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The euro short-term rate (€STR) – the new role of central bank statistics in financial markets – a financial benchmark fully based on statistical microdata¹

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The euro short-term rate (€STR) – the new role of central bank statistics in financial markets

A financial benchmark fully based on statistical microdata

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Abstract

The euro short-term rate (€STR), which has been published by the European Central Bank (ECB) since October 2019, is the overnight interest rate benchmark for the euro. The launch of the €STR was part of the global reform of financial benchmarks. The €STR is determined every morning by the ECB on the basis of money market statistical microdata. This is a new use of statistical microdata and a new task beyond the classic statistical functions of central banks, with particular requirements in terms of governance, methodology, determination process and audit. The article focuses on these challenges as well as on the solutions implemented by the ECB, illustrating the evolving role of statistics and the use of statistical microdata in this field.

Keywords: euro short-term rate, €STR, financial benchmarks, microdata, granular data, money market

JEL classification: E43

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Introduction

In the era of evidence-based policymaking, official statistics set the foundations for policy and decision-making that can impact millions of citizens and influence the expenditure of billions of euros. ECB official statistics are subject to high standards that ensure the accuracy, consistency and timeliness. They are produced in line with international standards, without any outside interference. The independence of official statistics is the pillar for safeguarding their quality, avoiding political influence and conflicts of interest that could affect the provision of data.

Following the global financial crisis, granular data collections and micro-databases have become increasingly relevant to produce statistics. As a result, the scope of central bank statistics is moving beyond aggregates to micro - hence more detailed - data. The use of granular data allows the both the direct use of microdata and the compilation of aggregates (on a regular and on a flexible ad-hoc basis). The Money Market Statistical Reporting (MMSR) and subsequently the euro short-term rate (€STR) are two noteworthy examples of how the ECB uses microdata.

Historical background on financial benchmarks

Cases of manipulation of interest rate benchmarks, as occurred some years ago with the London Interbank Offered Rate (LIBOR), had a negative impact on financial stability and ultimately affected the real economy. In this respect, initiatives at both global and European level were set up to introduce a global reform to address the vulnerability of some benchmarks to possible manipulation when volumes declined in the markets they were supposed to represent, ensuring the accuracy and integrity of the indices used as benchmarks and promoting near risk-free rates.

The principles for the reform of financial benchmarks obtained a wide consensus. However, in some cases previously existing benchmarks had difficulties in implementing these principles. For this reason, several central banks around the world decided to publish new financial benchmarks, addressing the risk of a sudden discontinuation of existing benchmarks and a potential market failure. Against this background, in September 2017 the ECB decided to develop the euro short-term rate (€STR) based on data already available to the Eurosystem.

The ECB was already collecting granular, timely, daily statistical data on the money market activities of selected euro area banks across four market segments: unsecured money market, secured money market, foreign exchange swap market and overnight index swaps market. The data were readily available to the ECB, in order to fulfil its tasks, in particular the monetary policy implementation. The data were considered of sufficient quality and timeliness to serve the daily production of a reference rate.

The €STR has been published by the ECB since 2 October 2019. The ECB, as administrator of the benchmark, has overall responsibility for providing the rate. The determination process of the €STR follows precise steps and rules, from the sending of the data by reporting agents up to the publication of the rate by the ECB. The €STR determination process is designed to provide the maximum quality while delivering the rate daily and on time, and complying, where relevant and appropriate, with the International Organization of Securities Commissions (IOSCO) principles on financial benchmark, covered in section 4.

This paper describes the €STR and its determination, as well as the challenges faced by the ECB in its production, illustrating the evolving role of statistics in this field. The €STR represents a new use of statistical microdata and a new task beyond the classical functions of central banks, with a number of new requirements.

The main features of the €STR are summarised in the second section, the €STR determination process and the advantages in producing the €STR from statistical microdata are covered in the third section. The fourth section describes the challenges and solutions related to the €STR. The fifth section concludes.

The euro short-term rate (€STR)

The €STR is a rate which reflects the wholesale euro unsecured overnight borrowing costs of euro area banks. It is exclusively based on borrowing transactions in euro conducted with financial counterparties deemed to be executed at arm's length. Out of the potential MMSR instrument categories, the €STR is calculated using overnight unsecured fixed-rate deposit transactions over € 1 million. The €STR is calculated as a volume-weighted trimmed mean of the relevant transactions, removing the top and bottom 25 % rates in terms of volume before calculating the mean.

The €STR publication is accompanied by complementary information on the data used for its computation (volume and number of €STR-eligible transactions), the reporting agents (number of banks reporting €STR-eligible transactions, share in the total volume of the largest 5 contributors), indicators on the dispersion of the data (rate at 25th and 75th percentiles), the publication type (standard or republication) and the calculation method (normal or contingency), see charts 1 and 2.

Chart 1. Euro short-term rate and quartiles

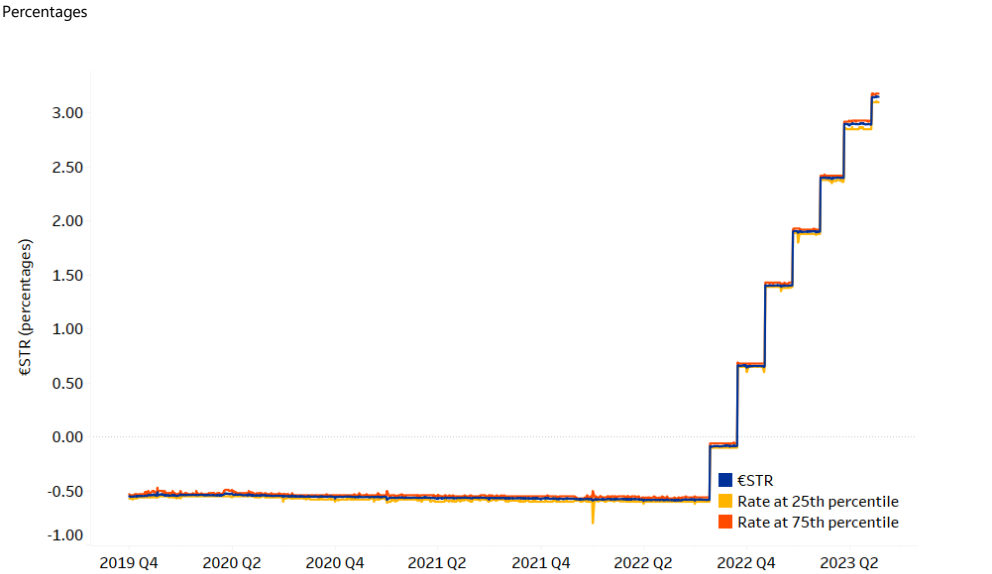
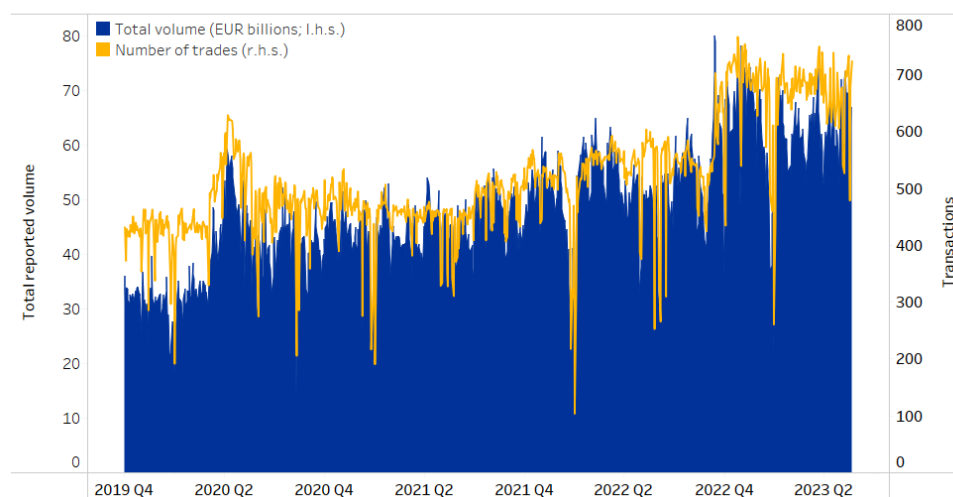


Chart 2. Euro short-term rate volumes and number of transactions

Left hand side: EUR billion; right hand side: number



The rate is published for each TARGET2 business day based on transactions conducted and settled on the previous day (reporting date T) with a maturity date on T+1.

From EONIA to the €STR

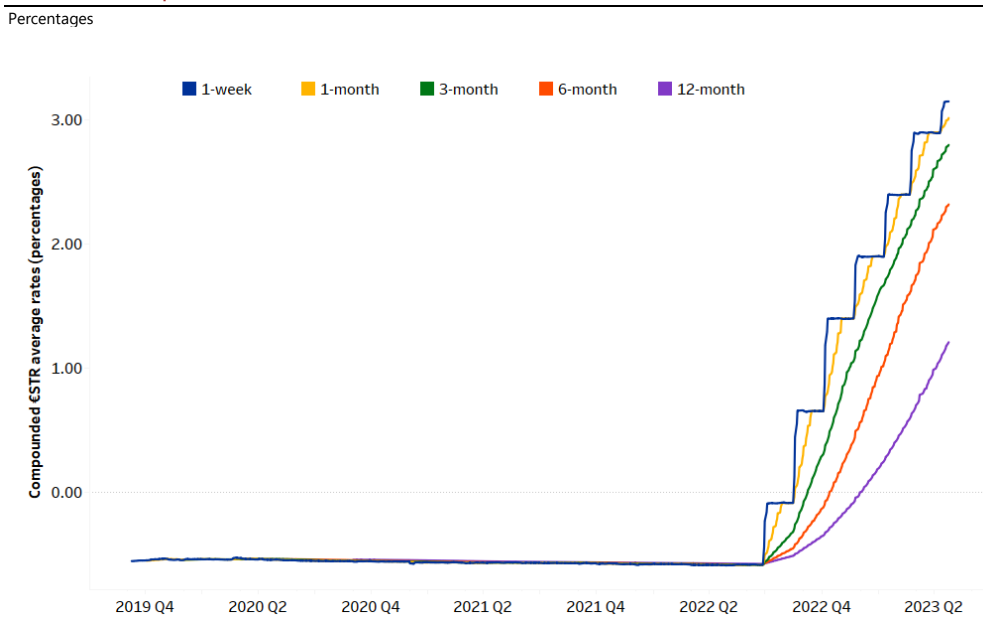
Following a carefully planned transition, which involved a transition period during which both benchmarks existed and during which EONIA methodology had been modified to become €STR plus a fixed spread on 8.5 basis points, the €STR successfully replaced the Euro OverNight Index Average (EONIA), as the benchmark overnight rate for the euro. The transition took place over several years, guided by a private sector working group on euro risk-free rates (WG RFR) in line with the guidance of the Financial Stability Board (FSB). Users of EONIA managed to successfully switch to the new benchmark within the required deadlines.

With the discontinuation of EONIA on 3 January 2022, the €STR became the only overnight benchmark rate for the euro. The €STR, much like previously EONIA, is now mainly used in derivatives such as Overnight Index Swaps (OIS) contracts. In response to the recommendations of the FSB, the WG RFR is considering other uses, including in cash market and cross-currency products.

The €STR is also the fallback in Euro Interbank Offered Rate (EURIBOR) contracts, should that rate cease to exist in future. The ISDA introduced €STR-based fallback provisions in its standard documentation to cater for discontinuation of EUR London Interbank Offered Rate (LIBOR) and EURIBOR. The WG RFR issued recommendations for €STR-based fallback rates in cash market products linked to EURIBOR. Depending on the asset class, the recommendations suggest using either forward-looking €STR rates (subject to their future availability), or a compounded €STR rate in all other cases.

In response to market feedback, the ECB publishes also a compounded €STR average rates and a compounded index based on the €STR. The rates are backward-looking compounded averages of the €STR calculated over standardised tenors of one week, one month, three months, six months and twelve months, see chart 3. The compounded €STR index makes it possible to calculate a compounded €STR average rate over any other tenor of choice. The ECB started on 15 April 2021 with the publication of the compounded average rates and a compounded index based on the €STR.

Chart 3. Compounded €STR



Benchmark rates like the €STR are a useful reference for many financial contracts, as they are publicly accessible, published by an independent institution on a regular basis following a transparent methodology that reflects market developments fairly and objectively, and are an important component for the monetary policy transmission. Reliable benchmarks are also necessary for the smooth functioning of money markets, and therefore for financial stability.

The €STR determination process

The €STR determination process in the ECB statistical function

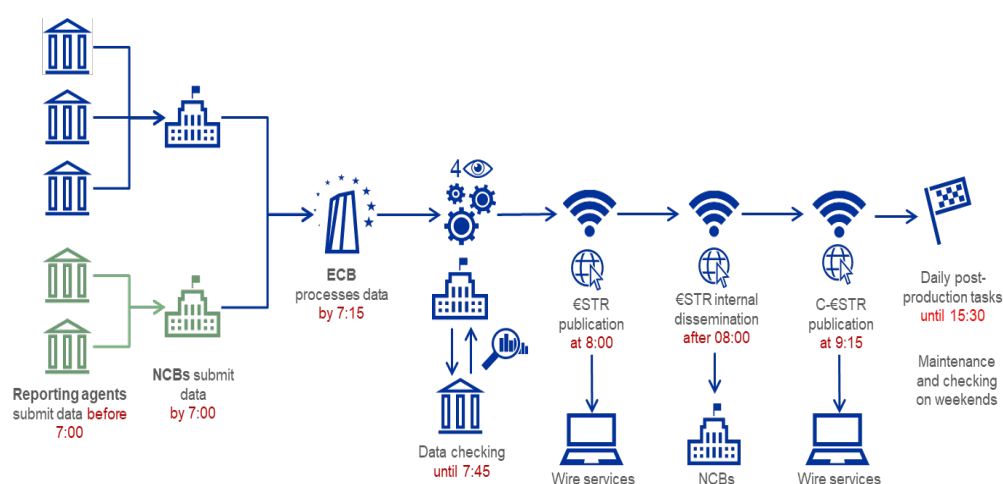
The process of collecting MMSR data starts at the reporting agents, i.e. the 47 banks that currently constitute the MMSR reporting population. The reporting banks compile the data and send them to the corresponding National Central Bank (NCB) or ECB collection platform. The collection platforms receive the data and automatically perform initial checks on their format and content. The data are then submitted to the ECB by 07:00 Central European Time (CET).

The ECB performs additional quality checks and applies filters to automatically select the subset of transactions traded in the unsecured market segment eligible for calculating the €STR. Targeted data quality checks are then carried out exclusively on this subset. In particular, the correctness of the selected transactions is checked with reporting agents before the calculation of the €STR.

The €STR and the accompanying information are then automatically calculated and published, after a final check, at 08:00 CET. If errors with an impact larger than two basis points are detected following the publication, the ECB will revise and re-publish the €STR at 09:00 CET, although such an event has never occurred at the time of writing. No changes are made to the €STR after that time. At 09:15 CET, the compounded €STR (C-€STR) average rates and index, fully based on the €STR are published. Chart 4 shows a graphical representation of the €STR determination process.

Chart 4. The €STR determination process

Graphical representation



The performance of the €STR determination process as part of the statistical function provides benefits for the overall daily process and data management. In general terms, the pre-existence of the MMSR data quality process provides a strong basis for the €STR, supported by sets of automatic checks and daily contacts by the ECB and NCBs with the reporting agents. The overall €STR data checking process includes the following elements:

- Formal checks. The formal correction of the reported files is ensured through the so-called level one (L1) checks. These checks ensure that the files received are fully in line with the technical requirements as established in the MMSR reporting requirements.
- Basic business checks. Checks on the data reported are then performed, rejecting data that do not comply with the MMSR rules or providing warnings in dubious cases. These checks, the so-called level two (L2) checks, ensure that the data reported for each transaction comply with the respective minimum standards on data quality.

- Plausibility checks. Plausibility checks performed on targeted on specific €STR eligible transactions, so-called level three (L3) checks, also take advantage of the pre-existing contact points and expertise in reporting agents. Reporting agents confirm the correctness of these selected transactions before the calculation of €STR, excluding them in case errors are detected.
- Post-production checks. The so-called level four (L4) checks, performed after €STR publication, aim at detecting potential systematic issues regarding €STR eligible transactions and are carried out together with the daily performance of MMSR data quality process. The L4 checks include outlier detection as well as consistency checks with other MMSR data.

From an institutional perspective, the statistical function also provides several features and objectives, as established in the Public Commitment on European Statistics by the ECB, that serve as well the €STR determination process. In particular, the following features are underlined:

- Institutional features. The ECB's statistical function is granted with professional independence, legal mandates for the data collection, dedicated resources, an explicit commitment to quality, statistical confidentiality rules in place and aims at impartiality and objectivity.
- Processes and output. The ECB's statistical function also has a commitment to appropriate procedures, minimizing the reporting burden and being cost-effective. The output objectives include relevance, accuracy and reliability, timeliness, consistency and accessibility.

Advantages of basing the €STR on money market statistical data

The €STR is based on daily confidential statistical information on individual money market transactions collected by the ECB. The use of pre-existing statistical data to produce the €STR involves a series of relevant technical and operational advantages:

- Avoid double reporting. The use of the pre-existing statistical data permits to avoid the establishment of an additional reporting for the purpose of calculating the €STR. The transaction-by-transaction reporting provides the necessary flexibility to aggregate the data according to the €STR methodology, in addition to other aggregations for analytical purposes, without changing the underlying data collection.
- Avoid submissions for the purpose of compiling a benchmark. The use of the pre-existing statistical data permits to avoid the collection of data submitted solely for the purpose of compiling a benchmark, a practice that can create additional vulnerabilities such as conflicts of interest and incentives for manipulation, as indicated in the IOSCO principles. The production of benchmarks based on submissions may also imply risks on the continuity of the benchmark, as these submissions are typically voluntary, which may result in an insufficient number of contributors, low business volumes, high concentration and/or low representativeness.
- Avoid expert judgement. The €STR is automatically calculated using pre-existing statistical data related to actual transactions conducted by the MMSR reporting agents in financial markets. No extrapolations or

adjustments are made to the reported values, therefore avoiding expert judgement as defined in the IOSCO principles.

- Use of international standards and harmonized data. The MMSR transaction-by-transaction data include the necessary attributes for the checking and use of the data. Each transaction is reported with a proprietary identifier assigned by each reporting agent, which permits to detect duplicates and facilitates the exchange of information on specific transactions. The data collection also requires the reporting of the Legal Entity Identifier (LEI) of the reporter and, if available, of the transaction counterparty. This allows standardization of the processes, a high degree of harmonization in the economic sector classification of the counterparties and deeper quality checks. The ECB ensures that a single economic sector classification is consistently assigned to each relevant institution for all statistical purposes in line with the European System of Accounts 2010, which implements the System of National Accounts 2008 in the European Union. ISO international standards are used wherever appropriate, including ISO20022 which defines the format of the reported data.² This results in a single standardized reporting framework applicable across the euro area. The ISO20022 standard is also used for example by the Bank of England for its Sterling Money Market (SMM) data collection or for the Securities Financing Transactions (SFT) Reporting of the European Securities and Markets Authority (ESMA). This allows reporting agents to implement similar format standards for different reporting requirements, reducing the reporting burden and minimizing the risk of errors in the reporting systems.
- Compliance procedure on statistical data submission. The data quality management process is complemented by the overall statistical non-compliance framework that provides the tools for the monitoring and enforcement of the reporting agents compliance with the minimum standards of transmission, accuracy, and revisions, as defined in the MMSR Regulation. In case non-compliance is observed, an infringement procedure can be initiated, and sanctions may be imposed in accordance with the applicable legal framework.
- Allow the publication of the pre-€STR. The pre-€STR was an indicator published by the ECB previously to the launch of the €STR, for information purposes. The pre-€STR was also used to calculate the fixed spread EONIA-€STR for the transition period in which both benchmarks co-existed. During this time the EONIA was calculated as €STR plus the fixed spread. The pre-€STR, which included more than two years of daily data, could be provided to the market participants in preparation of the launch of the €STR thanks to the pre-existence of the MMSR data.

² The International Organization for Standardization (ISO) is the most relevant international institution in the field of standardization.

Challenges and solutions in producing €STR

In July 2013 the IOSCO issued a set of principles for financial benchmarks (the IOSCO Principles), following a series of attempted market manipulation of global reference rates coupled with a declining liquidity in the underlying markets. These developments reduced the confidence of financial markets in the reliability and robustness of existing interbank interest rate benchmarks which play a pivotal role in the global financial system because of their usage in a broad range of financial products and contracts.

The IOSCO Principles were intended to promote the reliability of benchmark determinations, and address benchmark governance, quality and accountability mechanisms. The Principles provide a framework of standards that administrators should implement according to the specificities of each benchmark and cover various areas including governance aspects, the methodology of benchmarks, the determination process as well as accountability aspects.

As a central bank, the ECB is not within scope of the IOSCO Principles, nor is it subject to the EU Benchmark Regulation, since central banks already meet the principles, standards and procedures which ensure that it performs its activities with integrity and in an independent manner. Nevertheless, it was considered proper, where relevant and appropriate, for the €STR framework to be in line with international best practice for the provision of financial benchmarks, in particular with the IOSCO Principles. The implementation of these requirements goes beyond classical statistics in some aspects, as set out below.

Governance

While the €STR is based on transactions that reporting agents submit in accordance with the MMSR Regulation a distinction is made between the governance of the MMSR and of the €STR itself.

Being a statistical reporting, the MMSR is part of the ECB statistical framework, which is governed by the Statute of the European System of Central Banks (ESCB) and of the ECB. Regarding the collection of statistical information, the Statute establishes that the ECB, assisted by NCBs, collects the statistical information and contributes to the rules and practices governing the collection, compilation and distribution of statistics. In addition, the European Union Council Regulation (EC) 2533/98 concerning the collection of statistical information by the ECB lays down the regulatory powers of the ECB in the field of statistics. It establishes, inter alia, the potential reporting population for statistical purposes, the areas on which the ECB can collect data and the overall confidentiality and enforcement (non-compliance) aspects of ECB statistical data collections.

The Regulation (EU) No 1333/2014 (ECB/2014/48) provides the legal foundation for the MMSR data collection allowing to calculate the €STR on previously existing data. It directly addresses the reporting agents, establishes their daily reporting obligations including the scope and timeliness of the data. The MMSR Regulation lists and defines the specific attributes to be reported in respect of each transaction in the secured, unsecured, foreign exchange swap and overnight index swap euro money market segments. The MMSR Regulation also defines the roles of the NCBs with respect to

the collection of the data and establishes a set of minimum standards regarding the transmission, accuracy, conceptual compliance and revisions, as well as minimum standards for data integrity. In case of non-compliance with the reporting obligations, an infringement procedure can be initiated, and sanctions may be imposed on the reporting agents.

In turn the €STR is specifically governed by Guideline (EU) 2019/1256 on the euro short-term (ECB/2019/19) (the €STR Guideline). ECB guidelines are legal acts that are legally binding on the ECB itself and/or on the ESCB members whose Member State has adopted the single currency. The €STR Guideline establishes the overall governance of the €STR, including the ECB's responsibility for the administration and oversight of the €STR and the tasks and responsibilities of the ECB and NCBs with respect to their contribution to the €STR determination process and related procedures. Internal Eurosystem rules complement the Guideline by further specifying the required high criticality of the IT systems as well as detailing the operational tasks to be performed in the €STR calculation. The €STR governance framework ensures consistency with the €STR methodology and policies and also guarantees that no expert judgement is involved in the €STR.

The €STR Guideline also establishes the ECB's control framework to protect the integrity and independence of the rate and its determination process and to address any existing or potential conflicts of interest that might otherwise compromise its integrity and reliability. The control framework refers to the ECB's and the Eurosystem's common corporate ethical culture as embedded in the ECB Ethics framework (which applies to all ECB staff), the ethical standards for all central banks of the Eurosystem (Eurosystem Guideline), established by the Governing Council, and the Code of Conduct for high-level ECB officials. For example, staff members and high-level officials are expressly prohibited from taking advantage of inside information in any private financial transaction or to recommend or advise against such transactions.

The €STR Guideline further establishes a €STR Oversight Committee which reviews, challenges and reports on all aspects of the €STR determination process as established by the €STR Guideline. The Oversight Committee acts as an advisory body to the ECB's Executive Board and the Governing Council.

Methodology

The method of calculation of the €STR is defined in the published €STR methodology and policies. The €STR methodology was developed by the ECB's Directorate General Market Operations together with experts from other business areas. To align the definition and features of new rate with the needs of the prospective user base two public consultations were conducted during the design phase. While the first consultation focused on more general considerations such as scope, the second consultation was dedicated to more detailed methodological aspects regarding key operational and technical parameters. Market participants strongly backed the proposals put forward for consultation. In addition, the design and implementation of the new unsecured overnight rate aims at being consistent with international best practices as set out in the IOSCO Principles.

The definition of the €STR has two elements regarding (1) the statement of the underlying interest represented by the euro short-term rate and (2) the statement of

the methodology setting out which transactions are considered for the calculation and the details on the calculation process. The underlying interest of the €STR was defined as the wholesale euro unsecured overnight borrowing costs of euro area banks. In comparison to EONIA that was based on interbank lending only, the €STR includes short-term borrowing from a wider set of counterparties by covering borrowing activity beyond the interbank segment. The €STR is calculated using euro denominated overnight unsecured fixed-rate deposit transactions over € 1 million received from financial counterparties. Unsecured deposits are standardised and are the most frequent means of conducting arm's length transactions on the basis of a competitive procedure, thereby limiting idiosyncratic factors potentially influencing the volatility of the rate. The €STR is calculated for each TARGET2 day as a volume weighted trimmed mean of the eligible transactions. The trimming aims at protecting the rate from idiosyncratic volatility caused by transactions priced off the market, or from errors in the underlying statistical data. The volume-weighted trimmed mean is calculated by (1) ordering transactions from the lowest rate to the highest rate; (2) aggregating the transactions occurring at each rate level; (3) removing the top and bottom 25% in volume terms; and (4) calculating the mean of the remaining 50% of the volume-weighted distribution of rates.

The methodology also includes a contingency formula for calculating the rate in case of insufficient underlying data. This could include cases where (i) there is a lack of data; (ii) there is a possible concentration of inputs; or (iii) systems break down, preventing a sufficient data feed and thereby hindering the calculation of a representative transaction-based rate. The contingency calculation is triggered in case the number of reporting banks is less than 20 or five banks account for 75% or more of total transaction volumes. In case the €STR is calculated based on the contingency formula it represents a weighted average of the previous day's €STR and the rate resulting from using the data for the current day. Annual methodology reviews are conducted to confirm that the €STR remains a fair reflection of market movements, that it is backed by sufficient underlying data and that the scope and calculation method selected are therefore adequate.

In a further public consultation, the design of the compounded €STR (C-€STR) and its calculation and publication rules were consulted with the market participants. The C-€STR average rates are entirely computed by using the publicly available historical daily values of the €STR and yields and average rate for the respective tenor over which the €STR values were recorded.

Determination process

To ensure a reliable determination and publication of the €STR for the operational implementation a dedicated IT system with high criticality standards was set up. Eurosystem-internal operational procedures provide detailed guidance on the tasks of the operators. These were both tested extensively during a shadow production period of nine months before the start of the publication of the €STR.

The €STR is published on every TARGET2 business day³ at 8:00 CET based on the eligible transactions traded on the previous TARGET2 business day. The daily shift for the production of the rate starts at 6:30 CET. To minimize the risk of incidents affecting the production and publication of the rate, the proper functioning of the €STR IT system is regularly tested on weekends following IT maintenance activities with potential impact on the €STR production. As the production of the €STR requires staff working on weekends, public holidays and before regular office hours, a weekly shift work system is established. The shift work is performed on a rotating basis by staff members trained on all aspects of the production and publication of the rate. The rotation system also serves to reduce key person risk.

The production and publication of the €STR is highly automated and does not require the use of discretion, minimizing the risk of errors during the process. The collection of the data and the regular functioning of the processes up to the publication of the rate are monitored by the €STR operators who can initiate manual back-up procedures in case of need. The €STR operators also interact with reporting agents as part of the data quality process and perform a final check on the figures to be published.

Audit

Both internal and external audits are conducted in the context of the €STR. Internal audits have so far been conducted on the design and implementation of the €STR as well as on its operation following its go-live. The internal audits are performed in accordance with the ECB Audit Charter and the Audit Charter for the Eurosystem / ESCB and the Single Supervisory Mechanism.

The ECB also appointed an external auditor to independently assess the overall framework used by the ECB to administer the €STR for compliance with the IOSCO Principles. This included the control processes defined in relation to governance, quality, and accountability aspects over the €STR. The outcome of the audit was reflected in an assurance report published by the ECB.

Conclusions

The €STR, which has been published by the ECB since October 2019, is the overnight interest rate benchmark for the euro. The launch of the €STR was part of a global reform of financial benchmarks. The €STR is determined every morning by the ECB on the basis of money market statistical data.

The ECB Directorate General Statistics takes care of the determination process. This is a new use of statistical microdata and a new task beyond the classic statistical functions of central banks, with particular requirements in terms of governance, methodology, determination process and audits. The €STR benefits from a number of operational advantages resulting on being fully based on pre-existing statistical

³ TARGET2 is the real-time gross settlement (RTGS) system owned and operated by the Eurosystem. TARGET2 is open every day, with the exception of: Saturdays; Sundays; New Year's Day; Good Friday and Easter Monday; 1 May (Labour Day); Christmas Day; and 26 December.

microdata. At the same time the €STR involves particular requirements and challenges beyond classical statistical functions, which have been addressed through a dedicated legal act for €STR, a specific methodology developed by the ECB's Directorate General Market Operations and involving public consultations, highly critical IT systems and internal and external audits.

The successful implementation of the €STR is an example of the increasing relevance of statistical microdata and of their usage beyond classical statistical functions and responsibilities.

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EUROPEAN CENTRAL BANK

EUROSYSTEM

The euro short-term rate (€STR)

The new role of central bank statistics in financial markets



25/08/2022

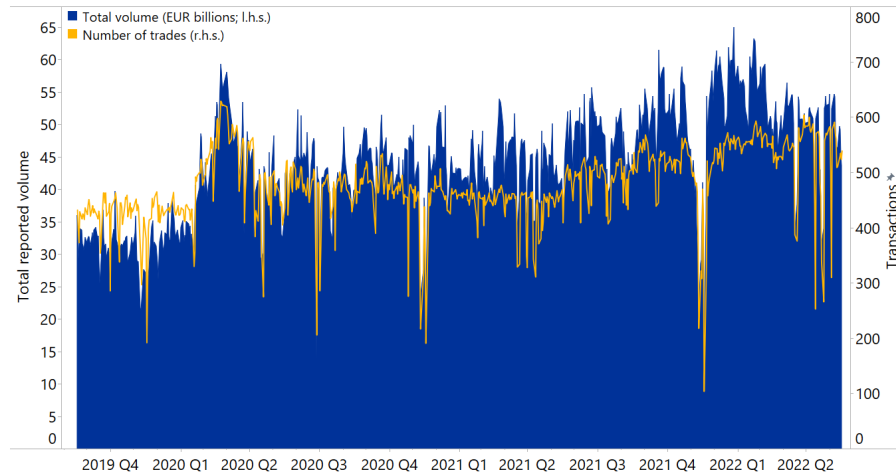
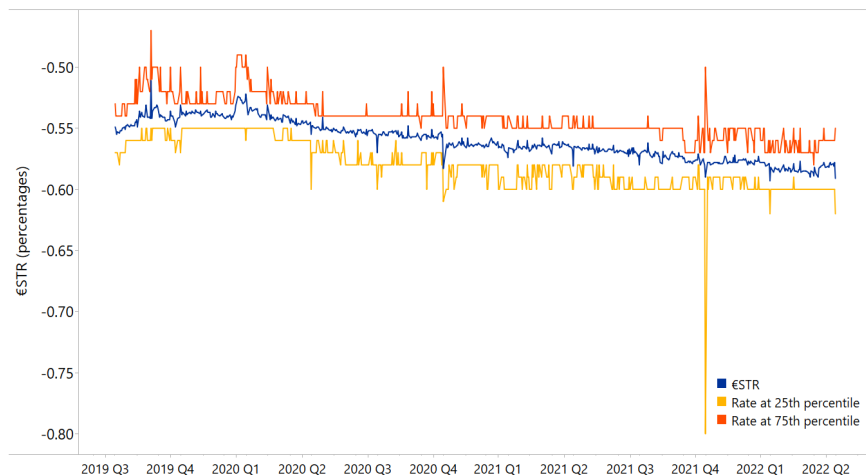
L. Amorese, J. Huerga, R. Rühmkorf

Introduction and historical background

- Following the global financial crisis, **granular data collections and micro-databases** became increasingly relevant to produce statistics and beyond
- In the context of the **reform of financial benchmarks**, the ECB decided in 2017 to develop the euro short-term rate (€STR) based on the Money Market Statistical Reporting (MMSR) data **already available** to the Eurosystem
- MMSR data were considered of **sufficient quality and timeliness** to serve the daily production of a reference rate
- The €STR has been published since **2 October 2019**, by the **ECB as administrator**, on every day on which the Eurosystem TARGET2 payment system is open
- Following a transition period, the €STR **successfully replaced the** euro overnight interest average (**EONIA**) as the overnight benchmark rate for the euro and it is the **fallback** in the euro interbank offered rate (**EURIBOR**) in case of future cessation
- Money market statistical reporting (**MMSR**) and the euro short-term rate (**€STR**) are two noteworthy examples of how the ECB uses microdata for **market surveillance** and other purposes.

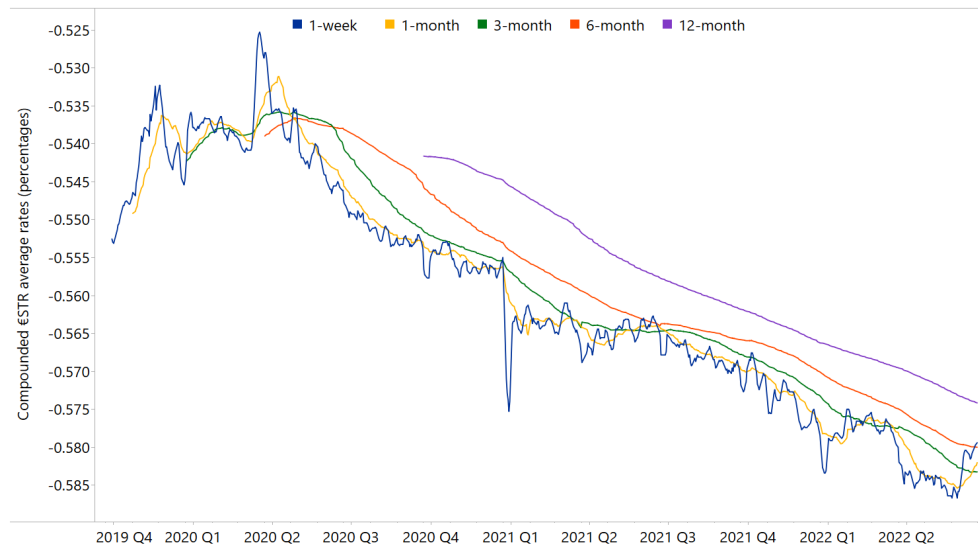
€STR (1/2)

- The €STR reflects the **wholesale** euro **unsecured overnight borrowing** costs of euro area banks
- It is exclusively based on **borrowing** transactions by MMSR reporters **with financial counterparties** on **fixed rate unsecured overnight deposits** denominated in **euro, over €1 million**
- It is calculated as a **volume-weighted trimmed mean** of the relevant transactions, removing the top and bottom 25% rates in terms of volume before computing the mean



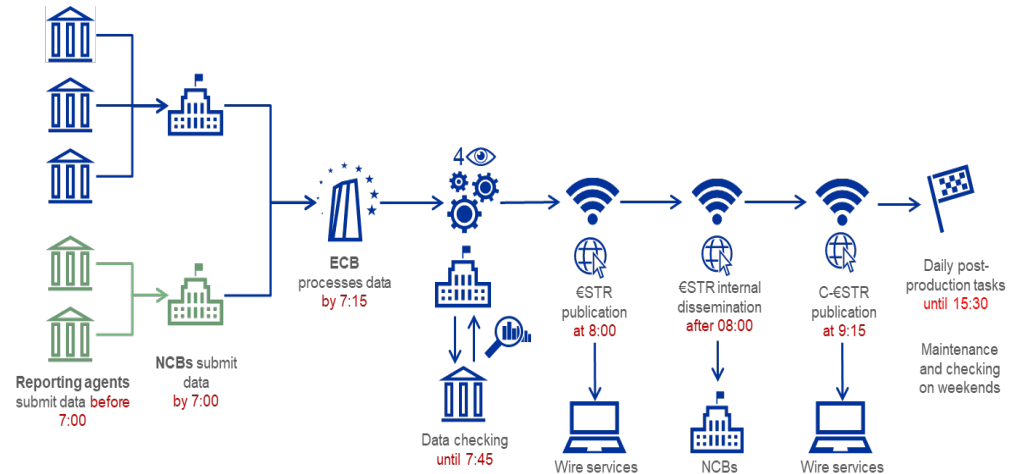
€STR (2/2)

- Figures published daily **in addition to the rate**
 - Business **volume**
 - **Number** of €STR-eligible **transactions**
 - **Number of banks** reporting €STR-eligible transactions
 - Share in the total volume of the **largest 5 contributors**
 - Rate at the **25th and 75th percentile** as indicators on the dispersion of the data
 - **Publication type** (standard or republication)
 - **Calculation method** (normal or contingency)
 - **Compounded €STR average rates and compounded index** - backward-looking calculated over tenors 1W, 1M, 3M, 6M, 12M



€STR determination process

- €STR determination process as part of the statistical function provides **benefits** for the overall daily process and data management
- **Pre-existence** of the MMSR data and quality process **avoids double reporting** and provides a strong basis for the €STR with the reporting agents
- It **avoids submission solely for the purpose of compiling a benchmark**
- The use of actual transactions and automatic calculation **avoids expert judgement**
- The data quality management process is complemented by the overall **statistical non-compliance framework** to ensure **compliance** with the **minimum standards for the reporting of MMSR data**



€STR challenges - Governance

- The ECB, as a central bank, is not in the scope of the IOSCO Principles, nor subject to the EU Benchmark Regulation. Nevertheless, the €STR is **in line with international best practice for the provision of financial benchmarks**, in particular with the IOSCO Principles
- **EU and ECB regulations** provide the legal foundation for the MMSR data, establishing the daily reporting obligations including the scope and timeliness of the data
- €STR is **specifically governed** by the ECB **€STR Guideline**, including the **ECB's responsibility** for the **administration** and **oversight** of the €STR and the tasks and responsibilities of euro area national central banks (NCBs)
- Internal Eurosystem rules complement the Guideline by specifying the required high criticality of the IT systems as well as detailing the operational tasks to be performed in the €STR calculation
- The €STR guideline establishes the €STR **Oversight Committee** which reviews, challenges and reports on all aspects of the determination process
- The €STR governance framework ensures **consistency** with the €STR **methodology** and policies and also guarantees that **no expert judgement** is involved in the €STR

€STR challenges - Methodology

- The method of calculation of the €STR is defined in the published **€STR methodology and policies**. The €STR methodology was developed by the ECB's **Directorate General Market Operations**.
- To align the definition and features of new rate with the needs of users, two **public consultations** were conducted to define the scope and key technical/operational parameters.
- The methodology also includes a **contingency formula** for calculating the rate in case of insufficient underlying data.

This could include cases where:

- I. there is a lack of data
 - II. there is a possible concentration of inputs or
 - III. systems break down
- In case the €STR is calculated based on the contingency formula it represents a weighted average of the previous day's €STR and the rate resulting from using the data for the current day.
 - **Annual methodology reviews** are conducted

€STR challenges – Determination process and audit

- The €STR IT system with **high criticality standards** to ensure a reliable determination and publication
- Internal procedures were **extensively tested** in the 9-months shadow production period which anticipated the €STR go-live
- The ECB daily shift for the rate production starts at 06:30 CET on every TARGET2 business day
- Additional IT **system testing** is regularly performed on **weekends** to **minimize** the risk of **incidents**
- The production and publication of the €STR is **highly automated** and does not require the use of discretion, **minimizing** the risk of **errors** during the process
- The €STR operators monitor the process, **interact** with reporting agents as part of the data quality process, perform manual tasks in case automatic procedures fail and carry out a **final check** on the figures to be published
- Both **internal** and **external audits** are conducted in the context of the €STR
 - Internal exercise – in accordance with the ECB Audit Charter and the Audit charter for the ESCB and SSM
 - External exercise – to independently assess the overall framework used by the ECB as €STR administrator for compliance with the IOSCO principles

Conclusions⁽¹⁾

- MMSR and €STR confidential statistical information is **widely used** by ECB DG-M and NCBs for
 - the **definition** and **implementation** of the euro area **monetary policy**
 - **monitoring** the monetary policy **transmission mechanism**
 - gathering info on market **expectations** for **future trajectory** of **policy rates**
 - **analytical work** supporting Eurosystem policies
- The €STR is determined **every morning** by the ECB on the basis of money market statistical data
- The €STR benefits from a number of operational advantages resulting on being fully based on **pre-existing statistical microdata**
- At the same time the €STR involves **particular requirements** and **challenges beyond classical statistical functions**, addressed through a dedicated legal act for €STR, a specific methodology, highly critical IT systems and internal and external audits
- The successful implementation of the €STR is an example of the **increasing relevance** of **statistical microdata** and of their **usage** beyond classical statistical functions and responsibilities

(1) The opinions contained in this presentation are the sole responsibility of the authors and may not reflect the views of the ECB