

Drivers of CD Issuances: An Empirical Assessment

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In the recent period, banks have been relying more on certificates of deposit (CDs) issuances, with credit growth outpacing the deposits growth. The CDs have been majorly issued by public sector banks in the recent years while foreign banks have limited presence in the CD market. Post-covid, mutual funds have increasingly invested in CDs to further reinforce their dominant share, with a concomitant decline in other investors such as banks, financial institutions, and corporates. This article, using autoregressive distributed lag (ARDL) model, found that higher credit growth along with tight system liquidity encourages CD issuances, while increase in market volatility decreases CD issuances.

Introduction

In the financial system money market is the fulcrum of monetary policy operations conducted by the central bank. It provides equilibrium mechanism for short term demand and supply of funds and enables price discovery. Money market instruments like treasury bills and commercial papers enable the government and corporates, respectively, to meet their short-term funding requirements, while certificates of deposits (CDs) allow banks to access a cheaper source of funds than borrowing in the interbank market (Darpeix, 2022).

CD is a negotiable, unsecured money market instrument issued by banks as a promissory note against funds deposited for a maturity period up to one year.¹ CDs being bearer documents are readily negotiated and are attractive for both – the issuer banks and investors. Banks benefit from the specified maturity of deposit while investors are attracted to higher returns, short maturity and ready liquidity in the secondary market (Faniband, 2020). CDs act as an alternate source of short-term funding to complement other traditional funding sources for commercial banks, giving them liquidity and solvency support. Banks can use CDs to comply with their reserve management, especially during periods of liquidity tightness, such as the imposition of incremental cash reserve ratio (CRR) in 2023 (RBI, 2023). Furthermore, CDs are considered as safe instruments; as a result, the returns on CDs are less attractive vis-à-vis corporate bonds (Puri, 2012). As CDs have fixed tenor, banks can better manage their cash flows and plan for future banking activities.

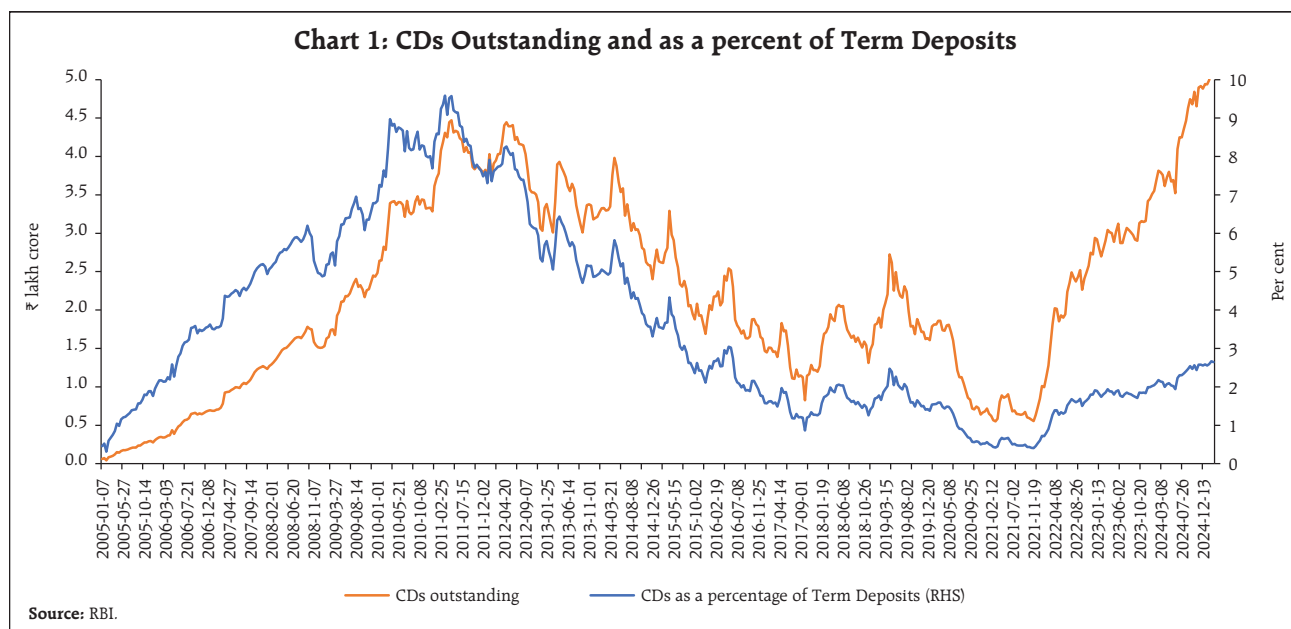
Banks find it attractive to raise funds through CDs at the beginning of interest rate upcycle, locking lower interest rates for CDs up to a year as well as meeting liquidity requirements. The CD issuances gained momentum in post-covid period with the hike in policy rates and shift in monetary policy stance at the time of robust credit growth (Chart 1). During Q4:2024-25, CD issuances had reached an all-time high of ₹3.70 lakh crore, in the backdrop of higher credit demand coupled with deficit liquidity² and subdued deposits' growth. Similarly, earlier in 2013, CD issuances had increased to a 15-year high on the back of higher

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¹ CDs can also be issued by all India financial institutions (AIFIs) for 1 to 3 years, are not considered in the article.

² Liquidity here is RBI's net liquidity adjustment facility (LAF) position. If banks borrow more than lend back, it indicates liquidity deficit.

³ https://www.business-standard.com/article/finance/cd-issuances-hit-15-year-high-106031001082_1.html



credit growth³ while, deposit growth was lagging behind the credit growth. This raises an important question whether banks are substituting traditional deposits with CDs in the scenario of deposit growth trailing credit growth. If so, what could be the reasons as banks may sometimes have to pay higher interest rates for CD issuance than traditional deposits, which may be another policy question to address.

In terms of rates, CDs have to compete with other similar money market instruments such as commercial papers (CPs), treasury bills (T-bills), and non-convertible debentures (NCDs). Therefore, understanding their issuance, investor profile and the weighted average effective interest rate (WAEIR) helps in gauging the market microstructure of CDs coupled with available system liquidity and funding requirements of the banking system. Further, CD rates can provide insights into the future interest rate expectations by banks as well as the prevailing liquidity conditions. There is a dearth of studies on the dynamics of CD market both globally as well as in the Indian context. An initial study by Cohan (1973) on the determinants of CD market in the US shows

that supply of CDs is the response to the anticipated strength of loan demand in the economy. During the global financial crisis (GFC), investors turned to CDs indicating that CDs are a safer investment option during crisis period (Aquilina *et al.*, 2023). Prevailing liquidity conditions and investors' appetite in the market were found to be the major factors impacting CD issuance in the European markets (Darpeix, 2022). Therefore, CD market could also provide a barometer of the credit demand-supply dynamics of the economy. Against this backdrop, the article examines market microstructure of CDs in India, including issuers profile and investor profile, and assesses the potential drivers of the CD issuances using transaction level data.

The article is divided into six sections. Section II provides an overview of the CD market and cross-country experience. Section III analyses CD issuance, tenors and rates, investor profiles and credit ratings. Section IV discusses potential factors impacting CD issuance. Section V empirically examines determinants of CD issuance volume using the autoregressive distributed lag (ARDL) approach and

market volatility (VIX), liquidity conditions, returns on equity, and banks credit to deposit ratio uses as explanatory variables. Section VI concludes the article with overall findings.

II. CD Market: Some Preliminaries

II.1 Cross-Country Experience

The development of CDs began in the US by New York banks in mid-1960s as a result of rising credit demand and dampened deposit growth during the economic growth cycle (McKinney, 1967). In 1978, the US Federal Reserve introduced 'money market certificate of deposit' to prevent rising interest rates from adversely affecting the flow of savings into financial institutions (Winningham, 1979). This was closely associated with the US interest rate liberalisation process (Liu, 2018). In the US, CDs are considered as special type of deposit account with a bank or financial institution with tenor up to five years and can be bought through federally insured banks where the funds are insured up to USD 250,000.⁴ During the global financial crisis (GFC), many American investors turned to CDs as it is a safer investment in volatile market conditions.⁵ Globally, CDs are rarely traded in the secondary markets and investors tend to hold them till maturity (Aquilina *et al.*, 2023).

In the Euro area, banks account for around 70 per cent of outstanding CD issuance, with the French banks being most active. CDs are mainly issued in domestic currency; however, it can be issued in other currencies in the US and UK market. In contrast to the advanced countries, in China the CD market is nascent and grew after the Chinese central bank liberalised interest rates in 2015. Liu (2018) found that growth in the CD improved monetary policy

transmission in China; however, it also resulted in maturity mismatch, increasing leverage and decline in credit ratings of banks, thereby increasing financial stability concerns.

The cross-country experience shows that banks or deposit taking institutions are the major issuers of CDs while mutual funds, pension funds and insurance companies including cash rich non-financial corporations are the investors in CDs (FSB, 2024). Generally, issuance of CD is concomitant with the increase in policy rates, as banks scout for money market instruments during the policy tightening phase. Although CD markets function well in normal times, they are susceptible to illiquidity in times of stress. Generally, CDs are held till maturity given the short-term nature of these instruments, which results in very limited secondary market activity in normal times. Further, the primary issuance market, where most activity takes place, is intermediated by a small number of core dealers that typically act as a single point of market entry. The limited number of intermediaries means that they may not be able to respond to spikes in liquidity demand in times of stress (FSB, 2024).

Unlike other money market instruments, there is no definitive source of data that compiles and reports global CD issuances. Countries have varying reporting requirements and methodologies for tracking CD market, which makes it difficult to get a concise idea about the CD market. A Report based on survey data, estimates global CD market size USD 1 trillion in 2023 and it is projected to reach USD 1.5 trillion in 2032.⁶ Another report projected to reach CD market to USD 2.3 trillion by 2033 from USD 1.5 trillion in 2024.⁷ Whatsoever the estimates are, it still reflects smaller

⁴ <https://www.investor.gov/introduction-investing/investing-basics/investment-products/certificates-deposit-cds>

⁵ <https://www.sec.gov/reportspubs/investor-publications/investorpubscertific>

⁶ <https://dataintel.com/report/global-certificate-of-deposit-market>

⁷ <https://www.verifiedmarketreports.com/product/certificate-of-deposit-market>

share in the outstanding USD 128 trillion global debt market as on August 2020, estimated by international capital market association (ICMA). Lack of public data across CD markets presents a challenge when it comes to monitoring these markets, and thus may discourage broader investor participation (FSB, 2024).

II.2 Indian Experience

In India, although CDs are mentioned in the Reserve Bank of India Act 1934, due to the lack of an active secondary market, administered interest rates and possible danger of fictitious transactions, CDs were not issued until 1989. The Vaghul Committee on money market reforms recommended issuances of CDs in 1987 (RBI, 1987). Major milestones in the development of CD market in India is given in Annex table A2. Since their inception, CDs are issued by banks for up to 1 year, while the non-bank financial institutions can issue CDs for a duration of 1 to 3 years. Details about the CD product, eligible issuers and investors along with regulatory requirement are given in Annex Table A1.

Typically, CD issuances go up when there is a boom in credit demand with lower growth in bank deposits. During Covid, the CD market had become dormant due to limited requirement for funds by banks and surplus liquidity conditions. Recently, there has been an increase in CD issuances and the CD rates *i.e.*, WAEIR. CD issuance, which was muted during the Covid period (April 2020-November 2021), jumped to ₹ 68,973 crore in the fortnight ending March 22, 2024, from a low of ₹386 crore on May 8, 2020 (Chart 2a). As Covid-related uncertainties waned, hike in policy rates and shift in monetary policy stance at the time of robust credit growth led to the rise in outstanding CDs. On the back of Reserve Bank's introduction of 10 per cent incremental CRR (I-CRR) from May 19, 2023, to mop

up the excess liquidity emanating from withdrawal of ₹2000 denominated currency, CD issuances increased. Further, quarter-end effects of advance tax payments and goods and services tax (GST) outflows, coupled with lesser government spending leading to liquidity tightening, result in higher CD issuance by banks. Along with these factors, slowdown in CASA deposit growth for banks as bank depositors shift to alternate assets, has resulted in increased reliance on CDs by banks.⁸

It is found that banking liquidity and CD issuance were negatively correlated (-0.62) during the study period. Therefore, CD issuances spike in March as Banks use CDs as a way to manage liquidity needs arising as a result of tight liquidity conditions during the year-end. Since April 2022, CD issuance has been increasing and reached ₹1.17 lakh crore in March 2025. Outstanding CD issuances increased to all time high of ₹11.75 lakh crore during 2024-25 (Chart 2a and b).

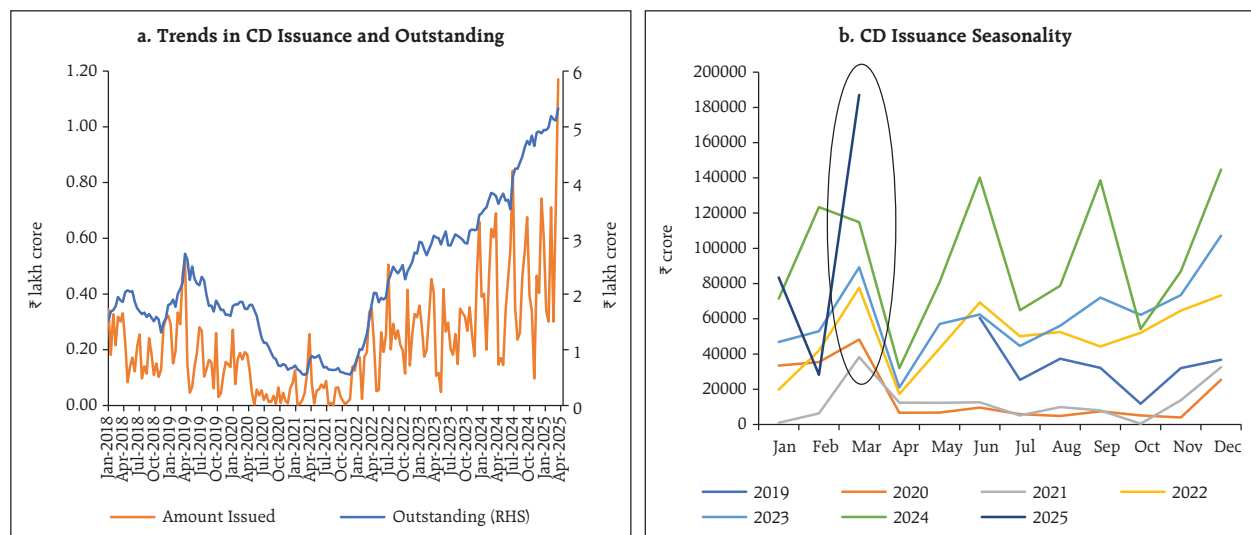
III. CD Issuers and Investors

Among the CD issuers, public sector banks (PSBs) and private sector banks (PVBs) are the dominant players, while CD issuance by foreign banks (FBs) and small finance banks (SFBs) is muted and intermittent. The share of PVBs has declined from 85 per cent in January 2022 to 30 per cent in December 2024, concomitantly the share of PSBs has increased from 6 per cent to 69 per cent during the period. This contrasts with the general belief that issuance of CDs is dominated by PVBs to complement their current and savings account (CASA) deposits (Chart 3).

Though CDs can be issued for a period up to

⁸ <https://economictimes.indiatimes.com/industry/banking/finance/banking/more-savers-ditch-bank-deposits-to-flirt-with-equity/articleshow/107923540.cms>

Chart 2: Trends in CD Issuance

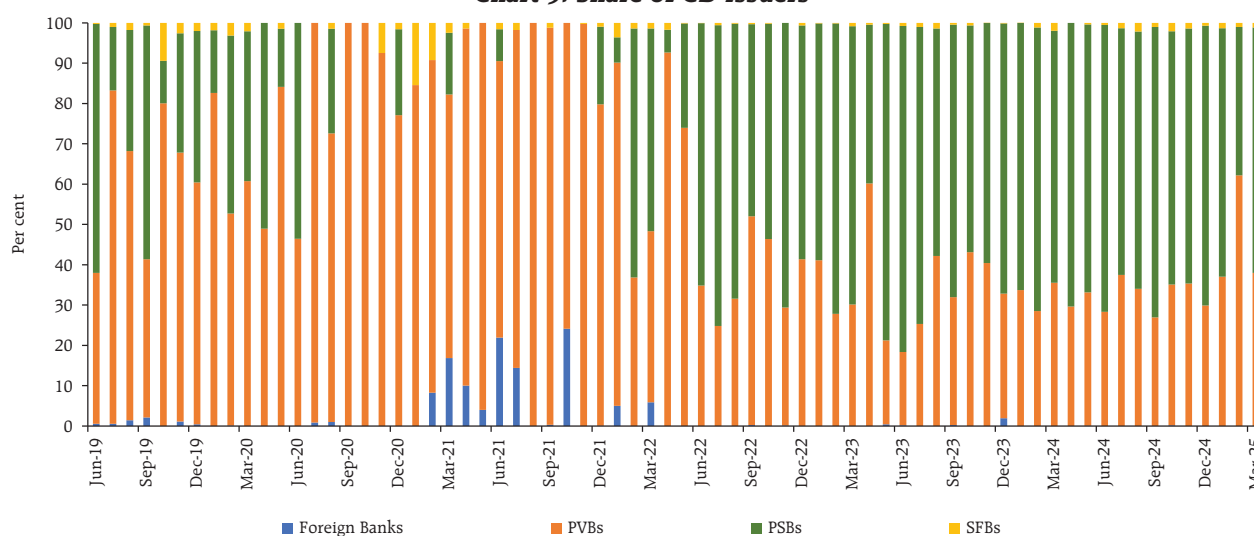


Sources: F-Trac and authors' calculations.

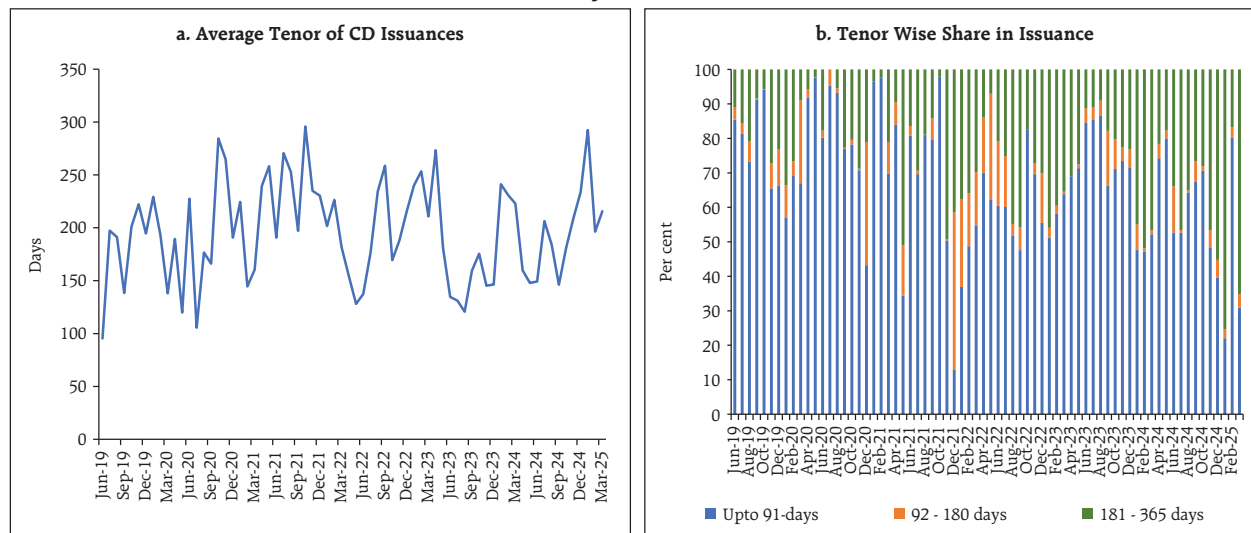
365 days, the average tenor depends on the liquidity needs of banks and expectations of the future interest rates. During interest rate hike cycle, banks benefit by locking longer tenor CDs, while in easing cycle banks usually have no benefit in issuing longer tenor CDs unless there is high credit demand. The average tenor of CDs witnessed increasing trend from 95 days in June 2019 to 296 days in October

2021, which coincides around the start and peak of interest rate easing cycle; and thereafter, the average tenor has decreased to 128 days in May 2022 when Reserve Bank raised policy rate. In September 2024 the average tenor of CD issuances was lower at 146 days indicating that banks were raising CDs for short-term funding and expecting decline in interest rates (Chart 4a).

Chart 3: Share of CD Issuers



Sources: F-Trac and Authors' calculations.

Chart 4: Maturity Profile of CD Issuance

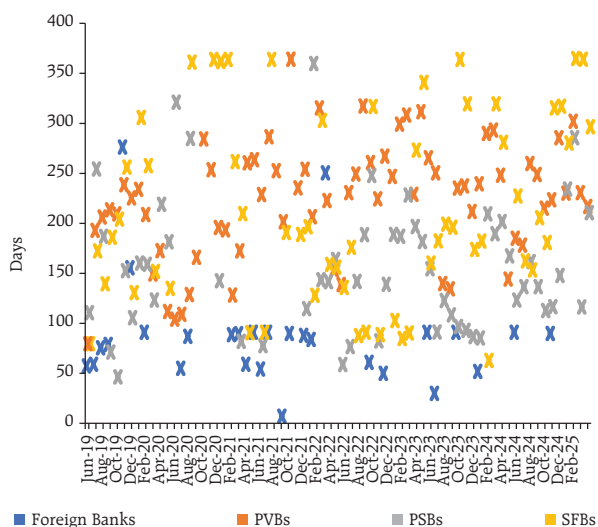
Sources: F-Trac and Authors' calculations.

Amongst the various tenors, the share of CDs issued up to 91 days and between 180-365 days dominate the CD issuance, thus making CDs either an instrument of short-term liquidity management or an instrument to lock short-term rates for longer period (up to 1 year), which may be beneficial for banks during the interest rate upcycle. This is further corroborated by the fact that the share of CDs between 180-365 days has declined since April 2023, when RBI paused interest rate hikes. Since then, the share of CDs issued up to 91 days dominate the CDs issuance, indicating the use of CDs as instrument to meet short-term liquidity needs (Chart 4b).

As CDs are unsecured debt instruments, the average tenor of the CD issuance and WAEIR provide insights into short-term funding dynamics among the four broad categories of commercial banks. The average tenor for PVBs is higher at 222 days, *vis-à-vis* both PSBs as well as SFBs at 155 and 215 days, respectively. Longer tenor of CDs issuance by PVBs imply that they raise funds to not just meet the short-term funding requirements but also for locking in lower interest rates. PSBs have an average tenor of

155 days, indicating use of CDs mostly as instruments for their short-term funding needs (Charts 5).

The CD WAEIR increased steeply after February 2022 alongside increase in policy rate, signalling deficit liquidity conditions. A comparison of WAEIR of different categories of issuing banks shows that on an average, PSBs had lower WAEIR than others. However, this spread in the WAEIR among the banks

Chart 5: Issuer-wise Tenor

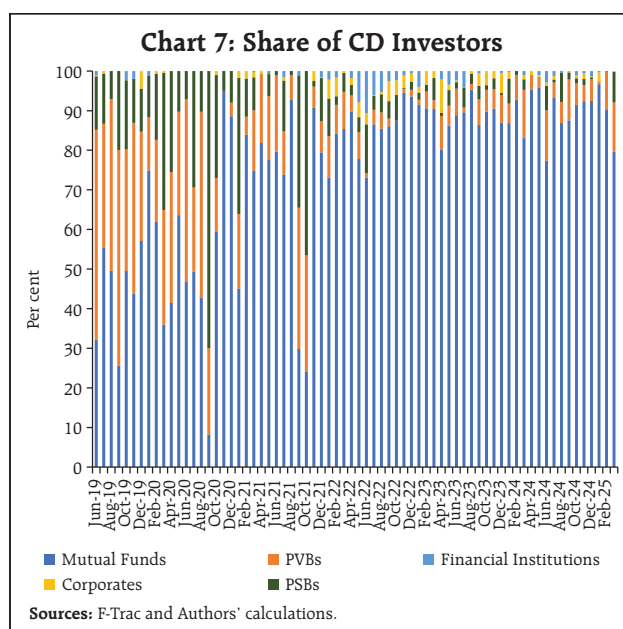
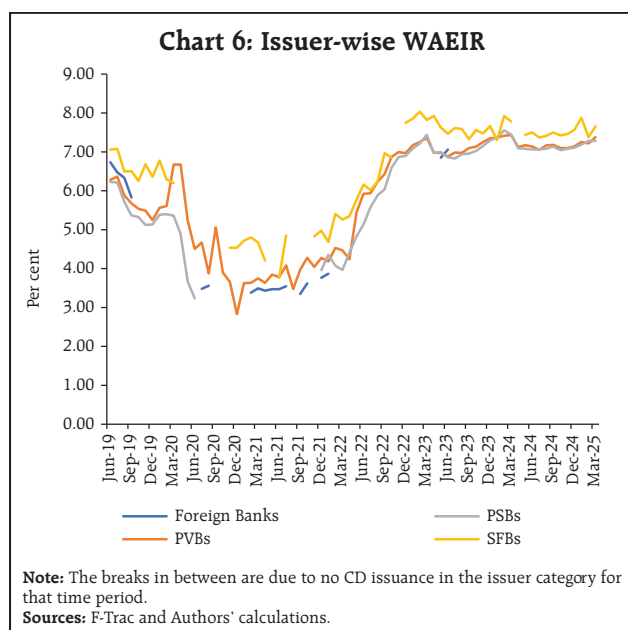
Sources: F-Trac and Authors' calculations.

narrowed since July 2022. For SFBs, the WAEIR is usually higher than others, reflecting higher risk premia (Chart 6).

III.1 Who are the CD Investors?

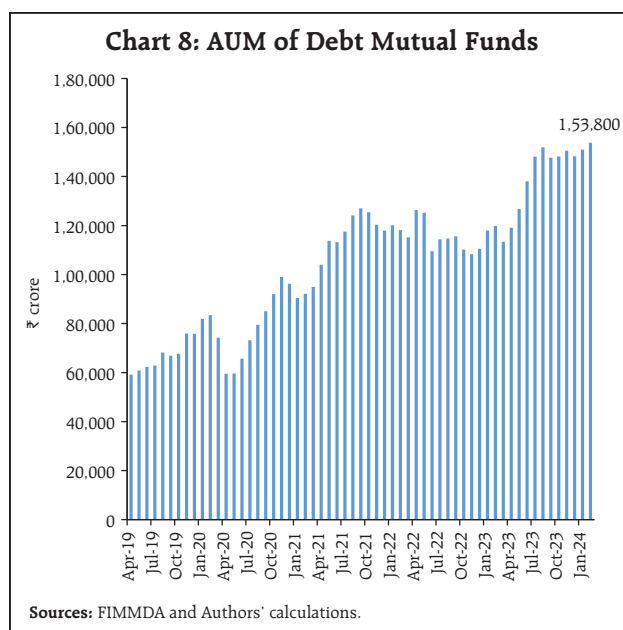
Globally, it has been found that money market mutual funds are the major investors in the CD market (Aquilina *et al.*, 2023). In the Indian context also, mutual funds remain the dominant investors, with an average share of 85 per cent since November 2021. Among other investors, PVBs and PSBs have an average share of 11 and 6 per cent, respectively, while corporates have a marginal share (Chart 7).

As debt mutual funds are mandated to invest in shorter duration instruments they are always on the lookout for investment opportunities in the CD market. Thus, an increase in assets under management (AUM) of debt MFs further might have boosted the MFs' share in the total investment in CDs during the post-covid period. The AUM of debt MFs registered a compounded annual growth rate of 12.2 per cent from March 2022 to September 2022 (Gupta *et al.*, 2022) [Chart 8].



III.2 Credit Rating Across CD Issuance

The credit risk of the underlying assets held by the issuing banks is reflected in its credit rating. If a bank is less creditworthy, it has to pay higher rate for CD issuance. This is in line with global experience (Johnson *et al.* 2008). However, CD market is considered to be less efficient and as CD rates are negotiated bilaterally, market stakeholders



and bank specific characteristics can influence CD rates. Almost all the CD issuances are A1+ rated while among the rating agencies, CRISIL dominates with 55 per cent share (Chart 9).

IV. CD Issuance in India: Trends and Correlates

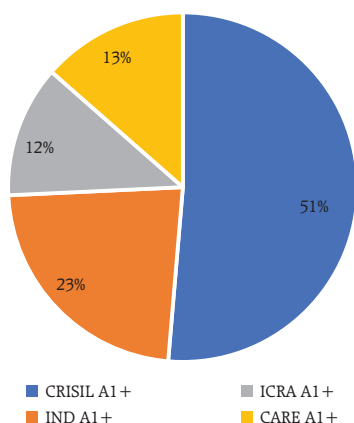
Allen (1971) observed that CD issuance is sensitive to interest rates of other money market instruments, thus CDs' outstanding volume is dependent on the ability of CDs to compete with other money market instruments and banks' funding requirements. A positive correlation between CD issuance and WAEIR with the weighted average call rate (WACR) is found in the Indian CD market. The WAEIR of CD issuance follows the path of policy rate cycle. For instance, it increased consistently between the fortnight ending May 6, 2022 to December 31, 2023, from 4.2 per cent to 7.5 per cent, in line with the increase in policy repo rate.

The 3-month CDs traded marginally above the repo rate before the onset of COVID pandemic, however, it was below the repo rate during the surplus liquidity phase and mostly traded around the

repo rate till the first hike on May 4, 2022; thereafter, remained above the repo rate, which points to tight liquidity conditions in accordance with RBI's withdrawal of accommodation stance. Consequent to the rate hike, liquidity conditions tightened whereby liquidity absorption declined from average of ₹6.5 lakh crore in January 2022 to ₹4,547 crore in February 2023, further to an injection of ₹1.17 lakh crore in December 2023 (Chart 10).

Macroeconomic shocks can affect banks' risk premia on CDs *i.e.*, spread between the WAEIR of CDs and the risk free rate (Kishan and Opiela, 2015) as it can be seen that during the US regional banking crisis in March 2023, The CD WAEIR spiked. In India, the spread between WAEIR of CDs and repo rate has decreased since the pause in policy rate hikes in April 2023. The narrowing of spread between CD issuances of various tenors implies that the compensation for term premia is declining in the CD market, following a pattern similar to the G-sec market. The spread of 3-month CDs over 3-month T-Bill has moved in sync with the liquidity conditions, remaining broadly

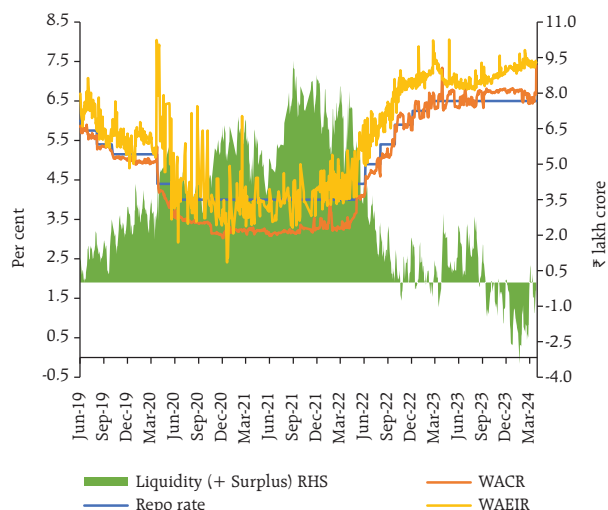
Chart 9: CD Issuance - Credit Ratings



Note: CRISIL (Credit Rating Information Services of India Limited), ICRA (Investment Information and Credit Rating Agency of India Limited), CARE (Credit Analysis and Research Limited) and IND (India Ratings) are rating agencies, while A1+ is a rating indicates very high degree of safety for timely repayment.

Sources: F-Trac and Authors' calculations.

Chart 10: Liquidity and Key Rates

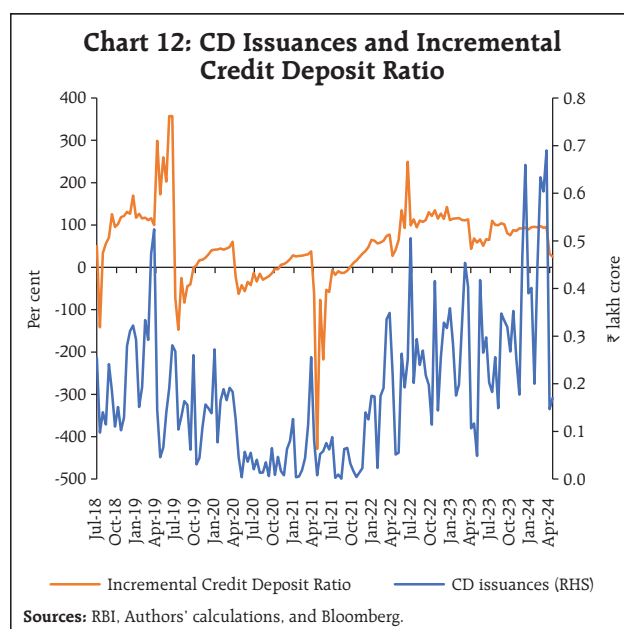
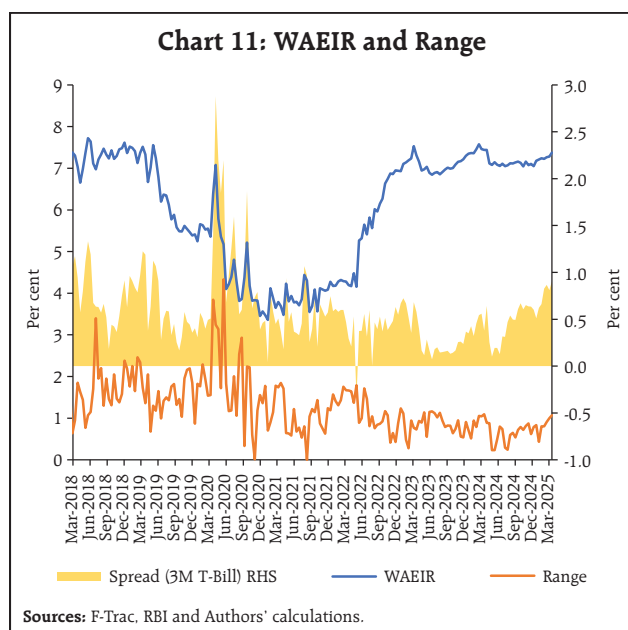


Sources: F-Trac, RBI and Authors' calculations. **Note:** liquidity is Repo + MSF - SDF - Reverse Repo.

range bound during the period. The spread was less than 40 basis points (bps) in December 2021 and increased thereafter to 100 bps around March 2023. The range between the minimum and maximum rate of CD issuance on fortnightly basis reflects the heterogeneity among the issuers as well as future interest rate expectations and liquidity needs of market participants (Chart 11).

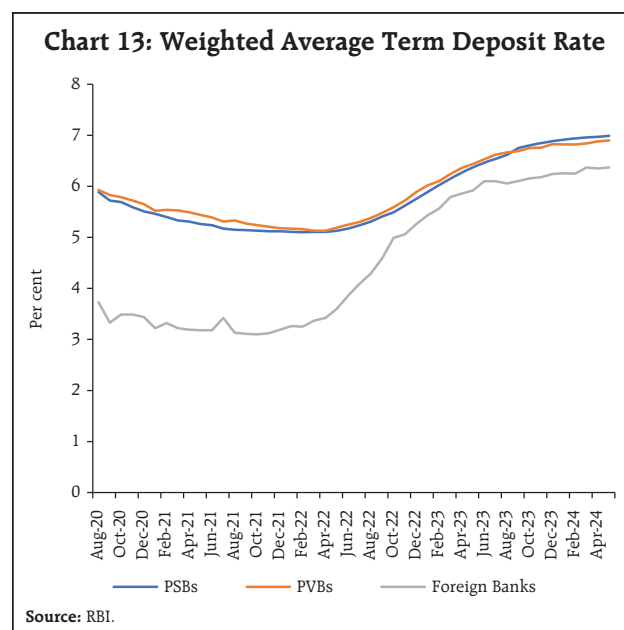
CDs can also act as a substitute to traditional deposits, especially during stressed liquidity conditions (Cohan, 1973). CDs and shorter tenor deposits are strong substitutes for one another and banks tend to prefer CDs over deposits as the latter are more sensitive to rates than the former (Humphrey 1979). A positive relationship between incremental credit deposit (ICD) ratio and CD issuances during the fortnight may exist as higher credit offtake compared to deposits could lead to higher issuance of CDs to meet the liquidity requirement of banks (Chart 12).

Further, robust CD issuances during Q4:2023-24 may be due to sustained increase in credit growth along with trailed deposit growth because



of moderate increase in deposits rates during the period. The weighted average term deposit rate (WATDR) of PSBs, PVBs and Foreign banks on outstanding deposits increased by 188 bps, 177 bps and 295 bps, respectively, during April 2022 to May 2024 (RBI, 2024) [Chart 13].

During highly uncertain market conditions, it is expected that CD issuance could be less due to muted



credit demand by industry. This limits the need for banks to issue CDs. Further, during heightened volatility period, some investors may shift towards safer assets, such as T-bills. The India volatility index (VIX), being an indicator of uncertainty in the market, is a market fear gauge, and has negative correlation with CD issuance (Chart 14).

V. Empirical Analysis

CD issuances tend to be influenced by a number of factors as discussed above (section IV). In order to further understand the contribution of various factors towards growth/decline in CD issuances over time, a regression model is estimated using fortnightly data (July 2018–November 2023).

To understand the factors driving CD issuance, the following equation is estimated:

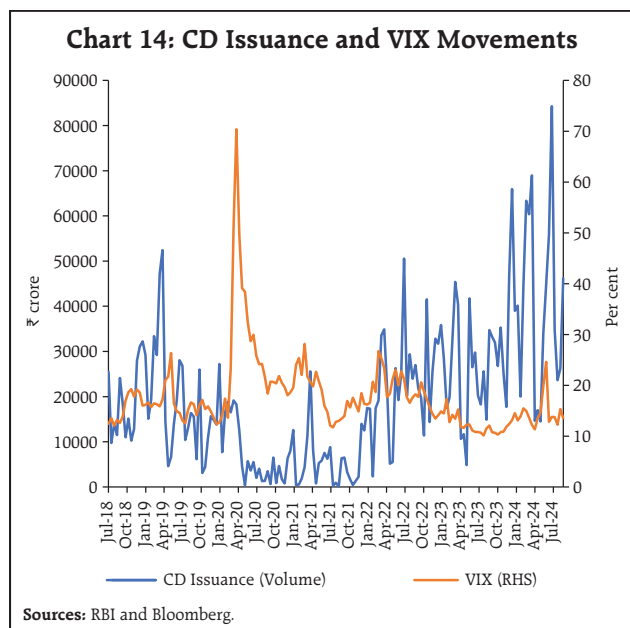
$$\Delta CD_t = \psi(CD_{t-1} - \beta x_t) + \sum_{i=1}^{p-1} \alpha_i \Delta CD_{t-i} + \sum_{j=0}^{q-1} \delta_j \Delta x_{t-j} + \xi_t \quad (1)$$

In the estimated model, dependent variable CD_t depicts fortnightly CD issuances which is represented by the natural logarithm of seasonally adjusted CD issuances during a fortnight. ψ is the error correction term. The independent variable X_t includes market

volatility index (VIX) which measures the uncertainty in the markets, $Sensx_return$ as a proxy of equity returns, CD_RATE_CH as a measure of variation in CD rate (WAEIR), ICD_ratio for how much new deposits are being utilised for lending, LAF_CH as a measure of variation in liquidity over a fortnight and OIS_CH as a measure of variation in OIS rates. The variable description and descriptive statistics are presented in Annex Tables A3 and A5, respectively.

CD rate change (CD_RATE_CH) indicates fortnightly variation in the rates (WAEIR) at which CDs are issued. The relationship of WAEIR with CD issuances depends on the RBI policy cycle, credit growth and availability of other short term deposit instruments among others. When CD issuance act as a substitute to the deposits (short term up to 1 year) especially when credit demand is soaring, and deposit growth is lagging behind an increase in CD rates (WAEIR) should lead to a decline in CD issuances and vice versa. Incremental Credit Deposit ratio (ICD_ratio) indicates the fortnightly change in credit deposit ratio; therefore, a positive relationship may exist as higher credit offtake relative to deposits could lead to higher issuance of CDs to meet the increasing reserve requirements.

The liquidity adjustment facility change (LAF_CH) indicates the variation in banking liquidity during the fortnight *vis-à-vis* previous fortnight. While a positive value implies increase in surplus liquidity, a negative value indicates decline in system liquidity during the fortnight. A period of liquidity shortage encourages banks to explore alternative avenues to raise the funds. Thus, CD issuances tend to increase with the decline in liquidity and decrease with the increase in surplus liquidity. It is therefore expected that CD issuances, in the long run, are negatively related to system liquidity measure, LAF_CH variable in the model. A dummy for liquidity tightness has also been taken, where 1 indicates period



when RBI pivoted monetary policy stance towards withdrawal of accommodation post pandemic, otherwise zero.

Interest rate expectations impact money market instruments' behaviour. For the CD issuance, increase in market expectation of interest rates could lead to increase in CD issuance and vice versa. The variable overnight indexed swap (OIS_CH), in our model, indicates the variation in OIS rates over a fortnight. While a positive value indicates increase in OIS rate, a negative value implies a decline in the rate over the fortnight. The increase in OIS rates reflects expectations of higher interest rates and lower credit growth, could lead to decline in CD issuances.

In time series econometrics, divergence from mean over time implies non-stationarity and it is considered as a violation of assumption of the classical linear regression estimation as it may lead to misleading or spurious regression. The Augmented Dicky Fuller (ADF) tests for stationarity of selected variables depict a mix of $I(0)$ and $I(1)$. In order to measure the predictive power of the independent variables, a Granger causality test (Granger, 1969) is applied (Annex Table A4). The results reconfirm that liquidity and higher credit growth relative to deposits growth can predict the future volume of CD issuances (Annex Table A6). Further as the F-statistic establishes a single long run relationship, the ARDL technique is appropriate for estimation (Annex Table A7).

The cointegration technique is a powerful way of detecting the presence of steady state equilibrium between non-stationary variables. As per Pesaran *et al.* (2001), the autoregressive distributed lag (ARDL) cointegration technique can be used in determining the long run relationship between series with different order of integration like, $I(0)$ and $I(1)$ but not $I(2)$. The coefficient of error correction term

(ECT) associated with the ARDL model reflects the speed of adjustment to long-run path following a short run deviation. If the F-statistics (Wald test) establishes that there is a single long run relationship and the sample data size is small ($n \leq 30$) or finite, the ARDL error correction representation becomes relatively more efficient. However, limitation of the ARDL approach is that when there are multiple long-run relationships, the model cannot be applied.

As per the estimation results in the short run, CD issuances are negatively impacted by increase in surplus liquidity. On the other hand, withdrawal of accommodation (DUMMY) impacted CD issuances positively, which is indicative of the fact that CD issuances increased after the Reserve Bank shifted its monetary policy stance to withdrawal of accommodation. Among the variables that have long run impact over CD issuances include market volatility measure (VIX), incremental CD ratio, LAF variation over the fortnight and fortnightly variation in OIS rates (Table 1).

Table 1: ARDL Model Estimation Results

Variable	Coefficient	p-value
Long-Run		
Error Correction Term	-0.499***	0.000
constant	9.446***	0.000
VIX	-0.042*	0.081
Sensx_return	0.0004	0.994
CD_RATE_CH	-0.009	0.536
ICD_ratio	0.005***	0.005
LAF_CH	-0.001**	0.040
OIS_CH	-0.144***	0.006
Short-Run		
D(LAF_CH)	-0.0014***	0.000
DUMMY	0.442**	0.002
Adj-R ²	0.52	
D-W statistics	2.06	
LM-p-value	0.28	
ARCH-p-value	0.26	

Note: ***, **, * denote significance level of 1 per cent, 5 per cent, and 10 per cent, respectively.

Source: Authors' estimate.

The estimation results confirm that liquidity situation, interest rate expectation, and volatility (VIX) determine CD issuance in the long run. A positive ICD coefficient indicates increase in credit with lower deposits mobilisation prompts CD issuances. In the short run also, liquidity is found to be the major driver of CD issuances. The findings reconfirm that CD issuances are mainly driven by liquidity management and short-term funding requirements.

VI. Conclusion

CD is a money market instrument issued by banks to meet their short-term funding requirement. However, in the recent period it was in focus due to higher issuances accompanied by robust credit growth and a lagging deposit growth. It has been observed that during the covid induced liquidity surplus phase private banks were front runner in issuing the CDs; however, after February 2022 PSBs dominates the share in CD issuance. Foreign banks and relatively new SFBs have limited presence in the CD market. CD rates are relatively higher for SFBs while PSBs were able to raise CDs at relatively lower rates. Mutual funds continued to remain the major investor in CDs as higher retail participation in equity market led to higher asset allocation by mutual funds.

The empirical results depict a positive impact of withdrawal of accommodation and incremental credit deposit ratio over the volume of CD issuances during the study period. This indicates banks' inclination towards increased usage of CDs, amidst tightened liquidity conditions coupled with credit growth outpacing deposits growth. Although, CD market is largely a bilaterally negotiated market, CD issuances is found to be sensitive to current and expected rate of interest. Furthermore, during uncertainty banks tend to reduce CD issuances.

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Annex**Table A1: Certificates of Deposit: Current Specification**

Product	Negotiable, unsecured money market instrument issued as a promissory note against funds deposited.
Issuance Form	A CD shall be issued in dematerialised form through any of the depositories approved by and registered with SEBI. A CD can be issued at a discount to face value. CDs can be issued in fixed or floating rate basis.
Denomination	Minimum of ₹5 lakh and multiples of ₹5 lakh thereafter.
Secondary market	CDs can be traded over the counter (OTC), electronic trading platform (ETP) or recognised stock exchanges approved by RBI. Settlement will be T+0 or T+1. CDs shall be settled on delivery versus payment (DvP) basis through clearing corporation of any recognised stock exchange or any other platform approved by RBI.
Maturity	Minimum: 7 Days and Maximum: 1 Year from the date of issuance. Settlement on a T+1 basis.
Loan against CDs	Loan against CDs not allowed, unless specified by RBI.
Buyback of CDs	CDs buyback allowed after 7 days of the issuance. The buyback should be offered to all investors and investors shall have option to accept or reject the buyback offer.
Regulators	RBI and FIMMDA (Market Self-Regulatory Organisation - SRO).
Eligible Issuers	Scheduled commercial banks, Regional Rural Banks, Small Finance Banks and all India financial institutions (AIFIs). For AIFIs tenor should not be less than 1 year and not exceeding 3 years.
Reporting	CD details shall be reported by the issuer to trade repository, i.e., Financial Market Trade Reporting and Confirmation Platform (F-TRAC) of the CCIL. Secondary market transactions shall be reported on the F-TRAC platform by each counterparty to the transaction.
Reserve Requirement	Banks are required to maintain cash reserve ratio (CRR) and statutory liquidity ratio (SLR), on the issue price of the CDs.
Eligible Investors	All persons' resident in India.

Sources: RBI and FIMMDA.

Table A2: Development of Certificates of Deposit Market in India

Year	Major Development
1934	RBI Act 1934 mentions "certificate of Deposit" as a money market instrument
1985	First comprehensive recommendations on development of money market made by Chakraborty Committee
1987	RBI constituted a working group on the money market (Chairman: Shri N. Vaghul), recommended the feasibility of introducing CD.
1989	CDs introduced in India, can be issued by scheduled commercial banks (excluding RRBs and local area banks) Banks can account the issue price under the head of "CD issued" and show them under deposits. CD amount should be included under the section 42 returns. Minimum CD issuance size was ₹1 crore.
2002	Reduced minimum issuance size to ₹1 lakh from ₹1 crore. To impart transparency and encourage secondary market transactions, CDs to be issued only in dematerialised form.
2005	The minimum maturity period of CDs reduced from 15 days to 7 days.
2020	Small Finance Banks allowed to issue CDs
2021	Regional Rural Banks allowed to issue CDs. Banks allowed to buy-back CDs. CDs shall be issued in minimum denomination of ₹5 lakh and in multiples of ₹5 lakh thereafter.

Sources: RBI and FIMMDA.

Table A3: Description of Variables

Variable	Description	Source
CD	Natural logarithm of seasonally adjusted sum of Certificate of Deposit issuances during a fortnight.	CCIL
VIX	Market volatility index.	National Stock Exchange (NSE)
Sensex_retrn	Fortnightly return in stock market.	Bombay Stock Exchange
CD_RATE_CH	Fortnightly change in the Weighted Average Effective Interest Rate (WAEIR) for CD market.	CCIL, authors calculation
LAF_CH	Fortnightly change in liquidity available in the system.	RBI
OIS_CH	Fortnightly change in OIS rates (1 year tenor).	Bloomberg
ICD_ratio	Incremental Credit Deposit ratio during the fortnight.	RBI
Dummy	Dummy for increase in liquidity tightness (1 indicates period when RBI shifted its focus towards withdrawal of accommodation post pandemic, otherwise 0)	RBI; authors calculation

Source: Authors' estimate.

Table A4: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
ICD does not Granger Cause CD_VOL	139	6.55	0.00	Causality
CD_VOL does not Granger Cause ICD		0.13	0.88	No causality
IIP does not Granger Cause CD_VOL	139	2.11	0.13	No causality
CD_VOL does not Granger Cause IIP		0.27	0.77	No causality
LAF_S does not Granger Cause CD_VOL	139	4.91	0.01	Causality
CD_VOL does not Granger Cause LAF_S		2.08	0.13	No causality
LG_SNSX does not Granger Cause CD_VOL	139	1.71	0.18	No causality
CD_VOL does not Granger Cause LG_SNSX		0.98	0.38	No causality
MCLR does not Granger Cause CD_VOL	139	9.91	0.00	Causality
CD_VOL does not Granger Cause MCLR		6.92	0.00	Causality
OIS does not Granger Cause CD_VOL	139	1.62	0.20	No causality
CD_VOL does not Granger Cause OIS		0.34	0.71	No causality
VIX does not Granger Cause CD_VOL	139	1.62	0.20	No causality
CD_VOL does not Granger Cause VIX		0.34	0.71	No causality
WACR does not Granger Cause CD_VOL	139	8.78	0.00	Causality
CD_VOL does not Granger Cause WACR		3.27	0.04	Causality
WAEIR does not Granger Cause CD_VOL	139	7.95	0.00	Causality
CD_VOL does not Granger Cause WAEIR		2.19	0.12	No causality
BSI does not Granger Cause CD_VOL	139	2.62	0.08	Causality
CD_VOL does not Granger Cause BSI		1.94	0.15	No causality
IIP does not Granger Cause ICD	137	1.06	0.35	No causality
ICD does not Granger Cause IIP		0.37	0.69	No causality

Sources: Authors' estimate.

Table A5: Descriptive Statistics

	Ln CD Volume (seasonally adjusted)	Incremental credit deposit ratio	LAF_CH	Snsx_retrn	OIS_CH	VIX	CDR_CH
Mean	9.261	49.09	-6.38	0.38	0.04	18.27	-0.44
Max	11.842	357.47	3045	11.78	25.81	70.38	26.65
min	4.751	-428.89	-2184	-12.57	-11.16	10.13	-100
Std Deviation	1.278	88.69	968.91	3.48	3.44	7.84	11.06
Skewness	-0.99	-0.85	0.23	-0.37	2.96	3.37	-5.09
Kurtosis	4.37	9.40	3.06	5.39	25.29	19.24	49.04
Jarque-Bera	33.81	257.96	1.26	36.71	3104.81	1817.39	12876.05
Probability	0.00	0.00	0.53	0.00	0.00	0.00	0.00
Observations	140	141	140	140	140	141	139

Source: Authors' estimate.

Table A6: ADF Unit Root Test Results

Variable	t-statistic	Probability
D(Ln_cdvol_sa)	-10.366***	0.00
D(Incremental CD ratio)	-18.673***	0.00
LAF_CH	-21.340***	0.00
Snsx_retrn	-5.966***	0.00
OIS_CH	-5.93***	0.00
VIX	-4.463***	0.00
CDR_CH	-10.463**	0.00

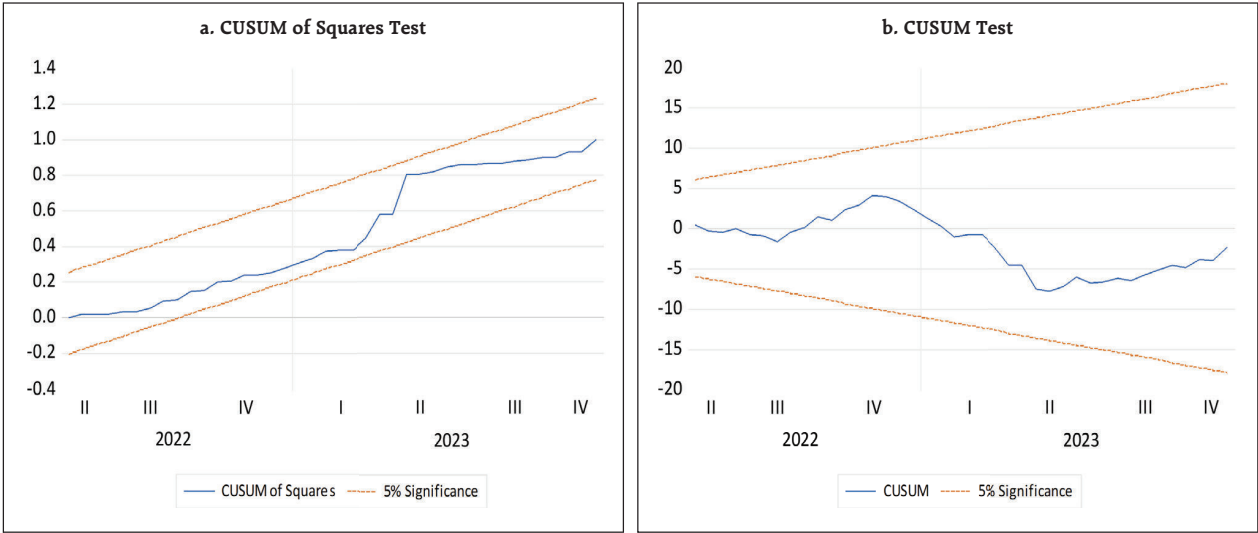
Note: *** denote significant level of 1 per cent, while** denote significance at 5 per cent confidence level.
Source: Authors' estimate.

Table A7: Bounds Test Results

F-Bounds Test	Null Hypothesis: No levels relationship			
Test Statistic	value	Signif.	I(0)	I(1)
F-statistic	4.88	10%	1.99	2.94
k	6	5%	2.27	3.28
		1%	2.88	3.99

Source: Authors' estimate.

Chart A1: Stability Tests



Source: Authors' estimate.