The Indian Call Money Market

***Golaka C Nath and Payal Ghose**

The decade since the introduction of the NDS-CALL platform for trading in the uncollateralized call, notice and term money market has been an interesting one for the overall Indian money market. While the uncollateralized call segment remains the bellwether for systemic liquidity and the operating target for the central bank's monetary policy decisions, it is the collateralized segment and particularly the CBLO segment which dominates the volumes. The call market, however, still exerts significant influence on the direction of money market rates, particularly when the collateralized segments of repo and CBLO are closed for same day settlement. This write-up tracks the major changes since the call money market was transformed into a purely inter-bank market in 2005.

Prudential measures have been introduced by the Reserve Bank of India (RBI) over the years to address the extent to which banks and primary dealers (PDs) can borrow and lend in the unsecured call money market in relation to their net worth. On the other hand, it remains one of the few segments of the Indian financial markets where transactions are not cleared and settled on a guaranteed basis through a central counterparty. It is found that more the things have changed, the more they have stayed the same for a sizable portion of the call market which remains characterized by substantial concentration on the borrowing side. This high level of concentration in a small but significant part of the financial system has high potential risk of ripple effects across the board. The risk is heightened given the participants on the lending side are generally not so active in other segments.

History

Call money refers to the unsecured segment of the money market that is designed for management of liquidity for a very short period of time - mostly overnight. If the period is more than one day and upto 14 days it is called 'Notice money'. Money lent for 15 days to 1 year is called 'Term money'. The call market enables banks to even out their day-to-day demand for and supply of short-term funds. This market is a purely unsecured market as no collateral is offered for securing the funds and there are no brokers involved. Settlement is done between the participants through the current account maintained with the RBI. The ease of transacting as well as the low transaction costs arising from least documentation and same day settlement of funds act as strong incentives for banks to access the call money market for managing intra-day funding requirements. The call market has traditionally facilitated banks in maintaining reserve requirements.

In the past, the call market witnessed unusual rates due to acute asset liability mismatch of banks at the shorter end especially at the close of the financial year. Banks used to be overly exposed to the call money market. RBI focused on the development of the Indian money market in India particularly from the mid-1990s, in terms of refinements in money market instruments, introduction of new instruments and supplementary measures to add depth and liquidity to the market. The emerging

***Dr. Golaka C Nath** is *Senior Vice President*, Economic Research and Surveillance, Membership and HRD and **Ms. Payal Ghose** is *Manager*, Economic Research and Surveillance Department, **CCIL**

consensus was that access to the call market should essentially be for meeting unforeseen mismatches and not as a regular means of financing banks' lending operations.

RBI's Internal Group to examine the development of call money market highlighted the highly skewed nature of the market. Despite the market having the highest turnover in Indian money market, it lacked depth and liquidity as absence of one or two major participants in either of the segments had the potential to cause sharp volatility in the market by creating artificial scarcity for funds or exploiting situations of tight monetary conditions thereby distorting the interest rate structure. It observed that Public Sector Banks with their vast branch network in the country were generally the suppliers of funds in the market while Foreign Banks and Private Sector Banks with their urban-centric structure coupled with their relatively advanced treasury operations were regular borrowers in the market.

The Narasimhan Committee II recommended clearly defined prudent limits beyond which banks were not to be allowed to rely on call/notice money market. This led to the linking of the borrowing and lending in call/notice money market to the size of the banks' balance sheets as the building up of substantial exposures relative to their balance sheet size by some participants on a continuous basis had the potential for default and consequent systemic instability. The prudential limits placed on banks, non-bank entities (mutual funds and insurance companies) and PDs in their operations in the call market and gradual phasing out of non-banks from the call market was expected to bring better integrity to this market and contribute to development of alternative instruments in the money market. Further, in order to reduce excessive reliance on short-term funding, banks were also advised to set a cap on inter-bank borrowings, especially call borrowings. This gradual move to a purely inter-bank market has slowly brought about much needed discipline and robustness to the market.

Timeline of Important Events in the Indian Call Money Market

1930-1960	The inter-bank call money market was the core of the Indian money market.
1971	LIC and UTI were permitted to lend in the call market. No brokers were permitted in the market.
1985	The Committee to Review the Working of the Monetary System (Chairman: S. Chakravarty) recommended that additional non-bank participants may be allowed to participate in call money market.
1987	The Working Group on the Money Market (Chairman: N. Vaghul) suggested that call money market should be purely an inter-bank market.
June, 1989	Freeing of interest rates in call money market, rates to be determined by the demand and supply of funds.
May, 1990	Three more financial institutions (viz., GIC, IDBI and NABARD) besides LIC and UTI were permitted to participate in the call/notice money market as lenders.
October, 1990	All the participants in the Bills Rediscounting Scheme who were not operating in the call/notice money market till then, were granted entry into the call/notice money market as lenders. Subsequently, eight mutual funds sponsored by public sector banks/financial institutions were also permitted to participate in the call/notice money market as lenders.
April, 1991	RBI decided to provide access as lenders to such entities as were able to provide evidence to RBI of bulk lendable resources. Such entities were required to observe a minimum size of operations of Rs.20 crore per transaction and such transactions were to be routed through Discount and Finance House of India (DFHI) only.

April, 1995	Mutual funds set up in the private sector and approved by SEBI were permitted as lenders.
1996	4 PDs in addition to DFHI and STCI were permitted to operate both as lenders as well as borrowers in the call/notice money market.
April, 1997	The facility of routing of transactions by lending entities with bulk lendable resources was extended to all the PDs as against only DFHI earlier and the minimum size of operations was also reduced from ₹20 crore to ₹10 crore.
October, 1997	The minimum size of above operations was further reduced to ₹5 crore.
May, 1998	The minimum size of above operations was further reduced to ₹3 crore.
1997	The Internal Group to Examine the Development of Call Money Market recommended that the call money market should be converted into a purely inter-bank market.
1998	The Committee on Banking Sector Reforms (Chairman : M. Narasimham) observed that call/notice/term money market in India, like in most other developed markets, should be strictly restricted to banks with the exception of PDs.
October, 1998	RBI indicated its intention to ultimately move towards a pure inter-bank call/notice/term money market including PDs.
February, 1998	RBI issued comprehensive guidelines on Asset-Liability Management System to be applicable from April 1, 1999. As a prudent measure, banks were advised to set caps on inter-bank borrowings, especially call borrowings.
April, 1999	RBI indicated that permission given to non-bank entities to lend in the call/notice money market by routing their transactions through PDs would be available only upto end-December 1999. This permission was, however, extended in stages upto June 2001.
December 9, 2000	RBI constituted a Technical Group on Phasing out of Non-banks from Call/Notice Money Market, which included representatives from RBI, non-banks and banks.
March 29, 2001	RBI released the report of the Technical Group for comments and suggestions.
April 19, 2001	In the Monetary and Credit Policy for the year 2001-2002, RBI indicated the framework for moving towards pure inter-bank call market. The steps included: • Permission to corporates to route their call transactions through PDs was available up to June 30, 2001, as announced in the Mid-term Review of October 2000. • Access to other non-bank institutions (including financial institutions, mutual funds and insurance companies) to operate in call/notice money market was to be gradually reduced in four stages: o In stage I, with effect from May 5, 2001 non-banks were to be allowed to lend up to 85.0% of their average daily lendings in call market during 2000-01. o In stage II, with effect from the date of operationalisation of Clearing Corporation, non-banks were to be allowed to lend up to 70.0% of their average daily lendings in call market during 2000-01. o In stage III, with effect from three months after stage II, access of non-banks to call/notice money market was to be equivalent to 40.0% of their average daily lendings in call market during 2000-01. o In stage IV, with effect from three months after stage III, access of non-banks to call/notice money market was to be equivalent to 10.0% of their average daily lendings in call market during 2000-01. From a date to be notified by RBI, after the on-set of stage IV, non-banks were not to be permitted to lend in call/notice money market.
April 19, 2001	In order to reduce the excessive reliance of some Urban Co-operative Banks (UCBs) in the call money market, RBI capped their borrowings in the call/notice money market on a daily basis at 2.0% of their aggregate deposits as at end March of the previous financial year. The existing freedom to lend in the call/notice money market continued.

<table>
<tr><td>February 15, 2002</td><td>RBI's Negotiated dealing system (NDS) became operational. RBI directed all deals in call/notice/term money among NDS members to be reported automatically through NDS, if the deal was done on NDS and within 15 minutes of concluding the deal, if done outside NDS.</td></tr>
<tr><td>June 27, 2002</td><td>RBI stipulated prudential limit on the exposure of commercial banks in call/notice money market in two stages as indicated below:
In the first stage, with effect from the fortnight beginning October 5, 2002, lending of scheduled commercial banks in the call/notice money market, on a fortnightly average basis, was capped at 50% of their owned funds (paid-up capital plus reserves) as at the end of March of the previous financial year; however, banks were allowed to lend a maximum of 100% of their owned funds on any day, during a fortnight. Borrowings by scheduled commercial banks in the call/notice money market, on a fortnightly average basis, were capped at 150% of their owned funds or 2% of aggregate deposits as at the end of March of the previous financial year, whichever was higher; however, banks were allowed to borrow a maximum of 250% of their owned funds on any day, during a fortnight.
In the second stage, with effect from the fortnight beginning December 14, 2002, lending of scheduled commercial banks, on a fortnightly average basis, was capped at 25% of their owned funds; however, banks were allowed to lend a maximum of 50.0% on any day, during a fortnight. Similarly, borrowings by scheduled commercial banks were capped at 100% of their owned funds or 2% of aggregate deposits, whichever is higher; however, banks were allowed to borrow a maximum of 125% of their owned funds on any day, during a fortnight.</td></tr>
<tr><td>July 31, 2002</td><td>RBI stipulated prudential limits on the lending and borrowing of PDs in call/notice money market as indicated below:
With effect from October 5, 2002, PDs were permitted to lend in call/notice money market upto 25% of their net owned funds (NOF).
Access of PDs to borrow in call/notice money market was to be gradually reduced in two stages:
In Stage I, PDs were allowed to borrow up to 200% of their NOF as at end-March of the preceding financial year. However, this limit was not applicable for the days on which government dated securities were issued to the market. Stage I was to be operational upon the finalisation of uniform accounting and documentation procedures for repos, allowing rollover of repos, introduction of tripartite repos or collateralised borrowing and lending obligation (CBLO) to the satisfaction of RBI and permitting repos out of available for sale (AFS) category.
In Stage II, PDs were to be allowed to borrow upto 100% of their NOF. Days on which government dated securities were issued to the market continued to be exempted from this limit. The implementation of Stage II was to commence from one month after permitting sale of repoed securities.
On implementation of the real -time gross settlement (RTGS) system, the above exemptions were to be reviewed.
The date of implementation of the Stage I mentioned above was to be notified later.</td></tr>
<tr><td>December 14, 2002</td><td>The second stage of stipulation of prudential limits on the exposure of commercial banks in call/notice money market commenced from December 14, 2002. Lending of scheduled commercial banks, on a fortnightly average basis, was capped at 25% of their owned funds; however, banks were allowed to lend a maximum of 50% on any day, during a fortnight. Similarly, borrowings by scheduled commercial banks were capped at 100% of their owned funds or 2% of aggregate deposits, whichever was higher; however, banks were allowed to borrow a maximum of 125% of their owned funds on any day, during a fortnight.</td></tr>
<tr><td>April 29, 2003</td><td>RBI policy statement indicated that Stage II of the transition to a pure inter-bank call/notice money market was to be effective from the fortnight beginning June 14, 2003, wherein non-bank participants were to be allowed to lend, on average in a reporting fortnight, up to 75% of their average daily lending in call/notice money market during 2000-01.</td></tr>
<tr><td>May 3, 2003</td><td>It became mandatory for all NDS members to report all their call/notice money market deals on NDS. Deals done outside NDS had to be reported within 15 minutes on NDS, irrespective of the size of the deal or whether the counterparty was a member of the NDS or not.</td></tr>
<tr><td>December 27, 2003</td><td>Non-bank participants were allowed to lend, on average in a reporting fortnight, up to 60% of their average daily lending in call/notice money market during 2000-01.</td></tr>
</table>

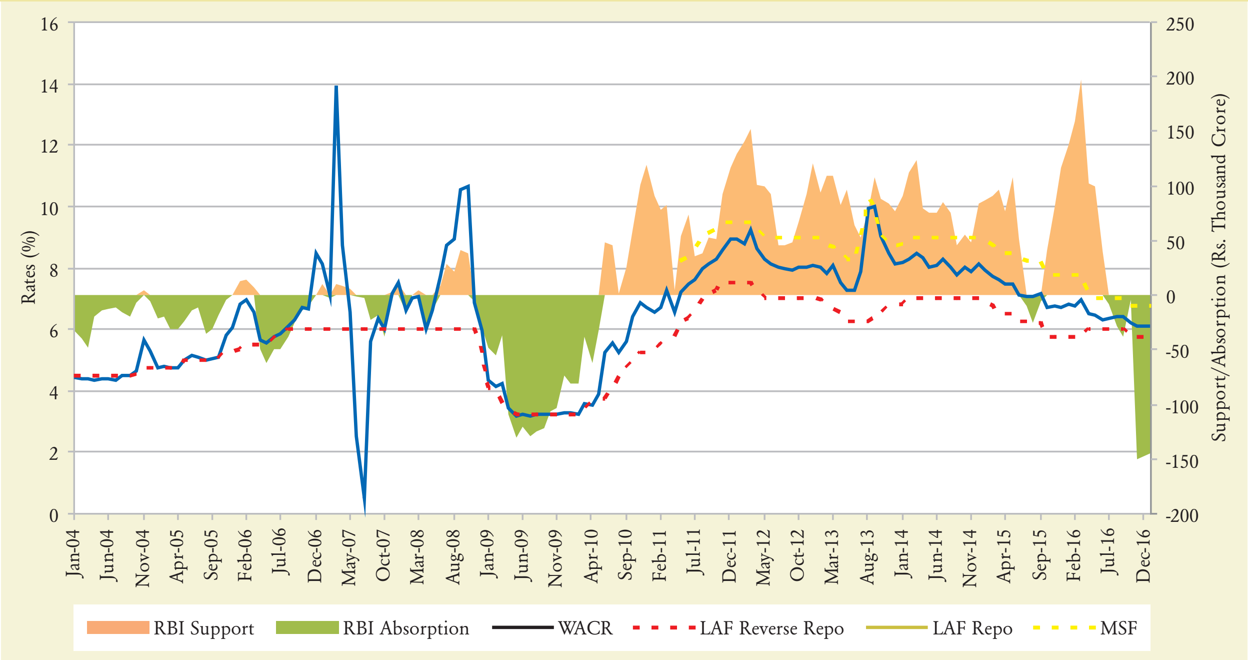
February 7, 2004	PDs were be allowed to borrow, on average basis in a reporting fortnight, upto 200% of their NOF as at end-March of the preceding financial year.
June 26, 2004	Non-bank participants were allowed to lend, on average in a reporting fortnight, up to 45% of their average daily lending in call/notice money market during 2000-01.
January 8, 2005	Non-bank participants were allowed to lend, on average in a reporting fortnight, up to 30% of their average daily lending in call/notice money market during 2000-01.
February 7, 2005	CCIL started releasing intra-day comparative money market rates of Call, Repo and CBLO markets on its website.
April 29, 2005	RBI proposed a screen-based negotiated quote-driven system for all dealings in call/notice and term money market transactions.
June 11, 2005	Non-bank participants except PDs were allowed to lend, on average in a reporting fortnight, up to 10% of their average daily lending in call/notice money market during 2000-01.
August 6, 2005	Non-bank participants, except PDs, were completely phased out from the call/notice money market.
September 18, 2006	NDS-CALL, an electronic screen-based quote driven dealing system for all Call, Notice and Term Money operations was launched by CCIL on behalf of the RBI.
January 25, 2007	CCIL launched the CCIL MIBOR (CCIL Mumbai Inter-Bank Offer Rate)/MIBID (CCIL Mumbai Inter-Bank Bid Rate) based on quotes from NDS-Call.
September 2, 2009	RBI increased the limit on borrowing by the PDs from the call/notice money market, on an average in a reporting fortnight, from the existing ceiling of 200% of their NOF to 225% of NOF, as at the end March of the preceding financial year.
April 11, 2011	The Working Group on Operating Procedure of Monetary Policy recommended that the weighted average overnight call money rate (WACR) should to be recognized as the operating target of the RBI. The operating objective was to contain this rate around the repo rate within the corridor.
May 11, 2011	RBI adopted the WACR as the operating target of monetary policy.
November 1, 2012	RBI mandated the switch in reporting of all OTC call/notice/term money deals to the reporting platform of NDS-CALL.
February 17, 2014	The Committee on Financial Benchmarks recommended shifting the computation of the market's benchmark overnight MIBID-MIBOR from the existing polling based method to volume weighted average of trades executed between 9:00 AM to 10:00 AM on the NDS-CALL platform.
March 3, 2014	RBI dispensed with the extant practice of banks, PDs and Co-operative banks approaching it for the fixing of prudential limits for transactions in call/notice money market. They were allowed, with the approval of their Boards, to arrive at the prudential limits for borrowing/lending in call/notice money market within the gamut of prudential limits prescribed by RBI.
July 22, 2015	The FBIL Overnight MIBOR was launched with CCIL as the Calculation Agent.

Operating Tool of Monetary Policy

In the call money market, funds are lent and borrowed without any collateral. This market enables banks to bridge their short-term liquidity mismatches arising from their day-to-day operations. Banks primarily borrow in the call market to meet their mandatory reserve requirements for CRR. The level of transactions and rates in the call market are thus an indicator of the overall liquidity in the system. The call rate is therefore recognized as the operating target of monetary policy and serves as a bellwether of RBI's comfort levels with systemic liquidity and the general level of interest rates in the economy. It remains close to the lower bound of the policy corridor i.e. the LAF Reverse Repo rate at which banks park their money with the RBI during surplus liquidity conditions and closer to the LAF repo rate at which RBI injects liquidity into the banking system in a tight liquidity regime. Call rates have fluctuated from 0.01% to 80% reflecting the extant systemic liquidity conditions making it the most closely tracked rate despite having lost its market share.

and unusual rates have been observed due to acute asset liability mismatch of banks at the shorter end. In 2011, RBI introduced the Marginal Standing Facility (MSF) for banks and PDs to further reduce the volatility in the inter-bank call money market. Fixed initially at 100 bps above the LAF Repo rate, it allowed banks to avail overnight funds from RBI up to 1% of their Net Demand and Time Liabilities

Liquidity and Interest Rates



Source: RBI and CCIL

(NDTL) against collateral of SLR securities and provided an informal ceiling for the call rates. The operating objective of the current regime of monetary policy is to contain the weighted average call money rate around the LAF Repo rate within the corridor. This policy has been largely successful in the past year. Granular analysis of the behavior of the WACR to policy changes has not been included in this study.

While the call rate has occasionally breached the policy rate corridor at both ends, it tends to stabilize within the corridor in the normal course. The impact of changes in the operating procedure of monetary policy is clearly echoed in the call market, especially when the system is maintained in deficit mode. Earlier overnight call rates used to be very volatile depending on the market conditions

Liquidity and Rates

Year	WACR (%)	LAF Reverse Repo (%)	LAF Repo (%)	MSF (%)	Average Daily RBI Support (₹ Crore)*
2004	4.61	4.55	6.00	-	-18,380
2005	5.12	4.97	6.05	-	-19,887
2006	6.43	5.74	6.79	-	-22,191
2007	6.62	6.00	7.67	-	-3,639
2008	7.71	5.93	8.01	-	3,842
2009	3.49	3.42	4.92	-	-97,166
2010	4.97	4.17	5.48	-	11,087
2011	7.62	6.48	7.48	8.93	65,593
2012	8.33	7.14	8.14	9.14	94,267
2013	8.28	6.52	7.52	8.94	86,886
2014	8.12	6.98	7.98	8.98	79,111
2015	7.23	6.28	7.28	8.28	57,779
2016	6.45	5.88	6.50	7.13	28,316

*Negative value indicates liquidity absorption by RBI. Values include fixed RBI LAF Repo and Reverse Repo, MSF, Variable Overnight and Term Repo and Reverse Repo auctions.
Source: RBI and CCIL

Market Infrastructure

In order to ensure transparency in the call market, RBI mandated the reporting of all such transactions on its NDS platform effective the fortnight beginning May 3, 2003 and trade wise information was made available on the RBI website. To bring about further transparency and more efficient price discovery in the uncollateralized call market, RBI launched the NDS-CALL system developed and managed by CCIL, which is a screen-based negotiated quote-driven system for all dealings in call/notice and term money markets on September 18, 2006. Following the implementation of its core banking solution, RBI mandated the reporting of all OTC call/notice/term money deals over the reporting platform of NDS-CALL from November 1, 2012 within 15 minutes of concluding the deal.

NDS-CALL Platform

A screen-based negotiated quote-driven system for all dealings in call/notice and term money markets - NDS-CALL was launched on September 18, 2006. It is an electronic screen-based negotiated quote-driven dealing platform for all dealings in call\notice\term money. The NDS-CALL system provided unique features such as:

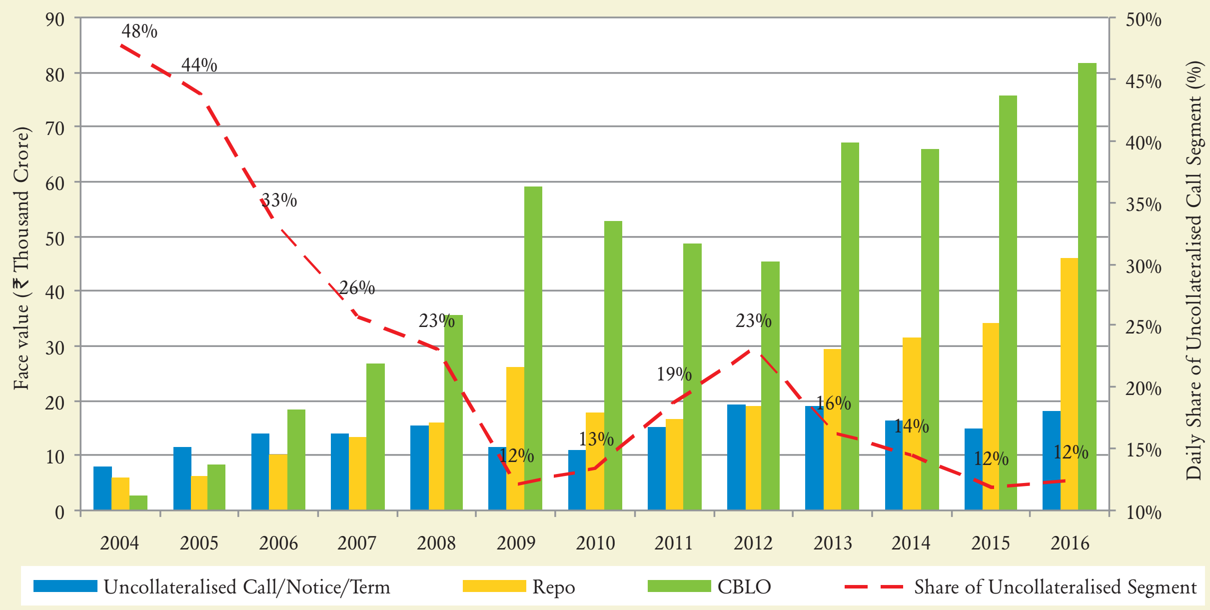
- Direct one to one negotiation feature
- Real time quote and trade information
- Preferred counterparty setup
- Online exposure limit monitoring
- Online regulatory limit monitoring
- Dealing facilitated for T+0 settlement type for Call Money
- Dealing facilitated for T+0 and T+1 settlement type for Notice and Term Money

The system has improved transparency and facilitated better rate discovery in the call money market. The system also helped to improve the ease of transactions, increase operational efficiency and resolve problems associated with asymmetry of information. Further recognition to the benefits associated with the platform including clear audit trails led to the recommendation by the Committee on Financial Benchmarks in 2014 for shifting the computation of the market's benchmark overnight MIBID-MIBOR from the existing polling based method to volume weighted average of trades executed between 9:00 AM to 10:00 AM on the NDS-CALL platform. The dissemination of the "FBIL - Overnight MIBOR" commenced from July 22, 2015.

Money Market Share

The money market provides a focal point for the RBI's operations in influencing system liquidity and thereby transmitting the monetary policy impulses. The broad policy objectives pursued for the development of money market in India include ensuring stability in short-term interest rates, minimizing default risk and achieving a balanced development of various segments of the money market. The profile of the money market has changed in the past decade with the acceptance of new instruments being the indicators of a more balanced development of the money market. The money market comprising of the uncollateralized call segment (including notice and term money), market repo and CBLO has grown almost 6 times between 2004 and 2016. While the CBLO segment has grown almost 24 times during the period, the growth in the call money segment has failed to keep pace and volumes in 2016 are just 95% more than the volumes in 2004, after peaking in 2012.

Indian Money Market - Daily Average and Share



Source: RBI and CCIL

Daily Money Market Overview (Face Value ₹ Crore)

Year	Uncollateralised Call/Notice/Term	Repo	CBLO	Share of Uncollateralised Segment
2004	7947	5883	2797	48%
2005	11437	6317	8351	44%
2006	13924	10131	18402	33%
2007	13997	13491	26845	26%
2008	15525	16184	35522	23%
2009	11726	26250	59149	12%
2010	10937	17919	52957	13%
2011	15012	16495	48700	19%
2012	19415	19123	45507	23%
2013	18887	29272	67202	16%
2014	16442	31548	65959	14%
2015	14706	34034	75823	12%
2016	17984	46031	81822	12%

Source: RBI and CCIL

This has resulted in the reduced share of the uncollateralized segment as well as the slow growth in its average volumes as compared to the other segments. Daily trading in the call market has increased from ₹7,010 crore in 2004 to ₹16,164 crore in 2016. As against this, the daily trading in the CBLO segment has increased from ₹2,468 crore in 2004 to ₹71,591 crore in 2016. The average trading in the market repo segment has increased from ₹5,112 crore in 2004 to ₹40,358 crore in 2016. The average trading in the overall market comprising the three segments has increased from ₹14,590 crore in 2004 to ₹1,28,113 crore in 2016. The share of the call market in the overall money market generally declines during ample liquidity when there is less pressing need for funds.

For the following study, the data for the money market for the period between January 1, 2013 and December 31, 2016 comprising of 961 weekdays has been used. It was observed that almost 46% of the total activity in the overnight money market takes place within the first hour i.e. between 9:00 AM and 10:00 AM, primarily led by the CBLO and repo segments. On the other hand, call money accounts for the trading in the last business hour i.e. between 4:00 PM and 5:00 PM as the cut-off timing for same day settlement is 2:30 PM for repo and 4:00 PM for CBLO. The activity is majorly concentrated in the first hour followed by the 2:00 PM to 3:00 PM time bucket.

Hourwise Activity in Money Market (%)

Year	Hour1	Hour2	Hour3	Hour4	Hour5	Hour6	Hour7	Hour8
Hourwise Share of Activity in Total Overnight Money Market (%)								
2013	49.31	8.40	5.13	6.02	11.93	11.54	3.97	3.71
2014	43.77	8.84	6.44	6.97	12.78	12.65	4.76	3.80
2015	44.94	8.98	5.50	6.52	12.19	13.36	5.15	3.36
2016	45.31	8.29	5.40	6.40	11.58	13.48	6.01	3.52
Overall Share	45.81	8.61	5.59	6.47	12.08	12.81	5.04	3.59
Share of Call Transactions in Total Overnight Money Market (%)								
2013	17.61	6.98	7.84	8.69	3.24	3.96	23.81	98.41
2014	12.60	6.46	8.70	7.65	4.54	8.77	27.23	97.88
2015	7.52	4.84	3.58	4.60	5.45	13.25	22.82	97.51
2016	7.95	8.41	5.89	5.22	3.42	6.86	33.92	98.18
Overall Share	11.25	6.71	6.45	6.40	4.16	8.35	27.81	98.01
Share of CBLO Transactions in Total Overnight Money Market (%)								
2013	45.34	68.83	75.73	74.18	78.32	86.38	76.18	1.59
2014	37.85	77.58	84.13	80.24	77.23	83.16	72.77	2.12
2015	43.85	79.08	87.15	83.49	76.15	78.86	77.18	2.49
2016	36.14	72.47	83.72	81.77	78.42	84.76	66.08	1.82
Overall Share	40.71	74.55	82.97	80.20	77.54	83.20	72.19	1.99
Share of Repo Transactions in Total Overnight Money Market (%)								
2013	37.05	24.19	16.42	17.13	18.43	9.67	0.01	0.00
2014	49.55	15.96	7.18	12.11	18.23	8.07	0.00	0.00
2015	48.62	16.08	9.27	11.91	18.39	7.89	0.00	0.00
2016	55.92	19.12	10.38	13.01	18.16	8.38	0.00	0.00
Overall Share	48.04	18.75	10.57	13.41	18.30	8.45	0.00	0.00

Source: CCIL

Overall, while the last hour accounts for a very small share of the total money market, this part is almost entirely comprised of call money deals - both trades dealt on the NDS-CALL system as well as those done over-the-counter (OTC) and then reported to the NDS-CALL system during the last hour.

Trading Behavior in the Electronic Call Market (Based on Data from NDS-CALL Platform)

Deals done over the NDS-CALL platform on an average have accounted for almost 74% of the total trading in the call market during the period. Recent years have witnessed a decline in the share of electronic deals accompanied by a commensurate increase in OTC deals.

Summary of Overnight Transactions Dealt on NDS-CALL

Year	Daily Average			NDS-CALL Share in Total Call
	Trades on NDS-CALL	Face Value - NDS-CALL (₹ Crore)	Total Uncollateralised Segment (₹ Crore)	
2007	108	8984	13997	64%
2008	140	12984	15525	84%
2009	110	9661	11726	82%
2010	98	8799	10937	80%
2011	122	12467	15012	83%
2012	147	16085	19415	83%
2013	144	14693	18887	78%
2014	139	11389	16442	69%
2015	121	9054	14706	62%
2016	143	11657	17984	65%

Source: RBI and CCIL

The response to RBI's monetary policy actions is most clearly visible in the electronic NDS-CALL segment which is free from the distortions brought in by off-market OTC deals. The response to RBI measures is visible immediately and clearly with the changes in the share of hourly volumes. Trading on the NDS-CALL platform used to be concentrated in the first hour during the initial years. As a corollary to the high share of NDS-CALL deals in the overall call market, it can be inferred that the majority of the activity in the overall call market also used to happen in the first half of the day, particularly in the first hour of trading. There was a consistent fall in the first hour trading during the RBI's stance of keeping the systemic liquidity in a deficit mode, with a sharp decline since the adoption of tightening measures to address the exchange rate volatility in July 2013.

The switch to real time settlement of LAF (since August 3, 2015) and the extension of the fixed LAF window over almost the entire day (since November 30, 2015) have resulted in the decline of last hour trading. The share of the first hour trades has increased over recent months with the April 2016 shift in RBI's liquidity management framework to progressively lower the average ex-ante liquidity deficit in the system to a position closer to neutrality. This has been accompanied by a visible decline in last hour trading on NDS-CALL. However, a significant volume of trading still takes place in the OTC segment of the call market in the second half of the day, especially after the close of the LAF Repo window.

Hourwise Share of NDS-CALL Activity (%)

Year	Hour1	Hour2	Hour3	Hour4	Hour5	Hour6	Hour7	Hour8
2007	67	9	4	3	5	5	4	3
2008	73	8	3	3	3	3	3	4
2009	72	5	3	3	3	4	4	6
2010	77	5	2	2	2	3	3	6
2011	82	4	2	2	2	2	2	4
2012	81	3	2	1	2	2	3	7
2013	65	4	2	2	2	2	4	19
2014	51	5	2	2	2	3	4	30
2015	43	5	2	2	2	3	4	38
2016	43	7	3	3	3	4	5	33

Source: CCIL

NDS-CALL rates are generally higher in the morning and then decline over the day, with a significant fall towards the day-end. The significant downward pull exerted on the WACR by day-end OTC deals done by Co-operative Banks in the recent years has led to widening of the spread of the NDS-CALL rate over WACR in the initial hours of trading. Intraday volatility in NDS-CALL rates in the initial years tended to increase towards the end of the day in thin market conditions when some banks sought funds to cover unexpected Real Time Gross Settlement (RTGS) flows. Over the years, intraday volatility has declined with the evolving fine-tuning in RBI's LAF operations. The highest volatility is generally observed in the last hour of trading.

The lending side of the market is reasonably dispersed. The top 20 lenders generally accounted for almost 87% of the total activity during the period. Public Sector Banks and Private Sector Banks are the largest lenders on NDS-CALL, followed by Foreign Banks. While during the overall period, nearly three-fourths of the funds on NDS-CALL were deployed by Public Sector Banks there has been a significant decline in their share in recent years. Public Sector Banks have deployed their funds at the lowest discount to the MIBOR, while the Primary Dealers were able to lend at a high discount to the MIBOR.

NDS-CALL MARKET SHARE (%) - LENDING

Year	Co-operative Banks	Foreign Banks	Public Banks	Private Banks	Primary Dealers
2006-07	5.58	3.36	77.11	13.19	0.77
2007-08	5.44	7.24	70.07	16.83	0.41
2008-09	6.06	11.41	66.77	15.35	0.41
2009-10	12.19	11.28	68.78	7.65	0.10
2010-11	5.79	9.68	77.27	7.21	0.04
2011-12	4.51	5.74	83.07	6.65	0.03
2012-13	10.42	4.15	81.31	4.12	0.00
2013-14	22.60	6.92	62.93	7.55	0.01
2014-15	36.51	7.69	44.17	11.63	0.01
2015-16	38.14	7.97	37.97	15.90	0.02
2016-17 (Upto Dec'16)	40.17	6.42	38.27	15.14	0.01

Source: CCIL

The data for the top borrowers indicates concentration in the market is still quite high with the top 20 borrowers accounting for 90% of the total activity on an average. Category wise breakup shows that Private Sector Banks and Foreign Banks remained the largest borrowers on NDS-CALL during this period closely followed by Public Sector Banks. Co-operative Banks had a negligible presence given the restrictions imposed by RBI since 2001 limiting their borrowing on a daily basis to a ceiling of 2.0% of their aggregate deposits as at end March of the previous financial year. The share of Primary Dealers has increased consistently since 2012. It has been observed that generally the borrowing patterns of Public Sector Banks and Private Sector Banks move in the opposite directions. Public Sector Banks are generally able to secure the highest discount to the MIBOR when they borrow on NDS-CALL.

High value deals are most common on NDS-CALL. The small ticket deals worth less than ₹1 crore generally involve Co-operative Banks, Primary Dealers or Foreign Banks. These deals also had the greatest discount to the MIBOR.

Trading Behavior in the OTC Call Market

The share of OTC deals has been steadily rising in the overall uncollateralized market particularly since June 2014 due increased lending by Co-operative banks. This has been the result of two RBI measures. With effect from March 2014, RBI dispensed with the extant practice of banks, PDs and Co-operative banks approaching it for the fixing of prudential limits for transactions in the call/notice money market. They were allowed, with the approval of their Boards, to arrive at the prudential limits for borrowing/lending in call/notice money market within the gamut of prudential limits prescribed by RBI. There is no limit on the lending activity by Co-operative Banks as per these guidelines. Further, the calibrated reduction in the mandated Statutory Liquidity Ratio (SLR) commenced by RBI in June 2014, led to a significant increase in the surplus liquidity with Co-operative Banks which they started deploying in the call money market as it was easier and safer for them to deploy funds through their correspondent banks with advanced treasuries in

NDS-CALL MARKET SHARE (%) - BORROWING

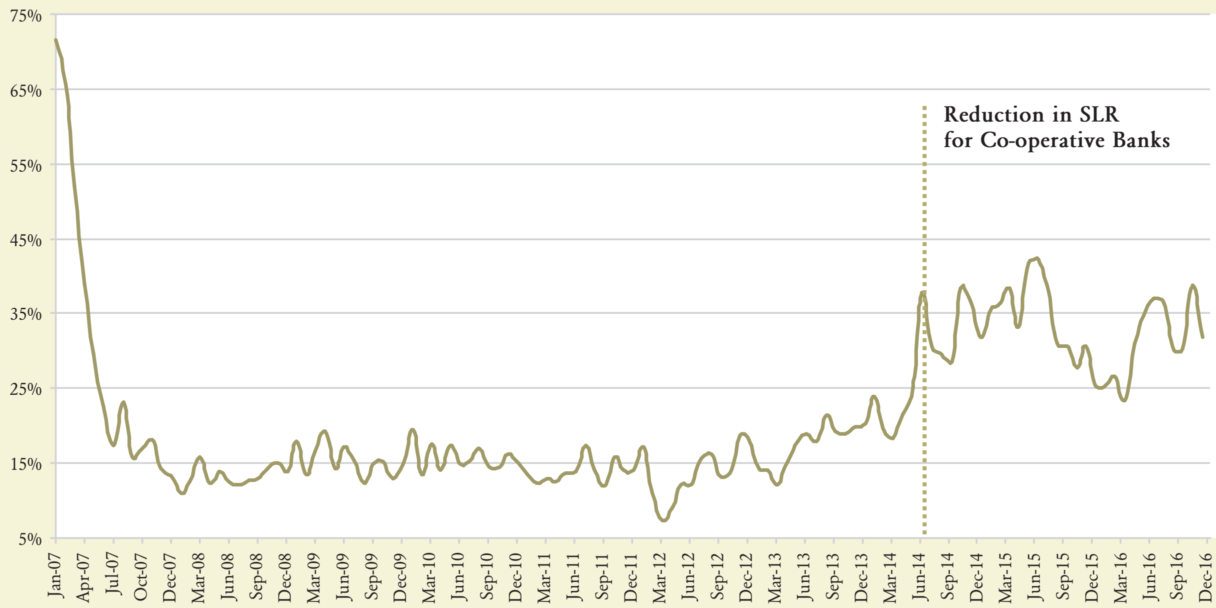
Year	Co-operative Banks	Foreign Banks	Public Banks	Private Banks	Primary Dealers
2006-07	0.02	41.56	13.20	30.92	14.29
2007-08	0.02	48.14	15.94	26.91	9.00
2008-09	0.01	31.48	27.44	33.19	7.88
2009-10	0.06	24.01	23.11	40.35	12.47
2010-11	0.33	25.82	32.98	29.99	10.89
2011-12	2.69	23.65	24.33	41.37	7.95
2012-13	5.13	21.00	15.36	46.92	11.59
2013-14	1.76	17.94	24.84	38.80	16.65
2014-15	1.42	16.95	26.76	31.31	23.57
2015-16	1.09	15.27	26.08	30.31	27.26
2016-17 (Upto Dec'16)	1.11	11.86	22.19	36.19	28.64

Source: CCIL

the relatively safe inter-bank call market. It was a win-win situation as the borrowing banks got funds at a discount while the lending Co-operative Banks got a spread over the policy rate and the MIBOR.

Reporting of OTC deals is concentrated during the second half of the day with the bulk of deals now being reported between 3:00 PM and 4:00 PM.

Share of OTC Deals in Total Call Market



Source: RBI and CCIL

Hourwise Share in Call Market Deals (%)

Year	Type	Hour1	Hour2	Hour3	Hour4	Hour5	Hour6	Hour7	Hour8	Overall Share
2013	NDS-CALL	97	76	61	40	48	58	55	64	83
	OTC	3	24	39	60	52	42	45	36	17
2014	NDS-CALL	94	79	37	39	34	30	30	82	73
	OTC	6	21	63	61	66	70	70	18	27
2015	NDS-CALL	92	68	56	49	29	13	27	83	65
	OTC	8	32	44	51	71	87	73	17	35
2016	NDS-CALL	95	83	71	65	62	31	18	77	68
	OTC	5	17	29	35	38	69	82	23	32

Source: CCIL. Based on OTC deals reported on NDS-CALL.

Hourwise Break-up of Reported Deals (%)

Year	Hour1	Hour2	Hour3	Hour4	Hour5	Hour6	Hour7	Hour8
2013	9.23	4.50	4.99	10.99	6.40	5.48	15.71	42.71
2014	7.19	2.47	10.43	7.99	9.55	20.59	23.79	18.01
2015	6.10	2.50	1.35	3.64	12.46	39.24	22.21	12.50
2016	4.91	3.17	2.49	3.13	4.06	16.98	44.40	20.85

Source: CCIL. Based on OTC deals reported on NDS-CALL.

The rates in the call market nowadays decline over the day as RBI's liquidity operations have helped considerably in smoothening liquidity demand leading to softening of rates towards day-end. The overall rates are pulled down majorly by the deals in the OTC segment. On an average there is a fall of 25 bps between the rates in the first hour and the last hour of trading in the call market. The decline is sharper at 32 bps in the OTC segment. The gap between the electronic call market and OTC trades also increases gradually during the day from a gap of 3 bps in the first hour to 12 bps by the last hour, despite the information on call rates being available on the CCIL website. The gap has increased in 2016.

Rate Difference (bps)

Year	CALL First Hour - CALL Last Hour	NDS-CALL First Hour - NDS-CALL Last Hour	OTC First Hour-LastHour	NDS-CALL - WACR	OTC - WACR
2013	23	16	33	5	-21
2014	31	31	31	8	-21
2015	27	27	33	8	-14
2016	20	17	32	8	-15
Average	25	23	32	7	-18

Source: CCIL. Based on OTC deals reported on NDS-CALL.

OTC rates are generally higher at the start of trading activity and then continue to decline throughout the day especially during the second half as the OTC deals by Co-operative Banks are reported to the NDS-CALL system. Overall the rates in the OTC segment are much lower than the rates in the NDS-CALL segment. Rates on the NDS-CALL platform were on an average around 25 bps higher than the rates in the OTC segment.

Conclusion

The past decade has seen significant decline in the volatility in the uncollateralized call market as a result of the various institutional changes accompanied by fine tuning in the operating procedures of RBI's monetary policy. Elimination of asymmetric information is one of the biggest benefits to the market from NDS-CALL. However, the reverse shift to negotiated deals done over the counter poses a rising risk in the call market. The rise of the OTC segment with its high degree of concentration especially on the borrowing side poses a systemic risk as the failure of one big borrower can result in freezing up of funds deployed by small players which can be further transmitted across the entire system. Hence, this segment requires further attention from the regulatory perspective.