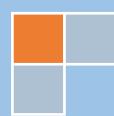


# CCIL Treasury-bill (T-bill) Index

CCIL T-bills Index aims to capture the performance of the treasury bills, which are short-term maturity securities. T-bills index is a total return index which is based on representative securities selected across five distinct maturity buckets. It comprises of the CCIL Liquidity Weight T-bill Index and CCIL Equal Weight T-bill Index.



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## **1. INTRODUCTION**

The government securities market is considered as the backbone of the fixed income securities market and is the prime funding avenue for the government. In India, the government securities market singularly dominates the transactions in the fixed income market and is thus a prime source of information on the financial market's interest rate expectations. The Indian bond market has grown exponentially in the past few years and holds the fourth position in the Asian market with respect to the outstanding government debt after Japan, China, and South Korea. As on March 31, 2018, the total outstanding government debt stood at Rs.51.86 trillion.

The central government and the state governments borrow by issuing sovereign securities and state development loans (SDLs) respectively. The central government also issues treasury bills which are securities with residual maturity of less than a year. These securities are issued in the primary market through normal auctions. The RBI conducts the auctions of T-bills through a pre-announced quarterly indicative calendar. There exists a secondary market for government securities and they are traded and reported on the Negotiated Dealing System-Order Matching (NDS-OM). As of FY 2018, T-bills accounted for about 10% of the total outright trades.

## **ABOUT CCIL**

The Clearing Corporation of India Ltd. (CCIL) was set up in 2001 to provide an institutional infrastructure for the clearing and settlement of transactions in government securities, money market instruments, foreign exchange and other related products with the objective of bringing about efficiency to the transaction settlement process, and mitigating the systemic risk emanating from settlement related problems and counter party risk. CCIL is a payment system operator, authorized by the Reserve Bank of India (RBI) under the PSS Act 2007 to provide guaranteed settlement in TREP, Securities, Forex and Rupee Derivatives market. In view of its critical importance to the Indian financial system, CCIL has been designated as a critical Financial Market Infrastructure (FMI) by the RBI and it has given CCIL the status of a Qualifying Central Counterparty (QCCP) on January 1, 2014.

CCIL offers guaranteed settlement services for government securities comprising of outright, repo and TREP markets in the money market segment. In the forex market, it offers guaranteed settlement to all interbank USD/INR forex transactions, inclusive of USD/INR forward transactions. It also offers settlement services to rupee derivative and cross currency transactions. CCIL, through its subsidiary Clearcorp Dealing Systems (India) Ltd. (Clearcorp), manages trading platforms in the Money and G-Sec market on behalf of the RBI and also owns trading platforms in the fixed income, money, forex, and derivative markets. CCIL also manages the trade repository for the interest rate, forex and credit derivatives market in India, which has enhanced the level of transparency in the markets through data dissemination and publication. CCIL's wholly owned subsidiary Legal entity Identifier India Limited (LEIL) is the Local Operating Unit (LOU) in India for issuing globally compatible Legal Entity Identifiers (LEIs) in India.

## **2. RATIONALE**

The short-term instruments have gained importance as the market participants are increasingly using these instruments for their treasury operations. In 2017-18, T-bills constituted nearly 9% of the total outright trades in the market. The increasing activity at the shorter-end of the market highlights the importance of T-bills. A T-bill index would capture the market movement in the short-term maturity segment.

CCIL is the Central Counterparty for all transactions in the Indian Government Securities market and follows the process of netting through novation to provide guaranteed settlement for all secondary market transactions. The trading information is used to compute the volume weighted average prices of all traded securities. The theoretical price of the securities is also computed using an YTM Curve model developed internally.

In order to capture the movement in the short-term maturity segment, the two indices proposed are:

1. CCIL Liquidity Weight T-bill Index: A flexible duration index which takes into account the pure liquidity aspect of the market.
2. CCIL Equal Weight T-bill Index: A fixed duration index which provides equal weightage to all residual maturity buckets.

## **3. DATA DETAILS**

- Data Source**

Trades executed and reported on the Negotiated Dealing System- Order Matching (NDS-OM) platform are considered for the T-bill index computation.

- Issuer**

T-bills of 91-day tenor, 182-day tenor and 364-day tenor issued by the Government of India are considered.

- Price Details**

Volume weighted average prices (VWAP) of T-bills are considered for the computation of the index. In case VWAP is not available for any particular maturity bucket, the model prices are used.

## 4. INDEX LOGIC

- **T-bills Inclusion Criteria**

T-bills with individual trades having volume of Rs.5 crore or more are included. The index is constructed based on five distinct sub-segments in terms of the maturity buckets.

- **Base Date and Value**

For the calculation of the CCIL T-bill Index, January 01, 2004 has been selected as a base date with a base value of 100.

- **Weighting Scheme**

The liquidity aspect is captured through the CCIL Liquidity Weight T-bill Index, where different weights are assigned to each tenor bucket. The buckets are assigned weights based on the previous year's trading volume. The weight assigned to each maturity bucket is determined as the ratio of the trading volume of the T-bills constituting the time bucket to the total trading volumes of T-bills. In case of the CCIL Equal Weight T-bill Index, equal weights are assigned to all residual maturity buckets.

- **Calculation Details**

The CCIL T-bill Index is a total return index. The index is based on five distinct sub-segments in terms of the maturity buckets – less than equal to 60 days; between 61 and 120 days; between 121 and 240 days and between 241 and 360 days, and 361 to 364 days. The last bucket has been included to represent the longer end of the maturity bucket in T-bills. The 364-day T-bills are traded vigorously on auction days and the nearest long dated T-bill traded in substantial quantity are T-bills having residual maturity of 361 days. The index takes into account the midpoint of the first 4 time buckets and a fixed point of 361 day for the last bucket. The T-bills yields/prices of 30 days, 90 days, 180 days, 300 days and 361 days of residual maturities would be used in the construction of the index. The CCIL Equal Weight T-bill Index would have duration of 192 days.

Bucket	1	2	3	4	5
Maturity (Days)	≤ 60	61 - 120	121 - 240	241 - 360	361 - 364
Mid-Point	30	90	180	300	361

### Price Computation

For the first four residual maturity buckets, the prices used in the index are volume weighted average prices of the T-bills and if trades are executed on instruments having the exact residual maturities cited above, the prices are used for the computation of the index. If the trades are not executed for the exact residual maturity in a time bucket, then linear interpolation is used to find out the appropriate trade price of the synthetic T-bill of the appropriate maturity as given above. However, the interpolation method is used when two

yield/price points are available within a particular time bucket. If two yield/price points in a time bucket are not available, then model prices/yields are considered for the synthetic T-bills of requisite maturities. For the 361-day residual maturity, interpolation/extrapolation method for extracting the price using the two nearest price/yield points is used.

### Total Return Index

The index is a total return index. Returns have two components – the investment yield for the day and market return due to change in price from previous day, and are computed bucket-wise.

$$BR_t = [(Redemption\ Price - P_t) / (P_t * Number\ of\ Days)] + [(P_t - P_{t-1}) / P_{t-1}]$$

The total return is then computed by assigning equal weights to the bucket-wise returns in case of CCIL Equal Weight T-bill Index and weights based on liquidity to the bucket-wise returns in case of the CCIL Liquidity Weight T-bill Index.

$$TR_t = \sum_{i=1}^n BR_i * LW_i$$

Where,  $BR_i$  is the bucket returns and  $LW_i$  is liquidity weight of particular bucket. In case of the equal weight index,  $LW_i$  will remain 0.2 for all buckets.

The Total Return Index as of that day is computed as:

$$I_t = I_{t-1} * (1 + TR_t)$$

where  $TR_t$  is the total return of the day  $t$  and  $I_{t-1}$  is the Index on day  $t-1$ .

### Duration

The duration of the CCIL Equal Weight T-bill Index is based on a fixed duration of 192 days. The duration of the CCIL Liquidity Weight T-bill Index is calculated as the sum of the liquidity weighted duration of the individual residual maturity buckets.

$$D = \sum_{i=1}^n D_i * LW_i$$

Where,  $D_i$  is the duration of bucket  $i$  and  $LW_i$  is the relevant weight based on liquidity of bucket  $i$ .

## **5. INDEX REBALANCING**

The CCIL Liquidity Weight T-bill Index is rebalanced at the start of a new year i.e., on first day of the calendar year.

## **6. TREATMENT OF HOLIDAYS / NON-WORKING DAYS**

The CCIL Equal Weight T-bill Index and the CCIL Liquidity Weight T-bill Index values are estimated only on working days.

## **7. INDEX RELEASES**

- The index values are released at the end of each working day.
- The index value is available on each working day on the CCIL web portal ([www.ccilindia.com](http://www.ccilindia.com))

### **TECHNICAL NOTE:**

CCIL > Research > CCIL Publications > Monthly > Research Articles > Money Market > Developing A Treasury Bills Index in Indian Market June 2005 Golaka C. Nath, Girish M Walli, Gaurav Yadav

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