# Money Markets Overview



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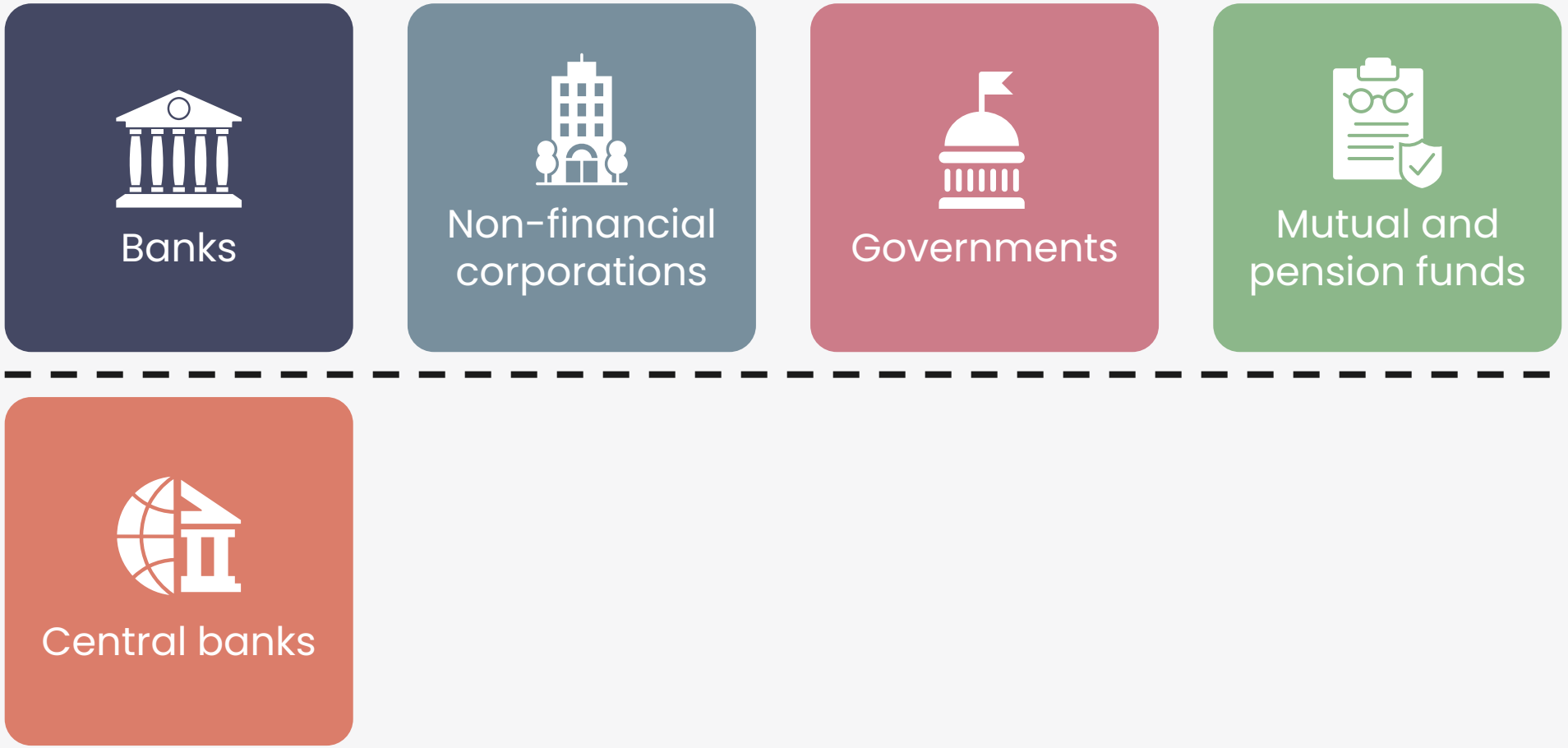
Interest rate payments are usually made at maturity of the debt instrument – simple interest rate calculations apply:

$$\text{Amount of interest} = \text{notional} * \text{interest rate} * \frac{\text{days}}{\text{basis}}$$

Example: $100M invested at 5% from 12/01/2024 to 12/02/2024:

ACT/360: $430,555.56
ACT/365: $424,657.53

# Money Market Participants



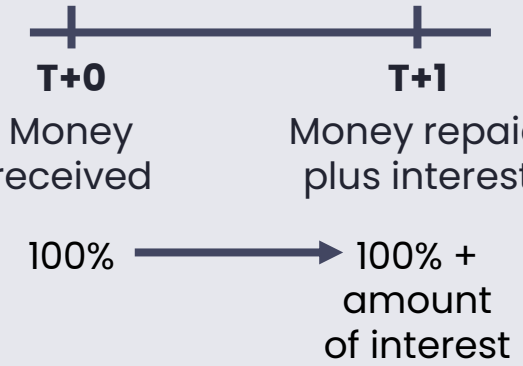
# Unsecured Money Market Cash Products

| | Deposits | Certificates of deposit (CDs) | Treasury Bills (T-Bills) | Commercial paper (CP) |
|---|---|---|---|---|
| Borrower /issuer | Banks | Banks | Governments | Corporations |
| Interest payment | Coupon instruments | Coupon instruments | Discount instruments | Usually discount instruments |
| Negotiable? | Non-negotiable | Often negotiable<br><br>Rarely traded in secondary markets | Negotiable<br><br>Relatively liquid secondary market | Negotiable<br><br>Rarely traded in secondary markets |

# Deposits and CDs

## Deposits

Mostly overnight deposits:




Term deposits (for example 3 months) exist as well.

## Certificates of Deposits (CDs)

Receipt of deposit is recognized by issuance of a certificate stating amount, maturity, interest rate paid.

If negotiable, the secondary market price of a CD is calculated as the PV of the redemption payment:

### Example:

- $100 Mio originally invested in 6 months CD (182 days) at 5%
- 34 days prior to maturity the investor is looking to sell, dealer sees the current 34-day rate for the issuer at 5.10%

$$\frac{100{,}000{,}000 * \left(1 + 5\% * \frac{182}{360}\right)}{\left(1 + 5.10\% * \frac{34}{360}\right)} = 102{,}036{,}302.92$$





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# Treasury Bills (T-Bills)

Government issued discount instruments...

... but often quoted and priced in return terms:


Discount price → 100%

**Example:**

26-Week (182 days) US Treasury Bill
Issuance price: 97.335722%

| 912797GC5<br>**182-Day T-Bill** | 5.175%<br>**last** |
|---|---|
| 5.175%<br>**bid** | 5.165%<br>**ask** |

**Quotes as of 20/11/2023. Source: Infront**

## Discount Quote

For example: US T-Bills

$$\text{Price} = \text{FV} - \left(\text{FV} * \text{discount rate} * \frac{\text{days}}{\text{basis}}\right)$$

## Yield Quote

For example: UK and German T-Bills

$$\text{Price} = \frac{\text{FV}}{1 + \text{yield} * \frac{\text{days}}{\text{basis}}}$$





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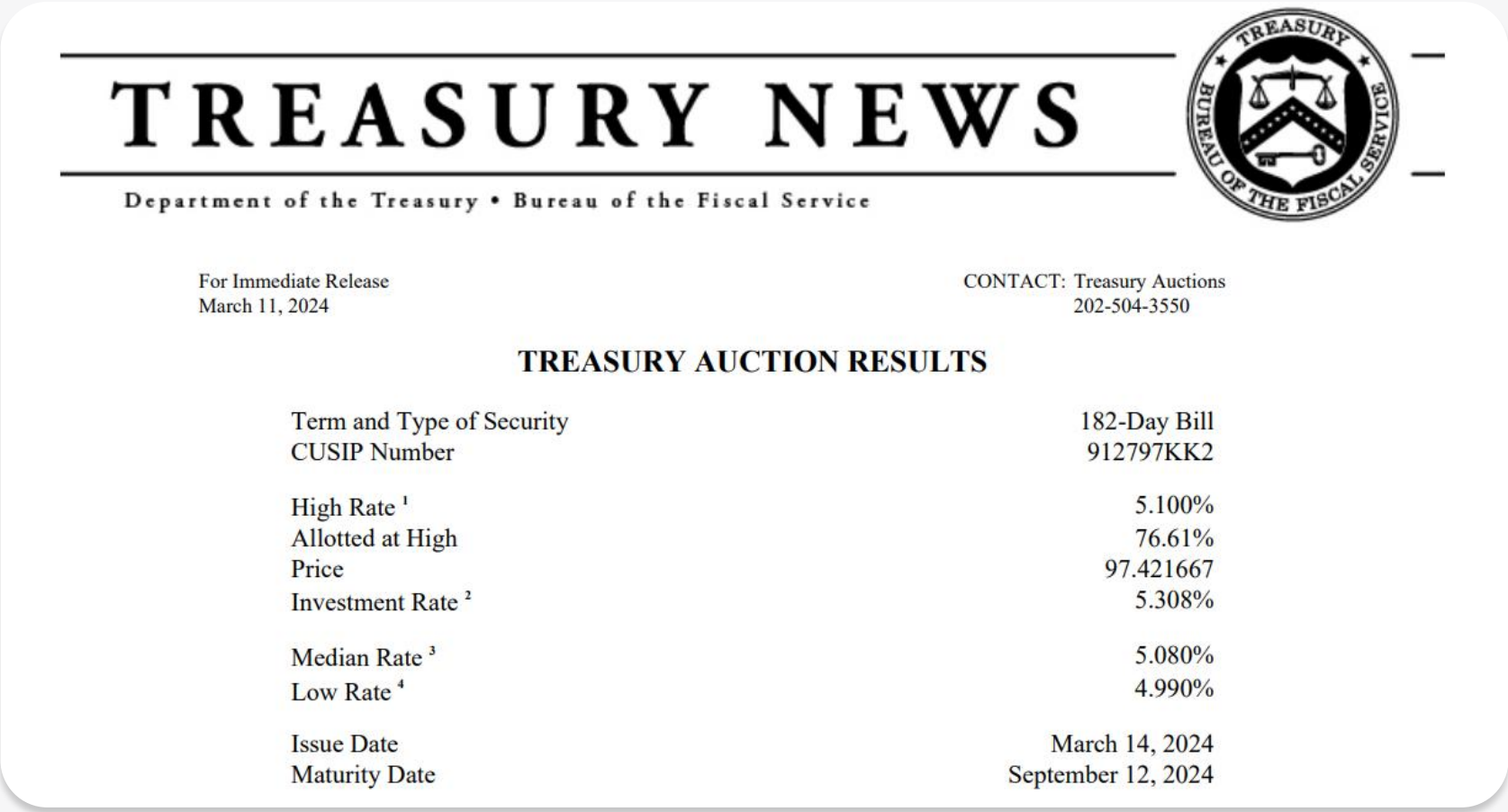
# US T-Bill Auction Results



TREASURY NEWS

Department of the Treasury • Bureau of the Fiscal Service

For Immediate Release
March 11, 2024

CONTACT: Treasury Auctions
202-504-3550

**TREASURY AUCTION RESULTS**

| | |
|---|---|
| Term and Type of Security | 182-Day Bill |
| CUSIP Number | 912797KK2 |
| High Rate [1] | 5.100% |
| Allotted at High | 76.61% |
| Price | 97.421667 |
| Investment Rate [2] | 5.308% |
| Median Rate [3] | 5.080% |
| Low Rate [4] | 4.990% |
| Issue Date | March 14, 2024 |
| Maturity Date | September 12, 2024 |

**Source**: www.treasurydirect.gov

# Repo

A repo (repurchase agreement) is the **contractual agreement** between **two counterparties** in which one effectively **borrows cash** from the other in **exchange for bonds as collateral** for a defined period at an agreed upon interest rate (the repo rate).

Most repo financing is done on an **overnight** basis and works as follows:

**Inception:**

Cash borrower (repo party) → Collateral sold and delivered → Cash provider (reverse repo party)

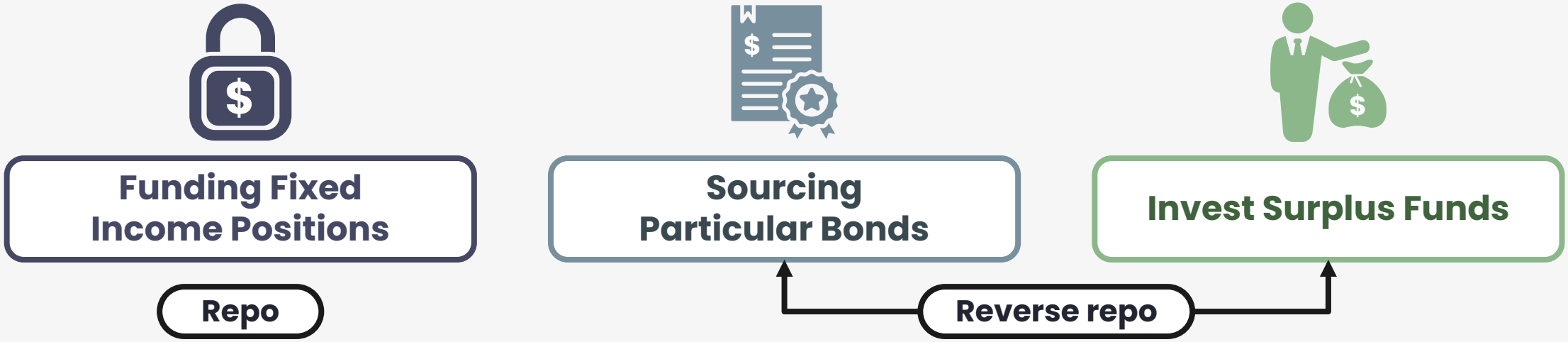
Cash provider (reverse repo party) → Price paid → Cash borrower (repo party)

**Repo maturity:**

Cash borrower (repo party) → Collateral sold and delivered at price agreed at repo inception → Cash provider (reverse repo party)

Cash provider (reverse repo party) → Price paid (usually slightly higher, reflecting interest rate cost for the cash borrowed) → Cash borrower (repo party)

# Repo and Reverse Repo Usage




The fixed income securities in a trading book will often be funded in the repo market.

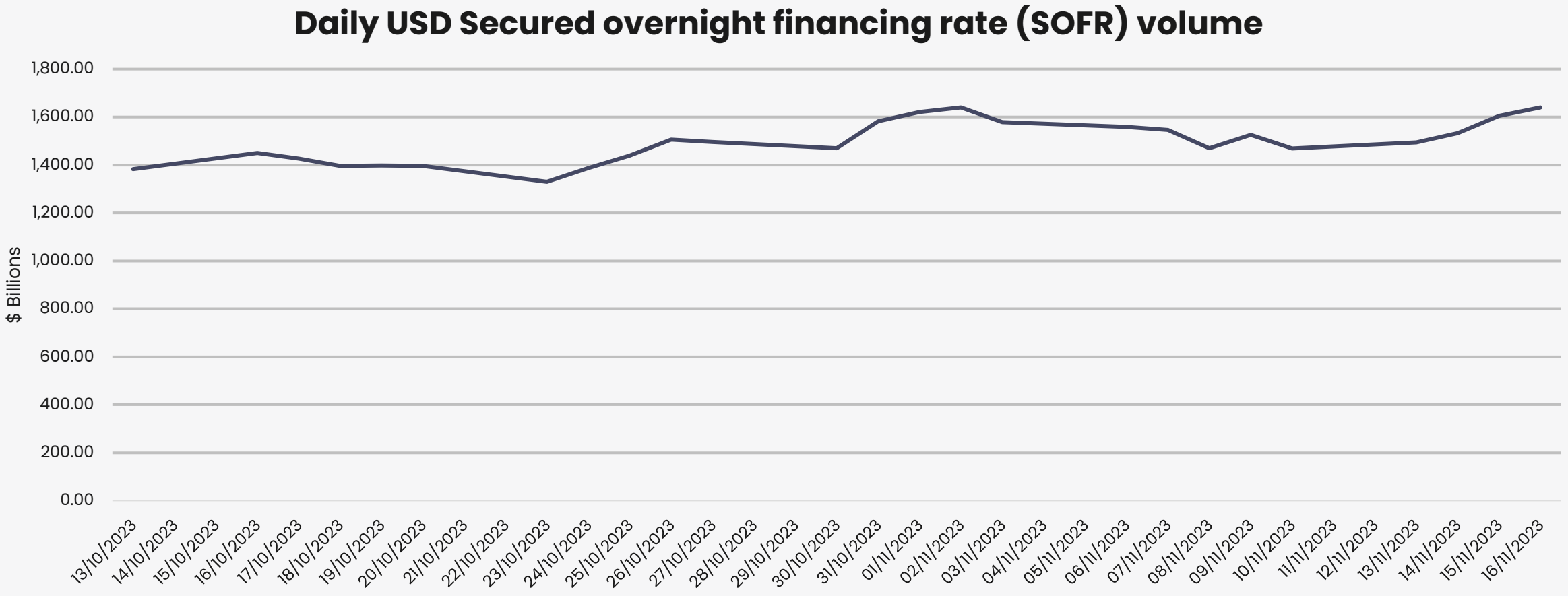
When a trader wishes to obtain a particular bond, they can borrow it in the repo market.

They may wish to borrow the bond to fill a client order or to short the bond.

Institutional investors use repo to invest excess cash.

Repo provides a very safe and liquid option for cash investments.

# US Repo Market Size




**Source:** New York Fed





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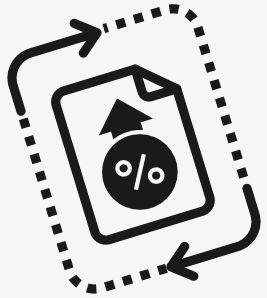
# Money Market Benchmark Rates



Publicly accessible, regularly updated interest rates that reflect the general level of borrowing costs in a specific market.

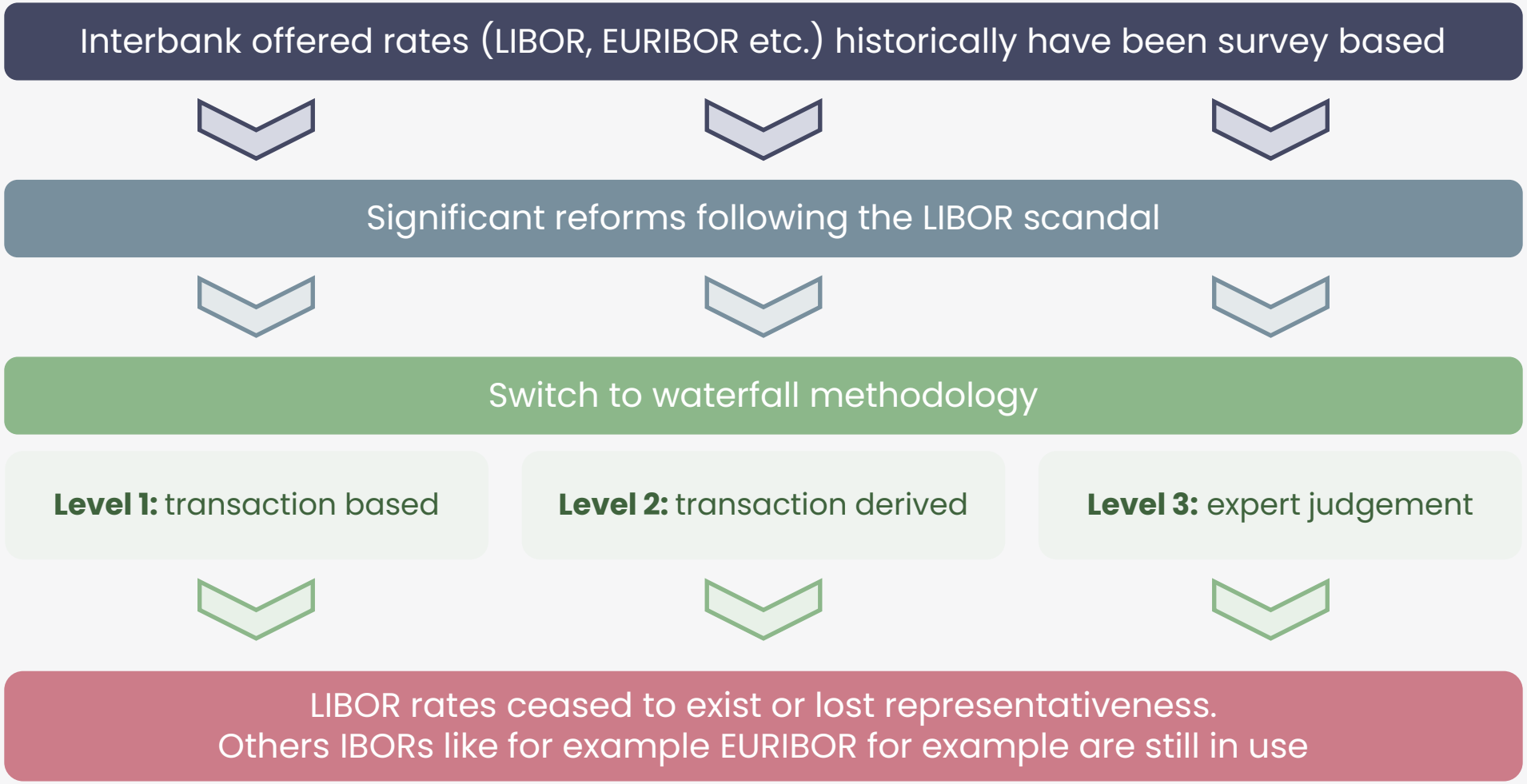
**Term Deposit** Benchmarks

**IBORs**

**Overnight Rate** Benchmarks

**Near risk-free rates (RFRs)**

# IBORs



# Near Risk Free Rates (RFRs)

Market-led working groups identified suitable, transaction-based alternatives to IBORs

| SOFR (USD) | SONIA (GBP) | ESTR (EUR) | TONAR (JPY) |
|---|---|---|---|
| Secured overnight financing rate | Sterling Overnight Index Average | Euro Short Term Rate | Tokyo Overnight Average Rate |
| Based on overnight repos (US Treasuries) | Based on unsecured overnight borrowing | Based on unsecured overnight borrowing | Based on unsecured overnight borrowing |
| Published by the New York Fed at 8:00 am New York time on the following business day | Published by the Bank of England at 9:00 am London time on the following business day | Published by the European Central Bank at 8:00 am Frankfurt time on the following business day | Published by the Bank of Japan at 10:00 am Tokyo time on the following business day |

# The Link Between Central Bank Rates and RFRs

## Changes in official interest rates…

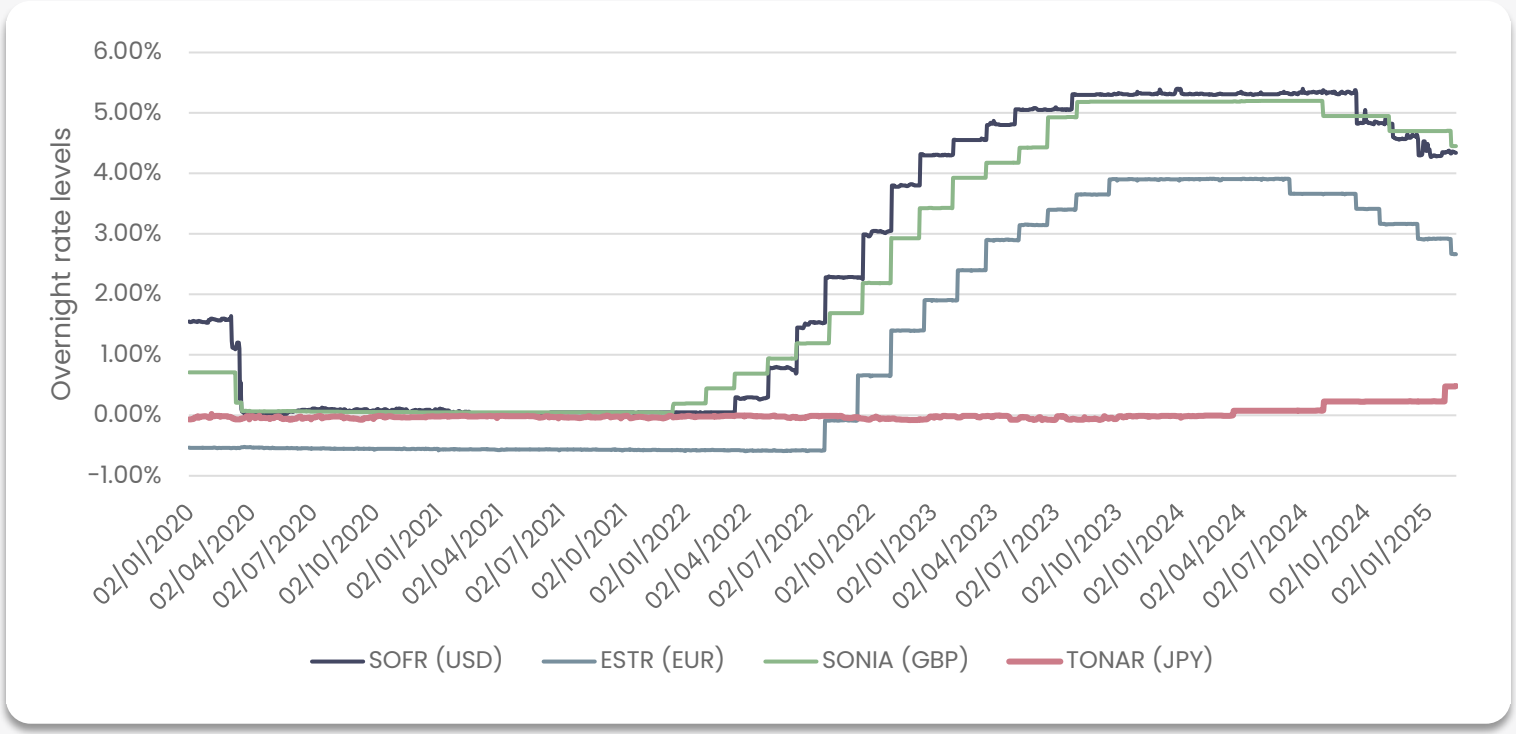
The central bank provides funds to the banking system and charges interest. Given its monopoly power over the issuing of money, the central bank can fully determine this interest rate.

## …affects banks and money-market interest rates

The change in the official interest rates affects directly money-market interest rates and, indirectly, lending and deposit rates, which are set by banks to their customers.

## …affects expectations and longer-term rates

Expectations of future official interest-rate changes affect medium and long-term interest rates. In particular, longer-term interest rates depend in part on market expectations about the future course of short-term rates.




**Source:** "Transmission mechanism of monetary policy" (www.ecb.Europa.eu)

**Source:** Infront





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