	3.14	368
End-March 2009	13,940	348.76	23,732	4,680	117.09	11,803	187	4.68	461
End-March 2010	17,488	343.24	29,853	3,269	64.16	8,201	204	4.00	450

1 **MIBOR**: Mumbai Inter-Bank Offered Rate: the benchmark rate published by NSE/FIMMDA based on polled rates from a panel of representative banks.

2 **MIFOR**: Mumbai Inter-Bank Forward Offered Rate: implied forward rupee rate derived from USD LIBOR and the USD/INR forward premia.

3 **INBMK**: Indian Benchmark Rate published by Reuters. This effectively presents a yield for government securities of a specific tenor.