2023 Report on Quality and Use of Data

Table of Contents

1 Executive summary

ESMA is publishing its fourth report on the quality and use of data. The first two editions covered data reported under the European Market Infrastructure Regulation (EMIR) and the Securities Financing Transactions Regulation (SFTR). The third edition included in addition transactions data reported under the Markets in Financial Instruments Regulation (MiFIR). This year, the report additionally covers (i) transparency data published by approved publication arrangements (APAs) under MiFIR; (ii) data supporting the MiFIR transparency calculations; (iii) data reported under the Securitisation Regulation (SECR); and (iv) data on funds collected under the Alternative Investment Fund Managers Directive (AIFMD) and the Money Market Funds Regulation (MMFR).

In June 2023, ESMA updated its Data Strategy[1] to define how data assets will be mobilised to support ESMA's strategic and thematic objectives for the period 2023 to 2028. As explained in Section 2, several of those objectives are closely linked to data quality and use, in particular the objectives to share data and analytical tools with national competent authorities (NCAs), to provide access to data of public interest, to encourage the systematic use of data across within ESMA and to improve data-driven supervision.

Data plays a critical role in the day-to-day processes of NCAs, central banks (such as the European Central Bank (ECB)) and ESMA. Data is used extensively in a variety of use-cases falling under the core mandates of financial regulators, namely financial stability, orderly markets, and market integrity. Depending on the objective of the analysis, the data may be aggregated to identify emerging trends and risks; or disaggregated to investigate a specific event or participant's behaviour. The aggregation and anonymisation of regulatory data give financial regulators opportunities to publish the outcome of their analysis, thereby increasing the transparency of financial markets. In Section 3, ESMA provides an overview of those use-cases, including references to publicly available documents.

Data quality and data use function in tandem, with one naturally fuelling the other in a virtuous cycle. The key developments concerning data quality in 2023 are reported in Section 4 for each of the dataset in scope. The data quality engagement frameworks rely on the systematic identification of data quality issues via automated dashboards, the communication of the most relevant issues to NCAs and follow-up actions, until resolution. The examples provided in the report evidence the robustness of the methodology, with issues detected generally confirmed as reporting errors. Consistently with the risk-based approach, some of the issues notified concern few entities with a large impact on the whole dataset and seek to focus on the most relevant metrics (e.g. number of outstanding contracts, timeliness of valuations in EMIR, loan valuations in SFTR, traded volumes and number of transactions in MiFIR, data completeness scores in SFTR).

Moreover, the frequency in calculating data quality indicators allows to monitor more closely the evolution of the issues over time and to quantify data quality improvements. Examples of improvements are provided in the report (e.g. missing valuations, late valuations in EMIR,

---

[1] ESMA Data Strategy 2023-2028

accuracy of information on leverage in AIFMD, stress test information in MMFR), while other data quality issues tend to persist over time (e.g. derivatives with abnormal maturities and discrepancies in margins in EMIR, bond type classification in MiFIR, value of assets and portfolio indicators in MMFR).

In the context of supervision of data reporting service providers (DRSPs), ESMA constantly monitors aggregated metrics pertaining to the timeliness, completeness, availability, and integrity of data received or published by approved reporting mechanisms (ARMs) and approved publication arrangements (APAs). In 2023, the number of clients' reported files which were rejected by ARMs decreased significantly, pointing to better quality of incoming files. Improvements in APA data was also evidenced in 2023, with an abnormal rejection rate by one APA successfully addressed in the course of 2023, as well as a decrease in the average time for executing entities to submit transactions to APAs.

Leaning on more efficient data processing tools, ESMA initiated a widescale comparison of transactions reported to ARMs with those published by APAs, evidencing issues around APA data access and aggregation, and triggering follow-up actions at supervision and policy levels. ARMs transaction data was also used to detect and investigate one case of significant overreporting relevant for the MiFIR transparency calculations, the resolution of which is ongoing. The observations drawn from the data quality frameworks also yield new validation rules, enhancements of test methodologies and guidance in the definition of reporting fields.

To increase transparency with external data users, ESMA is making available in the Annex (i) the methodology to calculate the data quality indicators concerning EMIR, MiFIR transparency, AIFMD and MMFR; (ii) codes to automatically download data files from APAs websites. ESMA believes that this additional documentation will further contribute to a mutual understanding between reporting entities, market infrastructures, data users and the regulatory community and a better alignment of priorities.

2 Data quality and use in the context of the ESMA Data Strategy

2.1 ESMA Data strategy 2023-2028

ESMA updated its Data Strategy in June 2023. The new Data Strategy plays a pivotal role in achieving the objectives of ESMA Strategy 2023-2028 by elaborating on how ESMA data assets will be mobilised to best serve and help deliver on its strategic and thematic objectives in the period covered.

Four of the six objectives are intrinsically linked with the use and quality of data reported:

Objective A – Enhanced data hub: in its roadmap for 2023, ESMA identified as a key priority the development of a project to share data with national competent authorities (NCAs) by onboarding them to the ESMA data platform. Until 2023, only ESMA staff could access the data, the code repositories, the scripting and visualisation tools available on the ESMA data platform. In 2023, the system has been made technically accessible by external users, e.g. ESAs users, and it now allows for dedicated access to data and reports by the NCAs, while empowering them to use the technologies of the platform to use these data and reports.

Objective B – Access to data of public interest: ESMA possesses vast amounts of data collected under the various reporting or disclosure regimes. ESMA is mindful of the value that this brings to the markets, hence in 2023, ESMA has initiated work on updates to its webpage, to enable the publication of interactive dashboards. While in the short term, the focus is on facilitating access to the existing ESMA's statistical data, this initiative

will be expanded in the long term in the context of the development of ESAP that will significantly increase the scope of information available centrally through the ESMA system.

Objective C – Data-driven supervision: as per its roadmap for 2023-2024, ESMA continued to work on using and making available to supervisors the data, information and tools enabling data-driven supervision while harnessing the synergies between the complementary ESMA and NCAs supervisory activities. For instance, ESMA is developing the proof-of-concept for the detection of potential market abuse cases using AI techniques. During the project, ESMA and NCAs will utilise the available markets data and test different AI models with the objective to design automated solutions that could improve the efficiency and effectiveness of the NCAs' activities. The experience gathered during the proof-of-concept will facilitate the adoption of AI-based tools by ESMA and the NCAs. ESMA also facilitates the discussion between the NCAs regarding the use of supervisory technology (SupTech), so that to enhance cooperation among the NCAs and to foster common initiatives.

Objective F – Systematic data use: to enhance the systematic use of data across the organisation, in its roadmap for 2023-2026, ESMA planned to complete the migration of all suitable datasets to the ESMA data platform. In 2023, all the internal databases used by the data analysts have been copied from legacy sources to the ESMA Data Platform, allowing ESMA staff to work in a more effective manner. Data

processing is now several times faster than with the previous tools, that allows the use of higher volumes and more complex data and to combine information from the different regulatory datasets.

2.2 ESMA Data Platform

In 2022, ESMA inaugurated its Data Platform, a big data and cloud-based solution enabling more performant and more efficient data computation. The first use case was the supervision of Data Reporting Service Providers (DRSPs), a new supervisory mandate for ESMA. Since then, ESMA has continued to build upon this platform to become the data hub consolidating not only the data itself, but also the relevant analytics of the data facilitating also greater opportunities for cooperation and data sharing with the NCAs.

This platform forms a core delivery for the Data Strategy, delivering on the objectives for data efficiency, sharing of information, knowledge, and tools.

3 Key project with significant data use

3.1 Introduction

Data reporting regimes play a critical role in the identification and monitoring of risks to the integrity, orderly functioning, and stability of financial markets.

Considering the high granularity of the reported data, the potential to leverage the data for various analytical uses cases is significant. This is reflected in the number of use-cases and in-depth analyses carried out by ESMA, NCAs, ECB and ESRB.

This report covers the datasets in the following sectoral regulations under ESMA's remit: EMIR (transactions and positions in derivatives), SFTR (securities financing transactions), MiFIR (transactions in financial instruments[2]), Securitisation Regulation, AIFMD and MMFR (funds data), CRAR (ratings) and Prospectus Regulation.

While one part of the analytical work remains confidential due to the sensitivity of the underlying information, users have issued numerous publications leveraging on data[3]. Thus, the wider public can obtain an insight into the variety of ways the data is used and the value it brings to the regulatory community.

The following sub-sections provide a high-level overview of the most significant analytical use cases implemented by NCAs, ECB, ESRB[4] (collectively "users", section 3.2) and ESMA (section 3.3) in their day-to-day work as well as in ad-hoc studies.

3.2 NCAs, ECB and ESRB

3.2.1 Monitoring of trends and risks in European financial markets

At macro level, financial data is used to monitor overall trends and key market-level developments.

In 2023, users performed data-driven analysis to assess the impact on European markets of specific market events, such as Russia's invasion of Ukraine, US regional banks turmoil, the Credit Suisse takeover, and the single-name CDS market stress. Those analysis were frequently performed using a combination of several datasets, in particular EMIR, SFTR and MiFIR transaction reporting.

Other data-driven analysis aimed at measuring hedging via interest rate derivatives in the context of rising interest rates as well as at analysing the derivatives exposures of euro area counterparties towards non-EU counterparties or the impact of events on EU markets.

Users have sought to measure the impact on the financial system of commodities market participants' reactions to the energy crisis (notably the shift to uncleared OTC markets), based on EMIR data[5], and to measure the evolution of leverage of non-bank entities and identify vulnerabilities for the financial

---

---

stability, based on AIFMD, EMIR and SFTR data[6]. Prospectus data was used by AFM to provide an overview of the total of AFM-approved prospectuses that allow for issuance of sustainable bonds[7].

The 2022 turmoil on the UK Gilt market was also analysed in 2023 from different users' perspectives (e.g. analogy between the triggering causes and possible vulnerabilities in the euro area; and impact on liability-driven investment funds[8]), relying on EMIR and SFTR data[9].

EMIR data is also combined with trade repository data from other jurisdictions to monitor systemic risks at international level, for example one IOSCO workstream analysed TR data, including EMIR, to have an overview on the concentration, interconnectedness, and leverage in equity total return swaps markets.

3.2.2 Monitoring of exposures, infrastructures, and participants

Financial data reporting enables users to monitor trading activity and market exposures at the level of industries, markets, specific firms (clearing members, clients) or type of investors (high frequency traders, neobrokers, market makers, retail investors).

At counterparty level, data is used to perform audits, periodic assessments, or investigations of a sample of actors. Users establish automated fact sheets or interactive dashboards with risk indicators such as market risk, counterparty risk, liquidity risks or concentration, related to NCA-supervised entities and institutions with systemic relevance in the EU (ECB perspective). Some NCAs have established systems to monitor trading venues' activities or to rank investment firms based on their

risk profiles (using EMIR, SFTR and MiFIR data) as well as funds with substantial leverage (using AIFMD data).

In the context of the energy crisis, users have relied on EMIR data to monitor energy derivative market participants in terms of positions, margining levels, and liquidity.

3.2.3 Detection and monitoring of market abuse

The purpose of the transaction data reported under Article 26 of MiFIR is to ensure that investment firms act in a manner that promotes market integrity. To this end, NCAs have developed a variety of automated tools and alerting systems to detect behaviours that could threaten the integrity of markets under their supervision, such as market manipulation or insider dealing.

The IT systems deployed by NCAs to that purpose are calibrated to detect the known manipulative conducts and provide alerts whenever a transaction is considered suspicious, in which case is followed up by the NCAs' market surveillance staff.

Some users combine transactions on cash and derivatives markets to identify market abuse; some complement transaction data with EMIR data in the context of verifying suspicious transaction and order reports (STORs) and identifying misbehaviours. The recent energy crisis triggered particular attention on energy markets.

Given the sensitivity of the reported data and legal implications stemming from any behaviour that could constitute market abuse, the methodologies, tools, and results of analyses are generally not being made public by the authorities.

---

6 ESMA used AIFMD, EMIR and SFTR data to contribute to the FSB report on The Financial Stability Implications of Leverage in Non-Bank Financial Intermediation, FSB
7 AFM Market Watch #10

8 Irish-Resident LDI Funds and the 2022 Gilt Market Crisis, CBoI
9 ESMA used AIFMD, EMIR, MMFR and SFTR data to contribute to the ESRB analysis of EU GBP LDI funds published in the 2023 ESRB NBFI Risk Monitor.

3.2.4 Market and risk monitoring for specific segments and asset classes

Data has been used by NCAs to assess the development of specific market segments, and to analyse retail investors' activities for consumer protection purposes.

For example, the AMF used transaction reporting to quantify brokers margin levels on the French bond market, with breakdowns per type of instruments and type of client[10]; and to gain insight on the retail investors' activity and profiles[11].

Several NCAs publish risk dashboards with aggregated information on funds, including liquidity stress tests, both on alternative investment funds and money market funds[12]. ESRB publishes each year a report monitoring systemic risks and vulnerabilities associated with investment funds[13], based on AIFMD, EMIR, SFTR and MMFR data. SFTR data use-cases include the monitoring of repo market liquidity and the analysis of trading volumes around dividend dates.

Lastly, MIFIR reporting allows for a close supervision of investment firms and trading venues activity on a wide scope of asset classes and products and for giving a quasi-real-time view on the development and functioning of financial markets in Europe[14].

3.2.5 Monitoring of legal obligations

As significant data users, NCAs have developed tools to monitor compliance with the various reporting requirements. This can take the form of data quality dashboards to monitor reporting flows, internal tool to calculate positions with EMIR trade activity reports and compare it with EMIR trade state reports, data quality controls (outliers,

rejection, reconciliation, completeness, content of fields and flags), reconciliation between reported data and internal data.

Beyond reporting obligations, data is also used to supervise specific legal provisions and to support risk-based and data-driven supervision (e.g. clearing obligation, clearing thresholds, risk mitigation techniques, exemptions from clearing and reporting under EMIR; best execution under MiFIR; funds compliance with AIFMD and MMFR). EMIR data has helped prospectus supervisors to verify if the information in prospectuses on derivatives is correct.

Recently, NCAs used MiFIR transaction data specifically in the context of the ban on trading in financial instruments subject to EU sanctions following Russia's invasion of Ukraine (see also Section 3.3.3).

NCAs also rely on data to inform their decisions with respect to upcoming EU policy changes.

3.3 ESMA

Data reported under EMIR, SFTR, MiFIR, SR, AIMFD and MMFR supports a wide spectrum of ESMA's mandates. It is used for markets monitoring, macro-level research, policymaking, supervision, and supervisory convergence. ESMA makes regularly available various publications that provide context as to the extent of usage of the underlying data. The following sub-sections provide examples of such publications.

---

10 Brokers' margins in the French Bond Market, AMF
11 Retail Investors Activity and Standard Profiles, AMF
12 MMF Reporting dashboard and AIFM Reporting Dashboard (CSSF), Report on alternative investment funds (Norwegian FSA), French Money Market Trends (AMF), Funds AuM and NAV (Finnish FSA), Liquidity Stress Testing of Maltese Retail Investment Funds (MFSA)

13 EU non-bank Financial Intermediation Risk Monitor 2023, ESRB
14 See for example report published by the AFM assessing quality of execution in the Netherlands: https://www.afm.nl/~/profmedia/files/nieuws/2022/afm-paper-assessment-execution-quality-pfof-venues.pdf

3.3.1 Trends, Risk and Vulnerabilities report (TRV)

The TRV is ESMA's flagship report monitoring market-level risks to consumers, market integrity and financial stability. It provides a comprehensive overview of key trends and risks in Europe[15]. EMIR, MiFIR (FITRS and weekly positions[16]) and SFTR are among key data sources used to perform analysis of financial and securities financing markets. The report is published semi-annually.

3.3.2 Market reports

Besides the TRV, ESMA regularly publishes market reports with extensive and granular statistical breakdowns and analyses.

In 2023, ESMA published market reports for the first time on Money-Market funds,[17] on securitisation market[18] and on credit ratings[19].

ESMA also published a market report on Costs and Performance of EU Retail Investment Products (UCITS, AIFs and SRPs)[20], a market report on EU Derivatives Markets relying on EMIR data[21], a Market Report on EU Alternative Investment Funds[22] relying on AIFMD data and a market report on SFTR[23].

3.3.3 Detection of transactions on sanctioned instruments

In the context of its DRSP supervisory mandate, ESMA identified certain transactions, made publicly available through APAs, that were potentially subject to sanctions following the Russian invasion

of Ukraine. ESMA investigated the matter using the MiFIR transaction data and identified further transactions as potentially falling under the scope of sanctioned instruments. ESMA shared the identified information with relevant NCAs. Based on the NCAs feedback, several supervisory actions were taken.

3.3.4 Market Correction Mechanism

In March 2023, ESMA published an Effect Assessment[24] on the introduction of the Market Correction Mechanism (MCM) as required by the MCM Regulation[25]. ESMA relied on the analysis of natural gas derivatives market transaction data from EMIR and MiFIR (FITRS) to measure immediate effects of this new regulation on natural gas derivatives market trading in Europe, notably the risk of migration to OTC trading and to non-EU venues.

ESMA also developed a monitoring tool enabling the swift production of similar reports required to be published if the activation of the MCM becomes imminent.

3.3.5 Energy Market

The energy crisis which unfolded in 2022, notably the skyrocketing natural gas prices in March and August, brought public scrutiny on the EU gas market and prompted ESMA to conduct extensive research on the functioning of this relatively niche market. This led to the publication of two studies based *inter-alia* on EMIR data (1) on the structure and functioning of EU natural gas derivatives markets, and potential risks for

---

[15] TRV No. 1, 2023: ESMA Report on Trends, Risks and Vulnerabilities No. 1, 2023
TRV No 2, 2023: ESMA Report on Trends, Risks and Vulnerabilities No. 2, 2023
16 Public data on positions held in commodity derivatives and emission allowances derivatives, available in ESMA Register
17 ESMA Market Report – EU MMF market 2023
18 ESMA Market Report – The EU securitisation market – an overview
19 ESMA Market Report – The EU Credit Ratings market 2023

20 ESMA Market Report – Costs and Performance of EU Retail Investment Products 2023
21 ESMA Market Report – EU Derivatives Markets 2023
22 ESMA Market Report – EU Alternative Investment Funds 2023
23 ESMA50-524821-3147 EU Securities Financing Transactions markets 2024 (europa.eu)
24 Effects Assessment of the impact of the market correction mechanism on financial markets
25 Regulation (EU) 2022/2578 establishing a market correction mechanism to protect Union citizens and the economy against excessively high prices

financial stability[26]; (2) on the record surge in prices in European natural gas futures markets in August 2022[27]. In addition, ESMA published an article on EU energy derivatives markets in the Bank of Spain "Financial Stability Review"[28], based on EMIR and MiFIR data.

3.3.6 Direct supervision

Thanks to the granular information allowing to obtain varied analyses at entity level, ESMA makes extensive use of the data for the purposes of its direct supervisory mandates (trade repositories (TRs), securitisation repositories (SRs), approved reporting mechanisms (ARMs), approved publication arrangements (APAs) and credit rating agencies (CRAs)) as well as to support NCAs supervisory mandates of reporting participants.

In addition, ESMA makes use of EMIR data in the supervision of Tier 2 third-country CCPs to identify and monitor relevant risks, analyse market developments, and produce supervisory insights.

In its capacity as supervisor of CRAs, ESMA developed a range of internal monitoring analyses to support its strategic objectives. Quantitative information on ratings issued or endorsed in the EU is regularly used to define the scope and coverage of supervisory activities, detect potentially concerning patterns, feed the risk assessment process, and inform various stakeholders on the evolution of the ratings' market. ESMA also publishes a CRA Market Share Report[29], including information about CRAs' rating coverage in the EU by asset class.

In its role as the supervisor of administrators of EU critical benchmarks and of third-country administrator recognized in the EU, ESMA frequently relies on evidence coming out of regulatory data sets. The main data sets being used for those workstreams is EMIR with the goal to observe outstanding derivative amounts and trade activity of specific benchmark(s). Beforehand the data is refined and scoped using the reference data set of FIRDS which essentially provides a set of identifiers (mostly ISINs) that can be used to filter out relevant instruments.

For example, ESMA assesses at regular intervals whether benchmarks are deemed to be classified as critical benchmarks due to their usage within the Union. The classification is defined by breaching certain volume thresholds which are in turn defined in Benchmark Regulation (BMR)[30]. Further regulatory data is used during the recognition process to establish the usage of third country benchmarks to be recognised within EU.

3.3.7 Data-driven Policy

ESMA frequently relies on data while developing policy proposals or responding to ad-hoc requests from the European Commission, for example to measure the impact of a given provision or to assess the scale of a specific issue.

For example, ESMA recently provided an assessment of the options proposed by the European Commission, for the upcoming choice of identifiers for OTC derivatives, using EMIR data (see ESMA's response[31] to the consultation[32]).

---

26 EU natural gas derivatives markets: risks and trends
27 The August 2022 surge in the price of natural gas futures
28 EU Energy Derivatives Markets : Structure and Risks
29 CRA Market Share Report
30 See article 20 of Regulation (EU) 2016/1011 of the European Parliament and of the Council.

31 Response to public consultation – EC targeted consultation on OTC derivatives identifier for public transparency purposes
32 Targeted consultation on OTC derivatives identifier for public transparency purposes

ESMA's report[33] on the clearing obligation and derivative trading obligations in the context of the benchmark transition relied on EMIR data to assess the liquidity (and shift of liquidity) of certain OTC interest rate derivatives and determine which classes would be eligible to those obligations.

In its report[34] on the implementation and functioning of intra-day volatility mechanism, ESMA also used MiFIR data (FITRS) to provide an overview of trading activity in natural gas and electricity derivatives on EU trading venues.

ESMA is also investigating the development of investments performed via neobrokers, mainly by retail investors, and in this context analysed trading volumes on the relevant venues using MiFIR data (FITRS). The outcome of this analysis may be published at a later stage.

Using AIFMD data, ESMA assessed the risk posed by leveraged AIFs in the EU finding that the implementation of the ESMA Guidelines on Article 25 of AIFMD[35] is improving the monitoring of the EU AIF sector. At the national level, NCAs generally managed to overcome existing AIFMD data gaps by using additional data sources and other information from fund managers to have an accurate view of the risk in their jurisdiction[36].

ESMA investigated the results of the stress tests scenarios of MMFs, as defined in the ESMA guidelines on MMF Stress tests, sent by managers of MMFs to NCAs, and then to ESMA, to identify any potential vulnerabilities of MMFs[37].

3.3.8 Data-driven supervisory convergence

ESMA used data as an important input to prioritise and shape supervisory convergence activities. Notably, data - included in the form of TRV analyses and Markets reports - are used to inform the prioritisation of supervisory convergence work in those areas posing potentially highest risks for investors protection, financial stability, and orderly markets. ESMA used aggregated transaction data to inform convergence workstreams in the Voluntary Supervisory Colleges, that cover certain large investment services and investment management firms. In addition, data were used to target and focus peer reviews (such as the upcoming peer review on the supervision of the STS securitisation requirements[38]).

---

33 Final report on the clearing and derivative trading obligations in view of the 2022 status of the benchmark transition
34 Final Report on the implementation and functioning of the intra-day volatility management mechanism
35 Guidelines on Article 25 of Directive 2011/61/EU

36 ESMA TRV Risk Analysis – Assessing risk posed by leveraged AIFs in the EU
37 ESMA TRV Risk Analysis – Stress testing MMFs in the EU – First evidence from fund reporting
38 ESMA TRV Risk Analysis – The EU securitisation market – an overview

4 Key data quality developments

The following sub-sections provide an overview of key developments as well as supervisory actions aimed at improving the quality of data in the scope of this report.

4.1 EMIR and SFTR data

4.1.1 Preparations for the go-live of the revised technical standards under EMIR REFIT

Pursuant to the mandates set out in EMIR REFIT[39] ESMA developed and published in December 2020 a set of draft technical standards on reporting, data quality, data access and TR registration. Following the publication of these technical standards in the Official Journal of the EU in October 2022[40], ESMA finalised its work on the additional guidance and technical documentation on reporting which was published in December 2022. This package[41], which included Guidelines on reporting, ISO 20022 schemas, validation rules, and reconciliation tolerances, was provided to assist the industry in the implementation of the revised rules ahead of their date of application set for 29 April 2024.

In the context of the preparations for this go-live date, ESMA maintained during 2023 continuous interactions with the TRs, industry associations and other stakeholders to be able to swiftly receive and respond to any outstanding questions. This process was highly valued and, in addition to providing the helpful assistance, it allowed to early detect certain instances where the technical documentation needed to be improved or adapted. ESMA decided to implement such fixes and published the updated ISO 20022 schemas and validation rules in September 2023. Furthermore, addressing requests from the stakeholders, ESMA prepared and published at the same time also a mapping table providing clarifications on the equivalence between the reportable elements under the different versions of the EMIR technical standards as well as in the corresponding ISO 20022 schemas.

Finally, ESMA finalised also the review of the Guidelines[42] on positions calculations to adjust them to the reporting under EMIR REFIT. These Guidelines provide clarifications to trade repositories (TRs) regarding the time of calculations, the scope of the data to be used in calculations and the calculation methodologies. They are important to ensure that the position data provided to the authorities is computed in a consistent and reliable manner. The Guidelines will become applicable in October 2024.

4.1.2 Follow-up to the Peer Review into supervisory actions aiming at enhancing the quality of data reported under EMIR

In 2023 ESMA also took stock of the work done by NCAs, and ESMA in its role as direct supervisor of TRs, to address the findings and recommendations of the 2019 peer review on the supervision of EMIR DQ. The

---

39 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0834&from=EN

40 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2022:262:FULL&from=EN

41 All documents are published in EMIR Reporting on the ESMA homepage.

42 Final Report - Guidelines on position calculation under EMIR

report43 identifies that ESMA and NCAs have carried out intensive and concerted supervisory efforts to make structural, long-lasting improvements in this area.

The report identifies that at national level the NCAs have introduced data quality dashboards, undertook more granular EMIR data quality checks and made use of their enforcement powers by taking actions against counterparties in relation to data quality issues.

4.1.3 EMIR data quality engagement framework

ESMA's strategic approach to supervision of data quality under EMIR and SFTR relies on two pillars: a comprehensive dashboard to monitor data quality (Data Quality Indicators – DQIs), and the NCA's data sharing framework, which provides a clear procedure for exchange of information and follow-up on data quality issues that significantly impact the quality of reporting and the analysis at EU level (see sections 4.1.5). The DQIs coupled with the NCA's data sharing framework continued to be used for data-driven supervisory actions in 2023, which led to further observable improvements in the data.

In the context of the analysis of Contracts for Difference (CFDs) derivatives in the EMIR Trade State Reports (TSRs), ESMA identified an entity having consistently an implausibly high number of outstanding CFDs. Looking at the TSRs reported between January and March 2023, ESMA observed for the entity in question around 1 million records for CFD contract type out of a total of around 9 million CFD records (~12%) in the EU, for a total Notional of around EUR 170 billion. ESMA brought this matter to the attention of the relevant NCA under the framework for provision of data and follow-up

on EMIR data quality issues. Following the NCA's outreach to the concerned counterparty and their confirmation that the reported values were incorrect, a material improvement in the data was observed (see Chart 1).

Chart 1
Entity's CFDs overreporting
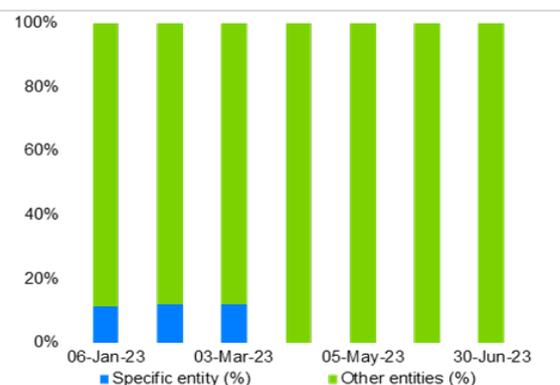
Note: The number of records in the EMIR Trade State Report reported by this specific entity with CD (Contract for Differences) contract type as a share of the total number of records with CD contract type is being plotted.
Sources: ESMA EMIR Trade State Reports

ESMA has also identified a significant issue related to the reporting of valuation updates, which are mandatory for financial counterparties and non-financial counterparties exceeding the clearing threshold. Given the importance of this information for financial stability analyses, ESMA monitors and flags derivatives reported with outdated valuations. In this context, ESMA has identified an entity exhibiting since July 2023 a significant number of derivatives with late valuations: around 640 thousand records where the valuations were late out of a total of around 2 million records with late valuations (~32%) in the EU (see Chart 2). ESMA brought this matter to the attention of the relevant NCA twofold. Firstly, it was shared as part of the regular dissemination of DQI 8 (late valuations; shown in Chart 8 in section 4.1.5.). Secondly, a data quality issue notification has been dispatched to

---

43 https://www.esma.europa.eu/sites/default/files/2024-04/ESMA42-2004696504-7771_Follow-up_report_to_EMIR_data_quality_peer_review.pdf

concerned NCA in which ESMA shared the findings outlined above. Under the agreed framework NCAs need to investigate significant issue(s) and contact the entity to resolve the data quality problem. This process will result in a timely resolution of this significant issue.

Chart 2

Entity's outdated valuations

Note: The number of records with an outdated valuation reported by the specific entity as a share of the total number of records with an outdated valuation is being plotted. A valuation is considered outdated if the difference between the report as of date and the date being reported in the field valuation timestamp is greater than two days. Only Financial Counterparties, CCPs or Non-Financial Counterparties above the clearing threshold have to send valuation updates.
Sources:ESMA EMIR Trade State Reports

Another issue that ESMA is closely monitoring is the discrepancies in the notional values and the number of trades outstanding being reported by CCPs and their Clearing Members (CMs) for transactions between them. The importance of these reports cannot be overstated since these entities are an important part of the post trading infrastructure and therefore closely monitored by authorities. Following input received from the data users on this part of the data set, ESMA started an in-depth analysis and has identified key entities that cause a large portion of those discrepancies. These differences were brought to the attention of the NCAs. One specific notification related to significant worsening of the reporting quality between a CCP and CM, both supervised by the same NCA. This was done in the context of the dissemination of DQI 1 (difference in trades/positions reported) and DQI 2 (see Chart 8 and Chart 9 in section 4.1.5). According to the feedback received by the relevant NCA, the CM confirmed the issues

in reporting the field Maturity Date due to an IT incident as well as other minor issues, which were expected to be resolved by October 2023. The CCP responded that the majority of the problems communicated to them were either solved or not under their responsibility and promised the resolution of the rest of the problems also by October 2023. ESMA observed that the discrepancy in question seems to have stabilised in January 2024 (see Chart 3), however further follow-ups are being considered with the aim of a further material improvement in the data quality with this respect.

Chart 3

A CCP's notional discrepancies with a Clearing Member

Note:The absolute difference between the reported value for the field Notional (EUR equivalent, in trillions) by a CCP and by a Clearing Member is plotted on the left-hand-side. The absolute difference between the number of trades being reported by that CCP and that Clearing Member is plotted on the right-hand-side.
Sources: ESMA EMIR Trade State Reports, ECB EUR fx rates

4.1.4 SFTR data quality engagement framework

The 2022 Report on Quality and Use of Transaction data highlighted the improvement in the quality of securities lending/borrowing data, as a follow-up to the actions taken by ESMA and the relevant NCA to address the implausibly high loan values reported by some entities. In the follow up analysis it was discovered that one entity was still overreporting in the first half of 2023. Specifically, it reported a loan value for securities lending which constituted 55% of all loan values in the data set, an unreasonable amount considering the entity

type or even one single entity. This very high share indicated a severe misreporting on which basis ESMA contacted the relevant NCA, who followed-up with the concerned counterparty and confirmed that the reported values were incorrect. The entity provided their resolution plan for the problem and the corrective actions resulted in a material improvement in the data (see Chart 4).

Chart 4

Entity's inflated loan values
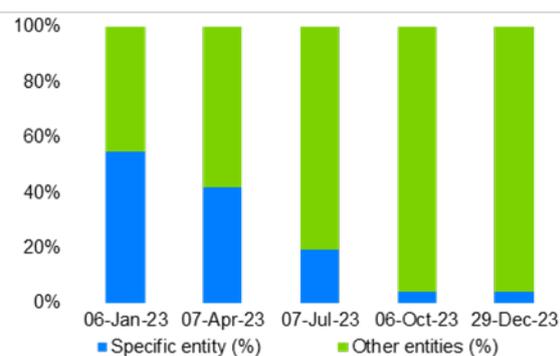
Note: The loan value (EUR equivalent) in the SFTR Trade State Report reported by this specific entity as a share of the total loan value (EUR equivalent,no distinction between counterparty side is made, calculation is subject to double-sided reporting, no handling of outliers is applied) is being plotted.
Sources:ESMA SFTR Trade State Reports, ECB EUR fx rates

Apart from securities lending/borrowing loan values, ESMA has been also monitoring the repo principal amounts and identified constant increase and significant concentration in the amounts reported by a specific entity that reached its peak at the end of November 2022 at around EUR 3 trillion, which constitutes a very large and unreasonable amount. In addition, throughout their reporting and for most records, this entity was populating the field 1.14 Tri-party Agent with the same LEI as that of the field 1.3 Reporting Counterparty, which is misreporting, as the LEIs in these two fields are not expected to be the same. ESMA has communicated these matters to the relevant authorities and for the former issue an improvement in the data has been observed (see Chart 5), while for the latter the NCA's feedback is expected to be received.

Chart 5

Entity's repo principal amount %
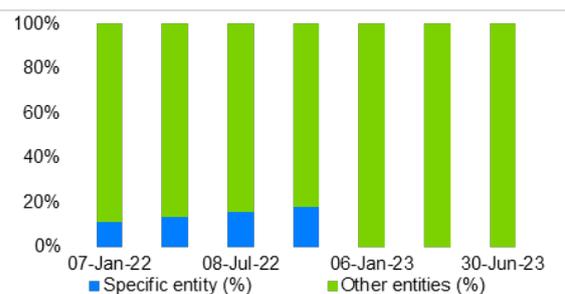
Note: The repo principal amount (EUR equivalent) in the SFTR Trade State Report reported by this specific entity as a share of the total repo principal amount (EUR equivalent, no distinction between counterparty side is made, calculation is subject to double-sided reporting, no handling of outliers is applied) is being plotted.
Sources:ESMA SFTR Trade State Reports, ECB EUR fx rates

4.1.5 EMIR DQIs and dissemination of the results to NCAs

In line with the agreed framework, the relevant authorities were provided with granular information on DQIs that exceeded the established threshold and undertaken supervisory activities during the calendar year of 2023. In the previous iteration of the data quality framework, five DQIs were disseminated based on their significance. The scope of the exercise has increased with eleven DQIs being disseminated in the latest iteration to cover a broader set of data quality indicators (listed in annex 6.1.1). For brevity and continuity of the last edition of this report an update is provided for the 5 DQIs disseminated also in 2022 highlighting the progress achieved by the combined action of NCAs and ESMA across the EU.

EMIR DQI 1 quantifies discrepancies in the number of reported outstanding derivatives at the trade level between two counterparties engaged in trading. Such discrepancies pose challenges to authorities in obtaining an accurate understanding of entities' relevant exposures. Chart 6 illustrates the evolution of EEA30-level results. Discrepancies fluctuated, reaching a peak of 26.1% in September 2021, but a positive trend of gradual decrease has been observed since then. Chart 6 provides insights into the

gradual reduction of discrepancies, with the latest recorded percentage at 11.5% as of December 2023, indicating continued positive developments in resolving this mismatch at counterparty level reported information.

Chart 6

EMIR DQI 1 - Difference in trades reported
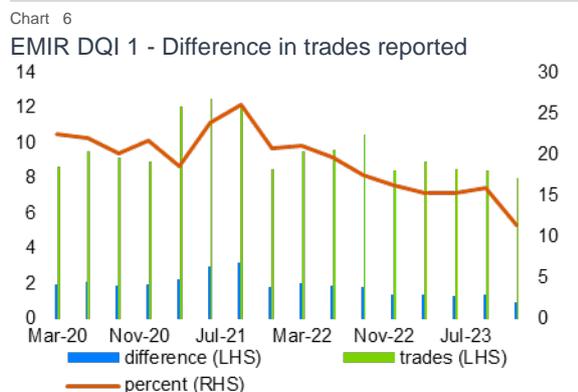
Note: EMIR DQI 1 - LHS (Millions of records): Total outstanding pairable trades and the sum of absolute differences in reporting between two parties. RHS (%): Difference as a percent of outstanding trades. Sources: EMIR Trade State Report and ESMA calculations

In Chart 7, EMIR DQI 2 highlights the discrepancies in the reported outstanding derivatives positions between two counterparties subject to double reporting. Like DQI 1, these discrepancies pose challenges to authorities in obtaining an accurate understanding of entities' relevant exposures. The data reveals a consistent decrease in the percentage of errors over time, with some minor fluctuations. The latest figures, as seen in Chart 7, showcase a significant reduction in discrepancies, with the percentage of errors reaching a low of 6.5% as of December 2023. This trend reflects continuous improvement in addressing and minimizing reporting errors related to outstanding derivatives positions between counterparties and underlines the efforts of the NCAs and ESMA in resolving this data inconsistency.

Chart 7

EMIR DQI2 – Difference in positions reported

Note: EMIR DQI 2 - LHS (Millions of records): Total outstanding pairable positions and the sum of absolute differences in reporting between two parties. RHS (%): Difference as a percent of outstanding positions. Sources: EMIR Trade State Report and ESMA calculations
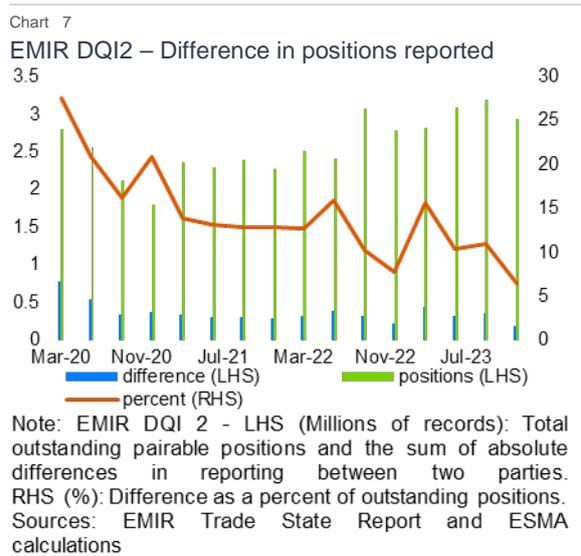
In Chart 8, the EMIR DQI 8 is depicted which shows the number of outstanding derivatives with timely valuations and late valuations. The absence of up-to-date information on the valuation of outstanding derivatives limits authorities' capacity to reliably monitor exposure of key market participants which is especially crucial during crisis situations were supervisors need obtain a clear picture within short time spans. Regarding the developments it can be observed that the percentage of late valuations demonstrates a robust downward trend. These figures indicate a substantial reduction in the percentage of late valuations, reaching a low of 7.3% as of December 2023. This consistent downward trend signals the effective efforts in improving data quality in EMIR, enhancing the usability of valuation information critical for many data users.

Chart 8

EMIR DQI 8 – Late valuations
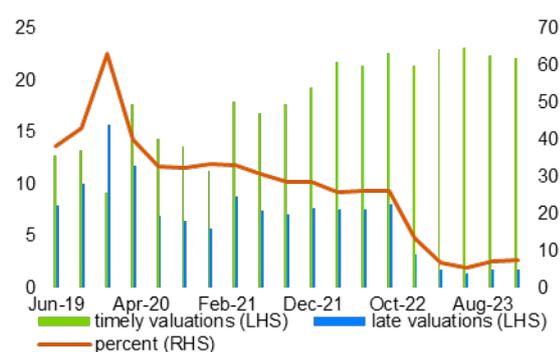
Note: EMIR DQI 8 - LHS (Millions of records) Timely and late valuations. RHS (%): Percent of records with late valuations out all records.
Sources: EMIR Trade State Report and ESMA calculations

Chart 9

EMIR DQI 9 – Missing or abnormal maturities
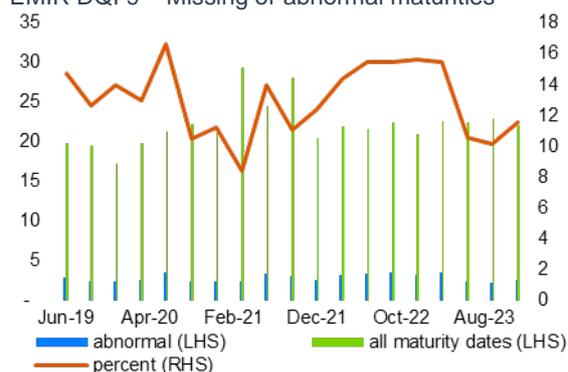
Note: EMIR DQI 9 - LHS (Millions of records): Missing or abnormal vs all maturity dates. RHS (%): Percent of missing or abnormal maturities out of all maturities.
Sources: EMIR Trade State Report and ESMA calculations

In Chart 9, EMIR DQI 9 illustrates the count of outstanding derivatives with missing or abnormal maturities, specifically abnormal maturity is defined for this indicator as derivative that exceed 51 years. The absence or inaccuracy of information regarding maturity dates can result in a flawed assessment of exposures by either counting expired derivatives as outstanding or vice versa. This also introduces uncertainty in estimating the future evolution of exposures. The percentage of outstanding derivatives with missing or abnormal maturities has exhibited fluctuations within a relatively narrow range of approximately 10% to 16%, without a discernible trend. ESMA will continuously monitor these trends, and if there is no improvement soon, it will collaborate with the NCAs to conduct further follow-up with the reporting counterparties. The latest figures depict the persistent fluctuation in the percentage of outstanding derivatives with missing or abnormal maturities, emphasizing the need for ongoing monitoring and potential intervention to enhance reporting accuracy and reliability.

In Chart 10, EMIR DQI 10 illustrates the count of outstanding derivatives with missing valuations. Like EMIR DQI 8 (late valuations) the absence of data in this crucial field directly impacts authorities' ability to monitor exposures accurately. The percentage of outstanding derivatives with missing valuations has shown fluctuations but with an overall downward trend. Starting at a relatively high level of 23.8% in 2019, the percentage settled at an average of 14.3% by the year 2022. This general trend reflects a reduction in missing valuations, emphasizing the effectiveness of the new risk-based approach. The latest figures depict the fluctuation in the percentage of outstanding derivatives with missing valuations, showcasing a notable reduction over time. The steady decline highlights the efficacy of the risk-based approach, contributing to improved data completeness and reliability for monitoring exposures.

Chart 10

EMIR DQI 10 – Missing valuations

Note: EMIR DQI 10 - LHS (Millions of records): Missing valuation vs all records. RHS (%): Percent of missing records valuation out of all records.
Sources: EMIR Trade State Report and ESMA calculations
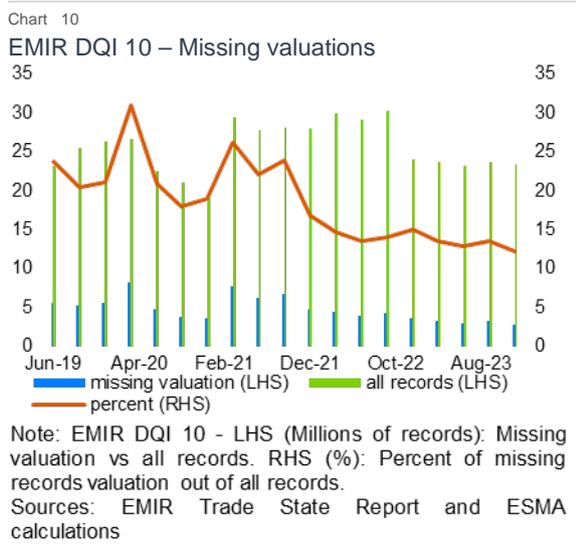
Overall, there has been a positive trend in the absolute numbers of impacted reports across the presented DQIs. Notably, DQI 1 reveals a gradual decrease in discrepancies in reported outstanding derivatives between counterparties, with the peak at 26.1% in September 2021 reduced to 11.5% by December 2023. Similarly, DQI 2 showcases a significant reduction in discrepancies in reported outstanding derivatives positions, reaching a low of 6.5% by December 2023.

Furthermore, DQI 8 demonstrates a consistent decrease in the percentage of outstanding derivatives with late valuations, dropping from 43.2% in September 2019 to 7.4% in December 2023. In the case of DQI 9, there is a persistent fluctuation in the percentage of outstanding derivatives with missing or abnormal maturities, remaining within a range of 10% to 16%. Lastly, DQI 10 indicates an overall downward trend in the percentage of outstanding derivatives with missing valuations, decreasing from 23.8% in 2019 to 12.2% by December 2023.

A linkage between the feedback received from the NCA and the improvement of the

reporting has also been confirmed at entity level. In this exercise, the relevant NCAs reached out to 73 counterparties on 169 reporting issues[44]. As of end September 2023 the NCAs confirmed resolution of the reporting problem in 34 cases – out of which in 20 cases a substantial improvement has been confirmed in the data. Among 116 cases for which the resolution has not yet been confirmed, a substantial[45] improvement has been observed in 15% of the cases. This partially positive outcome may be explained by various factors such as first impacts of the remediation actions (not yet reported to ESMA). It is worth pointing out that there is a linkage between the level of activity of counterparties from a given Member State and the number of detected significant data quality issues.

Chart 11

Number of data quality issues per observed improvement in the data and country of the reporting counterparty

Note: The country is determined on the basis of country of the reporting counterparty. For certain DQIs, such as discrepancies in the number of trade/positions, the error cannot be assigned ex-ante to one of the counterparties in the pair (and a specific jurisdiction), thus the follow-up may require engagement with both counterparties. Number of data quality issues per each NCA jurisdiction, broken down by the observed improvement in the data. TR issues and false positives were excluded. Countries included in the chart are those where a significant data quality issue was identified.
Sources: NCAs feedback and ESMA calculations

---

44 Some entities qualified for the follow-up under more than one DQI. Additionally, some DQIs require follow-up from both counterparties (and thus potentially an engagement from multiple NCAs in case of cross border issues) since the responsibility for a given issue cannot be clearly assigned in all cases. The latter aspect is relevant for DQI1 and DQI2.

45 'substantial' improvement has been counted when the number of misreported derivatives decreased by at least 50% between the beginning and the end of the exercise (May 2023 – September 2023).

Chart 12

Number of data quality issues per observed improvement in the data and status of the issue
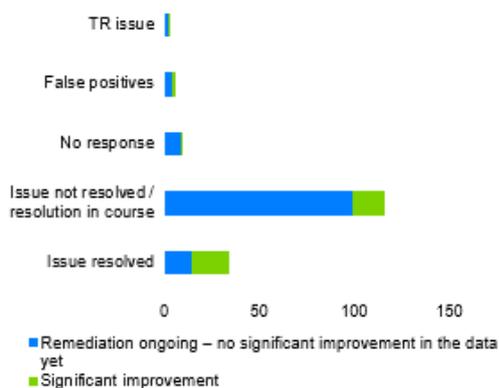
Note: NCAs responses on the resolution status of the issues flagged through the DQIs exercises.
Sources: NCAs feedback and ESMA calculations.

4.1.5.1 Misreporting of notional and margins under EMIR

EMIR and SFTR data are heavily used to estimate and monitor outstanding notional/monetary amounts across various markets, market participants and instruments. Correct reporting of those by counterparties is therefore critical to obtain an accurate picture. Due to significant retail exposure, contracts for difference (CFDs) have been subject to frequent analysis by ESMA. Chart 13 shows the impact of outlier removal/treatment on the estimates of notional figures. More specifically, the chart shows a distribution of gross notional (bought and sold) by top 17 brokers in Europe in 2022 and share of notional after vs. before treatment.

While certain brokers tend to provide accurate figures (those with share close to 100% after vs. before removal) several brokers report highly implausible values (outliers) to the extent that after outlier treatment their share of total notional is at or close to 0%.

ESMA shared the relevant information and is following up with NCAs supervising brokers with significant reporting issues.

Chart 13

Outliers reported in CFD notional
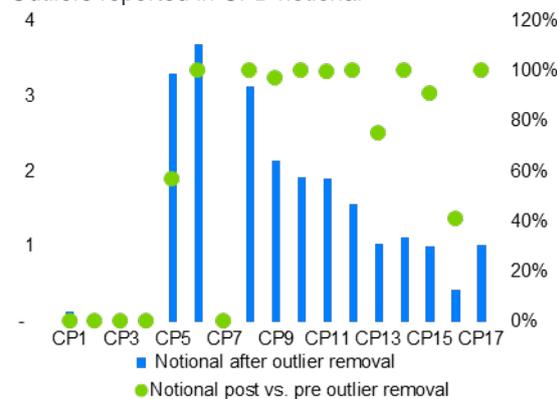
Note: The bars show gross (buy and sell) notional post outlier treatment traded by top 17 brokers during 2022. The dots show a ratio of post vs. pre outlier removal notional. Dots near or at 0% indicate that almost the entire volume of reportd by the given broker was removed due to presence of outliers. Dots close to 100% indicate that there were not outliers reported by that broker.
Sources: EMIR Trade Activity Reports

In the context of EMIR DQI 19, which measures margins inconsistencies in reporting between two counterparties, it is crucial to note that outliers are one of the factors which may lead to elevated results observed. For instance, the figure for December 2022 is notably elevated at 273.6%, primarily due to the presence of outliers that skew the statistical measure. This emphasizes the importance of understanding the context and potential outliers when interpreting the margin discrepancy percentages.

The observed figures over various reporting periods indicate challenges in margin reporting within EMIR. It is important to recognize that DQI 19 sheds light on issues within margin reporting and serves as a valuable indicator for identifying areas of improvement. As part of the ongoing efforts within EMIR Refit, more work is underway to address the challenges associated with inconsistent margin reporting. This includes refining methodologies, improving data quality in other dimensions (DQI 14 – Outliers), and implementing measures to mitigate the impact of outliers, which is

expected to have additionally a positive impact on margin reporting under EMIR.

EMIR DQI 19 – Margins consistency

Note: EMIR DQI 19 - Margins discrepancy between two counterparties over margins received by the reporting counterparty (Percent scale)
Sources: EMIR Trade State Report and ESMA calculations
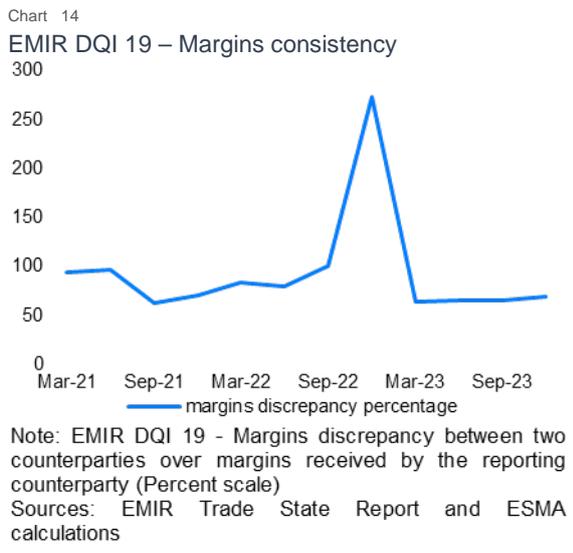
4.1.6 EMIR regulatory access filtering

When providing data to the authorities, TRs need to apply filtering rules at record level to make the data available to authorities. These rules are based on their respective mandates. In this context it is important to avoid that an authority receives data which it is not entitled to (overreporting) and to ensure that each authority receives all the data that it requires to fulfil its mandates.

Following the first iteration of the project in 2022, ESMA completed the second iteration in 2023 based on the same methodology and with an extended sample of contributing authorities. Compared to the previous analysis, the last iteration considers all previous filtering criteria based on specific NCA mandates as well as the full set of filtering conditions specified by EMIR Q&A 37, which became applicable as of 21 May 2021. ESMA integrated FIRDS data into this analysis to evaluate the additional second filtering condition of Q&A37[46].

According to the key findings of this second iteration of the project, the overreporting from

TRs to the authorities in the sample (~18.5mln records) was found to be more pronounced compared to the underreporting (~584k records). Regarding NCAs, the incorrect / insufficient implementation of EMIR Q&A 37 appears to be the main root cause explaining the biggest discrepancies found among two of the TRs.

Outcomes of the assessment (anonymized).

ESMA communicated the findings to the TRs and is following up with the definition and implementation of remedial action plan. ESMA will be closely monitoring the remediation of these issues by the TRs and at the same time is planning to perform the next iteration of this analysis during 2024.

In the next iteration, GLEIF Level 2 data will be used further to determine the authorities' access on a more granular level. This becomes important as under EMIR REFIT, TRs are expected to implement a new criterion: the subsidiaries criteria (Article 2 par. 10 & 11 of the amended EMIR RTS on data access). It is therefore of paramount importance that the coverage in the relevant reference data is sufficient, to ensure that access to the derivative records is not compromised.

---

46 According to EMIR Q&A37 an NCA has further access to the record if that NCA is the Relevant Competent Authority (RCA) of the reported ISIN of any of the individual

components of the underlying basket. The RCA is determined in the FIRDS database.

4.2 MiFIR data

Data Reporting Services Providers (DRSPs) are entities introduced by MIFIR[47], whose primary function is to enable investors and NCAs to receive accurate and timely market data. Based on the type of reporting service, MIFIR envisages the following categories of DRSPs:

- **Approved Reporting Mechanisms (ARM)**, receive transaction data from investment firms and transmit those to NCAs. Their main purpose is to facilitate the reporting for investment firms and in doing so they also ensure the completeness and accuracy of transaction data for regulatory reporting and market surveillance. They are responsible for verifying the accuracy of the data they receive and implementing appropriate measures to ensure the reliability and security of their systems. They play an important role in ensuring the transparency and integrity of financial markets by providing regulators with a comprehensive view of financial instrument transactions.

- **Approved Publication Arrangements (APA)**, collect and publish post-trade OTC transaction data under MiFIR. Their main purpose is to provide market participants with visibility of the liquidity of financial instruments markets. They play a critical role in ensuring market transparency by providing near real-time information about market conditions and prices.

- **Consolidated Tape Providers (CTP)**, will provide a consolidated view of market data from multiple trading venues and APAs under MiFIR. They will collect real-time data and consolidate it into a single, comprehensive view of market activity and prices.

While there is currently no consolidated tape provider, one of the main objectives of the MiFIR review[48] is to facilitate the emergence of several CTPs (one post-trade for bonds, one pre- and post-trade for shares and ETFs, one post-trade for OTC derivatives). In this context, ESMA is expected to deliver several regulatory technical standards related to the establishment of the CTPs, and to proceed with the selection and authorisation of the CTPs. The selection procedure for the first CTP (on bonds) should be launched in 2024.

Following the results of the assessment using complete 2022 data, ESMA supervised in 2023 nine different DRSPs[49], seven with an APA license and six with an ARM license. The ARMs supervised by ESMA account for 99.3% of the transaction reporting going through ARMs in the EU. On 13 February 2024 ESMA published its decision to withdraw the licence of Euronext as ARM and as APA, at the request of the entity[50].

4.2.1 ARMs supervision

The ARM reporting across the EU displayed substantial disparities. In certain countries, there is no reporting through ESMA's supervised ARMs, while in others, it comprises up to 98% of received transactions.

---

47 The definition of DRSP can be found in MIFIR – Article 2 points (34) to (36a)
48 The regulation amending MiFIR should be published in the official journal in March 2024. Latest version available here
49 ESMA published in 2022 a news item announcing the list of DRSPs to be directly supervised. Further information

regarding the full list of DRSPs authorised in the EU can be found in the ESMA Registers

50 https://www.esma.europa.eu/press-news/esma-news/esma-withdraws-euronext-authorisation-data-reporting-service-provider-under#:~:text=The%20European%20Securities%20and%20Markets,Financial%20Instruments%20Regulation%20(MiFIR).

Chart 15

Number of monthly files
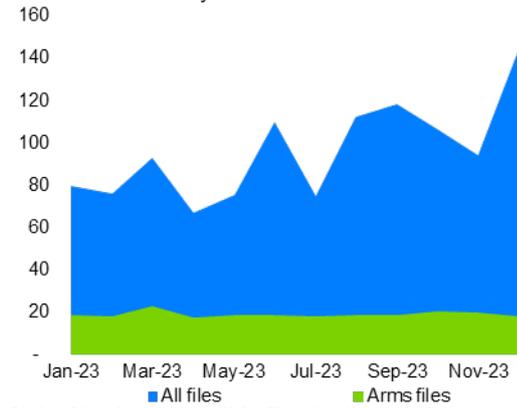
Note: Number of monthly files (in thousands, grouped by reception date
Sources: Transaction files received under MiFIR article 26

The total number of transactions[51] decreased by 2 billion to 6.87 billion in 2023, marking a significant 22.9% decline from 2022. Correspondingly, transactions from ARMs decreased by 1 billion to 3.75 billion, indicating a 20.7% reduction compared to the previous year.

In 2023, the data reveals a notable disparity in transaction patterns. Particularly in the first quarter, total reported transactions reached 2 billion, with ARMs accounting for 1.1 billion. This contrasts sharply with the subsequent three quarters, where the average transaction volume dropped to 1.6 billion overall and 875 million for ARMs (Chart 16).

Chart 16

Total number of monthly transactions
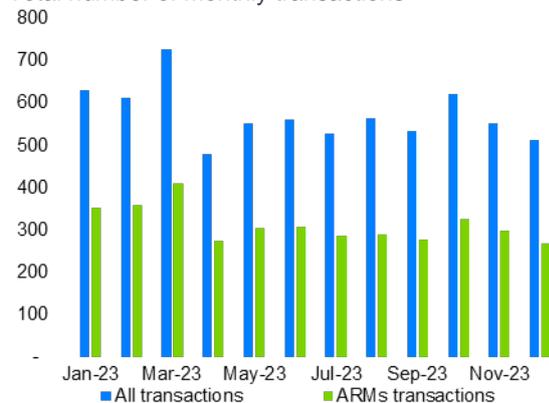
Note: Total number of monthly transactions (in millions), grouped by execution date
Sources: Transaction files received under MiFIR article 26

The percentage of transactions received from ARMs under ESMA's supervision increased from 53.1% to 54.6%. Notably, two ARMs reported more than 90% of total transactions, while the rest distributed the remaining volume more evenly (Chart 17).

Chart 17

Total number of monthly transactions per ARM
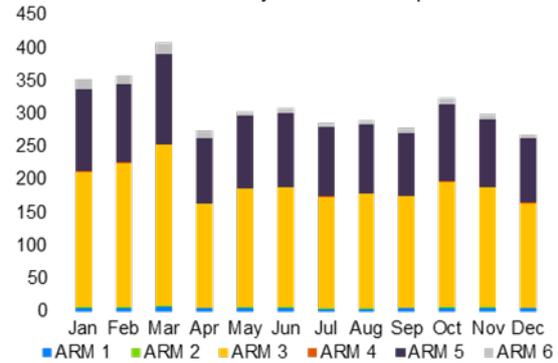
Note: Total number of monthly transactions (in millions) per ARM supervised by ESMA, grouped by execution date.
Sources: Transaction files received under MiFIR article 26

The rejection rate of files submitted by ARMs decreased by 46% compared to 2022, demonstrating commendable efforts by ARMs and reporting entities. The rejected ratio of transactions decreased overall across both NCAs and ARMs, underscoring ongoing efforts to improve data quality.

Chart 18

Monthly number of rejected files and rejected transactions ratio
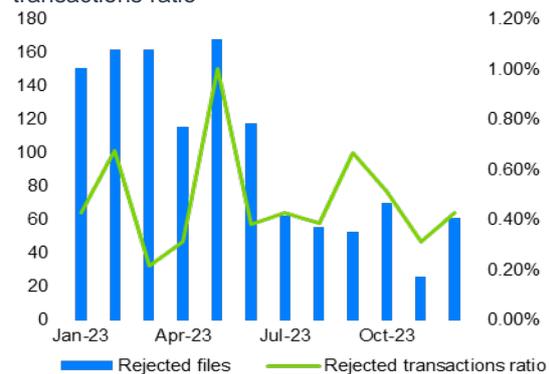
Note: Total number of monthly rejected files by NCA and total month rejected transactions ratio
Sources: Periodic reporting from supervised entities

---

[51] The number of transactions represents the total count of transactions received by ESMA's DRSP system, encompassing cancellations as well as any duplicate or chained transactions.

Additionally, DRSPs have been requested to provide aggregate monthly statistics on different APA's and ARM's metrics. This information allows ESMA to cross-check with other available datasets (e.g., transaction and transparency data) and to gather supplementary information not available from other sources (e.g., statistics on ingestion volumes, rejection rates).

All this information supports ESMA in the identification and execution of its data monitoring activities, which consist of periodic activities and ad-hoc reviews. ESMA monitors on an on-going basis the completeness, availability, integrity, and timeliness of transactions reported by ARMs.

4.2.2 APAs supervision

Furthermore, ESMA actively monitors the completeness, availability, integrity, and timeliness of transactions published by APAs. Periodic metrics received from supervised APAs offer insights into various aspects, including the rejection ratio of APAs, the number of transactions published per instrument type, the average time taken by APAs to publish from client submission, and the number of transactions published within the required timeline.

Chart 19 illustrates that the majority of APAs maintained a consistently low rejection ratio, except for one that experienced higher rejection rates. This specific APA successfully addressed reporting issues with its customers, subsequently returning the percentage of rejected transactions to normal levels since October 2023.

Chart 19

Monthly rejected ratio by APA

Note: Monthly rejected transactions ratio per APA (percentage)
Sources:Periodic reporting from supervised entities
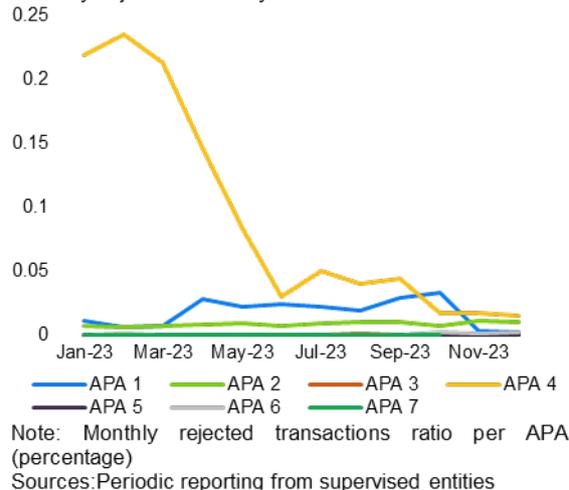
Chart 20 displays the monthly aggregate number of transactions published per type of instrument (non-equity, or Equity-like).

Chart 20

Number of monthly transactions by type of instrument

Note: Total number of monthly non-equit transactions (in millions) published per APA supervised by ESMA, grouped by publication date.
Sources: Periodic reporting from supervised entities
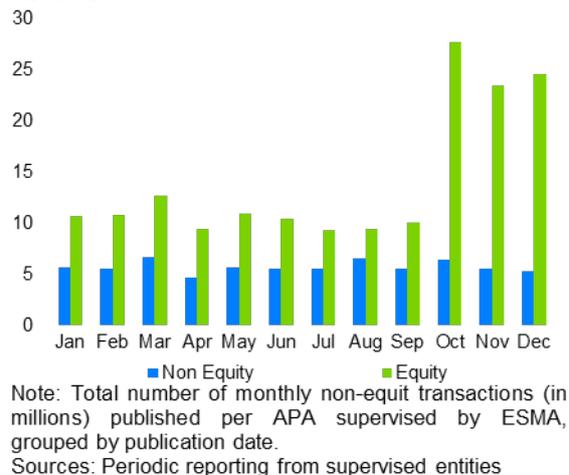
The volume of published transactions for non-equity instruments remains stable and consistent, three APAs account for more than 98% of published non-equity transactions.

Chart 21

Number of non-Equity transactions per month and APA
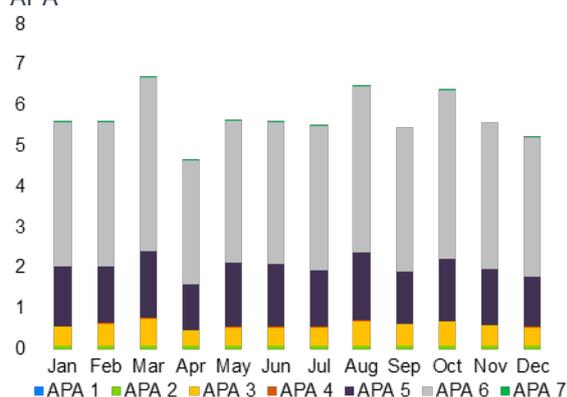
Note: Total number of monthly non-equity transactions (in millions) published per APA supervised by ESMA, grouped by publication date.
Sources: Periodic reporting from supervised entities

However, since October 2023, there was a significant increase of over 150% in the number of published equity transactions. This surge is mainly attributed to one APA's publication of equity fractional shares (Chart 22). Similarly, to non-equity transactions, three APAs account for 98% of the published equity transactions

Chart 22

Number of Equity transactions per month and APA
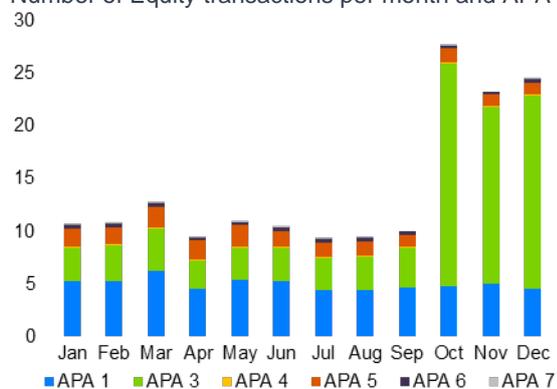
Note: Total number of monthly equity transactions (in millions) published per APA supervised by ESMA, grouped by publication date.
Sources: Periodic reporting from supervised entities

Additionally, ESMA noted significant improvements in the average time for executing entities to submit transactions to APAs compared to 2022. APAs also

sustained a low average time to publish transactions, aligning with regulatory requirements. Importantly, over 96% of non-deferred trades were made public within the required timeframe.

4.2.3 Comparison of MiFIR transaction and transparency data

In the context of ESMA's new supervisory mandates over the largest DRSPs from 1 January 2022, ESMA initiated an assessment of the consistency between transaction data reported by ARMs and transparency data published by APAs. The objective was the identification of discrepancies, investigation of the causes and remediation via supervisory or policy actions, in cooperation with NCAs.

Access and aggregation: ESMA accessed public APA data using web-scraping and found that more consistency in the way APA make the data publicly available would enhance its usability, when aggregating data from various APAs[52].

ESMA identified that the harmonisation of field naming conventions, the consistency in the reporting of flags, and the provision of daily aggregate CSVs would significantly improve the usability of published transparency reports.

To facilitate the work of users wishing to aggregate public APA data, ESMA is publishing sample code to enable easier access to the APA-published data in Annex 6.2. In addition, policy proposals to further harmonise APA data (for example the publication of flags) will be formulated in the context of the revision of Level 2 instruments following the MiFIR review[53].

Comparability: the challenges of reconciling transaction and transparency

---

52 For example, there is no harmonisation in APA data availability, publication frequency, registration requirements and column-naming convention

53 Upcoming consultation papers on the revision of the transparency RTS (RTS 1 for equity instruments and RTS 2 for non-equity instruments) expected to be published in 2024Q2

data primarily lies with two structural differences in those datasets, linked to their different policy purposes: the existence of execution chains in transaction data[54], and the broader scope of instruments covered by transaction reporting[55]. ESMA and NCAs are cooperating closely to enhance reconciliation methodologies.

Consistency: the subset of transactions common to both datasets exhibits reasonable level of price consistency. Machine learning techniques (clustering) allowed the identifications of misreporting patterns; some cases of misreporting have been notified to reporting entities and solved or in remediation.

Chart 23

Dispersion of log median price between the same instruments reported via MiFIR transaction and transparency data
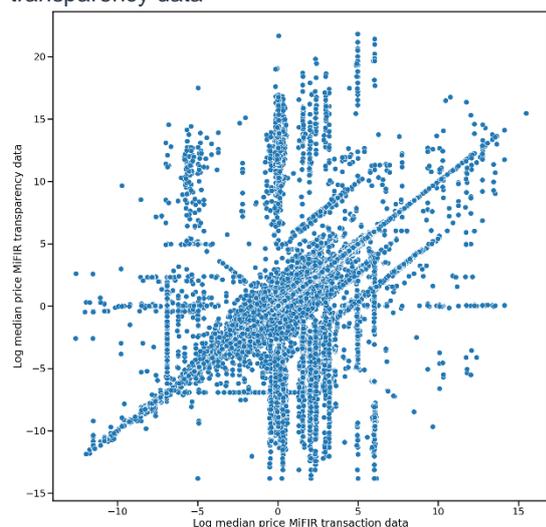
Note: Graph shows log median price reported on individual instruments and venues. Where the log median prices are equivalent between the two datasets the points scatter along 45-degree line. The further away the points are from the 45-degree line, the higher difference in the log median price between the two datasets. ESMA used clustering machine learning approach to identify features behind the clustering behaviour. Often the clusters appear to be driven by reporting by a specific executing and or submitting entity and or trading on a specific venue.
Sources: MiFIR transaction and transparency data reported in November 2022.

Textbox 1

Using machine learning clustering techniques to detect anomalies in MiFIR transaction and transparency data

In the context of the MiFIR transaction-trasparency data consistency project ESMA used open source mahine learning frameworks, namely the HDBSCAN.

HDBSCAN is a density-based clustering algorithm originally proposed by Campello, Moulavi and Sander[56]. HDBSCAN proved particularly useful in the context of ESMA's project due to its ability to detect clusters with highly variable densities.

HDBSCAN is based on a core distance metric called "mutual reachability desitance" which for two objects xp, xq is

$$max\{dcore(xp), dcore(xq), d(xp, xq)\}$$

where $d(xp, xq)$ refers to the "normal" distance according to the chosen metric, e.g. Euclidean distance. This approach separates sparse points from others by at least their core distance and makes the clustering more robust to noise.

ESMA leveraged open-source HDBSCAN implementation that can be found here: https://hdbscan.readthedocs.io/en/latest/index.html

---

4.2.4 MiFIR transparency data

MiFIR introduced pre- and post-trade transparency requirements for equities, bonds, structured finance products, emission allowances and derivatives. MiFIR foresees some exemptions to those rules and empowers competent authorities to waive pre-trade transparency under specific conditions. Some transactions also benefit from a deferred post-trade publication. In this context, ESMA collects MiFIR transparency data through direct submission by trading venues and APAs from all over Europe and supports competent authorities in their work through multiple publications.

In July 2023, ESMA published a Manual on post-trade transparency[57], providing guidance on how to apply the relevant MiFIR transparency obligations in a consistent manner to further increase *inter-alia* the quality of MiFIR transparency data reported to ESMA.

---

54 While transactions published by APAs are published only once (single sided, no chain), ARM transaction reporting include all the execution chains and are dual sided. Significant and complex filtering is necessary to obtain comparable datasets.
55 Transaction reporting and transparency reporting apply to instruments traded on a trading venue (ToTV). However, the scope of instruments subject to transaction reporting is

broader. It also includes instruments for which the underlying is traded on a trading venue (uToTV).
56 https://link.springer.com/chapter/10.1007/978-3-642-37456-2_14
57 Manual on post-trade transparency under MiFID II/MiFIR. The Manual covers both MiFIR transparency data reported to ESMA and post-trade transparency data published by trading venues and APAs.

4.2.4.1 Transparency Publications

In line with the transparency requirements, ESMA publishes information about the liquidity classification of financial instruments, as well as the transparency thresholds - large in scale compared to the standard market size (LIS), and size specific to the instrument (SSTI) – above which transactions can qualify for a waiver or a deferred publication. Moreover, for equity instruments ESMA also publishes the calculations relevant for the determination of the tick-size regime.

On top of these, on a voluntary basis to assist investment firms in discerning whether they cross the threshold to qualify as Systematic Internalisers, ESMA publishes quarterly the overall trading volumes and number of transactions for securities on the European markets, and for sub-asset classes of derivative instruments.

4.2.4.2 Data quality

To ensure accurate results in the publications mentioned above, ESMA performs a series of data quality checks on its transparency database. These checks are performed quarterly and shared with the NCAs and DRSPs with the goal of correcting any misreports, and they encompass a series of data quality indicators such as completeness, consistency, and accuracy. Moreover, during the year 2023 a new Data Quality Engagement Framework was approved, allowing ESMA to concentrate on the most impacting issues while reducing the workload for the NCAs in the correction process.

Starting with the last quarter of 2022, focus has been given to the quality of data coming from APAs. As an effect, there has been a noticeable improvement in the information

received related to anomalies detected in the quantitative data.

The completeness of quantitative and reference data submitted for both equity and non-equity instruments remains stable and of good quality. The main areas where some improvements are still needed relate to the consistency between the transparency and DVC reports, and the consistency between the instrument classification coming from multiple venues.

While only a very low percentage of the total number of assessed records have been flagged as anomalies in equity quantitative data, a much higher number can be found in non-equity data, due to incorrect reporting practices of major Organised Trading Facilities as well as APAs. The anomalies were shared with the venues and required actions were taken to correct the misreported data.

Finally, 2023 saw a noticeable increase in the total volume reported under pre-trade waivers to FITRS. This reporting turned out to be erroneous and in addition it relates to the classification of so called "fractional shares"[58]. The relevant NCA took the necessary actions to liaise with the reporting entity and informed ESMA that once the policy discussion is settled it will finalise the data correction procedure with the reporting entity.

4.2.4.3 Main Data Quality Issues

Bond Type classification

One of the main data quality issues on securities data is the misalignment in the classifications of bonds provided by different market participants. To be specific, the issue comes from trading venues providing

---

58 https://www.esma.europa.eu/sites/default/files/2023-03/ESMA35-43-3547_Public_Statement_on_fractional_shares.pdf

conflicting values of BOND TYPE (RTS2 field 9) for the same instrument.

ESMA has been tackling this issue with the help of the NCAs for the past years, which has helped the data quality to improve significantly. However, over 5% of bonds available for trading in 2023 on European markets are still affected by this issue.

Chart 24
Misclassification of bonds – RCA MIC vs MIC
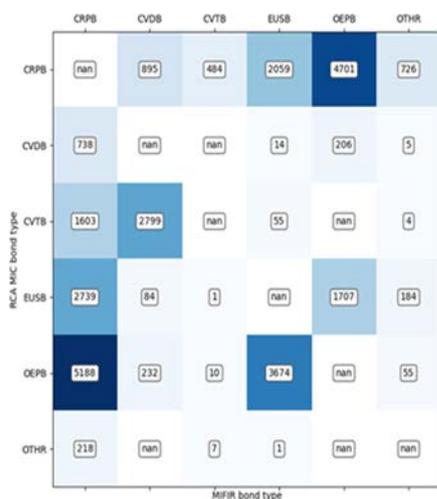
Currently, the most common misalignments are between corporate bonds (CRPB) and other types of bonds such as EU sovereign (EUSB), Covered bonds (CVDB), and other public bonds (OEPB, as well as between sovereign and other public bonds. The matrix from Chart 24 shows the differences in the classification of bond instruments present in the database between the relevant MIC (row) and the other MICs trading the instruments (columns).

Misreported quantitative data for Non-Equity Instruments

Another data quality issue in transparency data is related to misreports of quantitative data. ESMA has been working to correct these issues, both by improving the methodology for detecting anomalous values, and by collaborating with NCAs and DRSPs.

Currently, the main known issues come from DRSPs and OTFs. Over the past years, ESMA contacted multiple supervised DRSPs questioning the figures reported to transparency, and helped them identify issues in their reporting process, which led to major data corrections. Some issues are however still outstanding, in particular linked to a major APAs.

In addition to this, and thanks to the comparison between transparency and transaction data, ESMA was able to identify an incorrect reporting practice used by multiple Organised Trading Facilities, which led to the duplication of transactions in the transparency system. While the issue is still present, ESMA is in contact with the competent authorities to solve the problem and monitors the effects of these misreporting closely.

4.3 Securitisation data

4.3.1 Data collected by ESMA

Under the securitisation regulation, ESMA receives through securitisation repositories (SRs) information on public securitisations, including on underlying exposures and investor reports. SRs transmit to ESMA investor reports, significant event reports, granular data on underlying exposures, and daily end-of-day reports with aggregated data at securitisation level.

ESMA also maintains a register of simple, transparent, and standardised securitisation (STS), with information coming from their originators and sponsors. These securitisations fulfil a series of requirements designed to allow market participants to discern simple, transparent, and standardised products from more complex, opaque, and risky investments.

Chart 25
Aggregated current principal balance
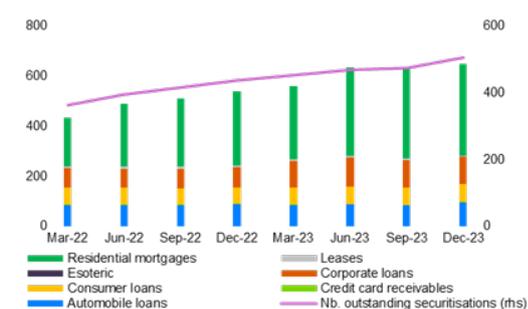
Note: Aggregated current principal balance, only securitisations with at least on EU counterparty, in EUR bn. Total number of outstanding securitisations.
Sources: Securitisation repositories, ESMA.

Total aggregated current principal balance or the amount of principal still due on the pool of outstanding securitised products reached EUR 657bn at the end of 2023, up from EUR 580 bn at the end of the previous year. 56% of these outstanding amounts were linked to residential mortgages, followed by corporate loans (17%), automobile loans (15%) and consumer loans (11%). As of December 2023, 505 individual securitised products had been reported.

Chart 26
Aggregated current principal balance, by STS status
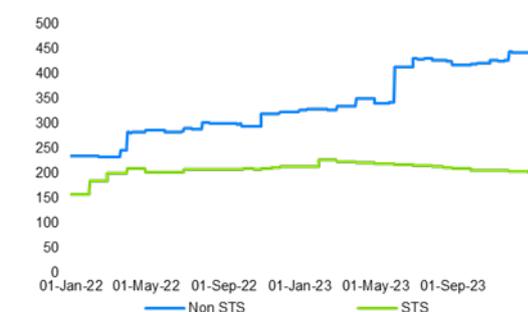
Note: Aggregated current principal balance by STS status, in EUR bn.
Sources: Securitisation repositories, ESMA.

As of end of 2023, the aggregated current principal balance for securitisations with a non-STS status has reached EUR 443bn, a significant increase compared with the same period of the previous year (EUR 328bn). On the other hand, the figures for simple, transparent, and standardised securitisations have remained steady, with a

slight decline from EUR 214bn in December 2022 to EUR 203bn at the end of 2023.

4.3.2 Data Quality Indicators

The disclosure framework allows for situations in which reporting entities are granted the option to submit an incomplete set of information when data unavailability can be justified by valid reasons, using the No Data Option. The current reporting framework includes five distinct types of No Data Options, each linked to an ND code that provides a reason for the unavailability of a specific field. SRs are responsible for verifying the completeness of data submissions, so they compute and disclose a 'data completeness score'[59]. Given that there may be an excessive reliance on ND options, this score is determined by considering the extent of their use, as an indicator of data completeness.

Chart 27
Completeness of data, based on the usage of ND options

	ND1 = 0%	0% < ND1 <= 10%	10% < ND1 <= 30%	ND1 > 30%
ND2-4 = 0%	47.5%	10.9%	1.6%	0.2%
0% < ND2-4 <= 20%	19.7%	15.3%	1.6%	0.0%
20% < ND2-4 <= 40%	1.4%	0.8%	0.0%	0.0%
ND2-4 > 40%	1.0%	0.0%	0.0%	0.0%

Note: ND1: Percentage of fields entered as 'ND1', ND2-4: Percentage of fields entered as 'ND2', 'ND3' or 'ND4'.
ND1: where the required information has not been collected because it was not required by the lending or underwriting criteria at the time of origination of the underlying exposure; ND2: where the required information has been collected at the time of origination of the underlying exposure but is not loaded into the reporting system of the reporting entity at the data cut-off date; ND3: where the required information has been collected at the time of origination of the underlying exposure but is loaded into a separate system from the reporting system of the reporting entity at the data cut-off date; ND4: where the required information has been collected but it will only be possible to make it available at a date taking place after the data cut-off date
Sources: Securitisation repositories, ESMA

Although in 47.5% of cases, no ND options are being used, their usage remains widely spread across the information received in the 503 securitisation reports considered for this analysis. With a particular focus on

---

59 Article 3 of the RTS on operational standards

addressing this data quality issue, as well as on enhancing the quality and use of securitisation data by investors and authorities, ESMA launched in December 2023 a consultation[60] on possible changes to the securitisation disclosure templates.

ESMA is monitoring daily the information received in the STS register and end-of-day reports through daily statistics on i.e., new STS notifications received, outstanding deals by asset class, different comparisons between the two datasets. In addition, the timeliness of the received reports is within the permitted thresholds, by comparing the date of the acceptance of the latest consolidated report with the current date (i.e. the date of end-of-day report).

ESMA is aiming at further enriching the quality of securitisation data during 2024 and enable the usage of the information for supervisory purposes.

---

60 https://www.esma.europa.eu/press-news/esma-news/esma-consults-possible-changes-securitisation-disclosure-templates

4.4 Funds data

4.4.1 AIFMD and MMFR

ESMA and the National Competent Authorities receive data on funds authorised and registered under the Alternative Investment Funds Directive (AIFMD) and the Money Market Fund Regulation (MMFR) reported by the asset managers. The data under both frameworks have been used by ESMA to monitor the fund industry development, to support policy activities and promote supervisory convergence[61]. The data support the NCAs in their supervisory activity, being the direct supervisors of managers and funds authorised in the EU.

The Alternative Investment Fund Managers Directive[62] (AIFMD) has created a comprehensive regulatory and supervisory framework for the alternative investment fund managers (AIFMs) at the European level. One of the major characteristics of the AIFMD is the introduction of reporting obligations, requiring managers to submit an extensive set of information, on managed funds, to their national authorities.

The Money Market Fund Regulation (MMFR)[63] has introduced a comprehensive regulatory and supervisory framework for the money market fund managers (MMFs) at the European level. The Regulation includes a reporting obligation for managers of MMFs and the requirement for ESMA to maintain a public register of authorised funds[64] and a database containing detailed information of MMF[65].

ESMA together with NCAs has developed a Data Quality Engagement Framework (DQEF) to assess and enhance the level of the quality of the data reported under AIFMD and MMFR. The Data Quality Engagement Frameworks are based on a set of tests to detect potential quality issues in prioritised areas. The tests are performed centrally by ESMA or individually by the NCA of the manager or by both. The scope of the framework is limited to year-end data and focuses on the four dimensions, ensuring that the provided information is i) complete ii) accurate, iii) consistent across different sources as well as iv) provided in a timely manner. Such tests identify potential reporting issues on which the NCAs – the direct supervisor of the reporting entities – engage to follow-up. The tests are run in various iterations (three for AIFMD and two for MMFR data) targeting the same reporting to monitor the evolution of the data quality and in particular the corrective actions taken. The Data Quality Engagement Framework is at its fourth yearly execution for AIFMD data and at its third for MMFR.

4.4.2 Data Quality Indicators

The Data Quality Engagement Frameworks consist in 35 tests for AIFMD data and 29 tests for MMFR data along the four dimensions of data quality. The tests target the data reported at the end of the previous year. Overall, it can be observed a positive impact of the data quality actions since the introduction of the Data Quality Engagement Frameworks in 2019 for AIFMD and 2020 for MMFR, with a general improvement in the

---

61 Paragrahs 3.3.2 and 3.3.7 of this report include key projects carried out in 2023 making use of AIFMD and MMFR data.
62 Directive 2011/61/EU on Alternative Investment Fund Managers
63 Regulation 2017/1131/EU on money market funds
64 Article 4 of MMFR provides that ESMA shall keep central public register identifying each MMF authorised, its type (whether it is authorised as a UCITS of an AIF), whether it is a short-term or standard MMF, the details of the manager and the competent authority.

65 Article 37 of MMFR includes a set of information to be transmitted from managers to Competent Authorities and from these to ESMA. This includes (a) the type and characteristics of the MMF; (b) portfolio indicators such as the total value of assets, NAV, WAM, WAL, maturity breakdown, liquidity and yield; (c) the results of stress tests and, where applicable, the proposed action plan; (d) information on the assets held in the portfolio of the MMF and (e) information on the liabilities of the MMF.

level of the quality (measured as a reduction in the number of potential issues identified).

Both the AIFM Directive and MMF Regulation establish that all funds shall report information at the end of the year while intra-year reporting applies to the funds above specific thresholds or that meet specific conditions. This means that the entire universe of AIF and MMF managers is expected to report at the end of the year. One measure of **completeness** of MMFR data is based on the comparison of the number of funds reported in ESMA register with the number of funds reporting in the system. Completeness has increased for MMFs from 90% at the end of 2020 to 97% at the end of 2022. For AIFMD data, completeness varies across Member States[66].

Timeliness of reporting – measured as the time between the end of the reference reporting period and the effective date of reporting – has been consistently improving for both AIFMD and MMFR reporting[67]. In AIFMD reporting, the number of funds reporting above 90 days after the end of the reporting period decreased from 45% in 2019 to 19% in 2022. For MMFR data, the number of funds reporting after 30 days after the end of the reporting period amount to 0.4% of the total (declining from 44% at the end of 2020).

Most of the indicators for AIFMD suggest an improvement in the data quality since the introduction of the DQEF. Significant improvements can be observed in LEI completeness and investors' profile. At the same time, while there have been improvements in the information on leverage, the quality of the data is still not adequate to allow for an effective use of the data.

Chart 28

Average number of warnings in AIFMD
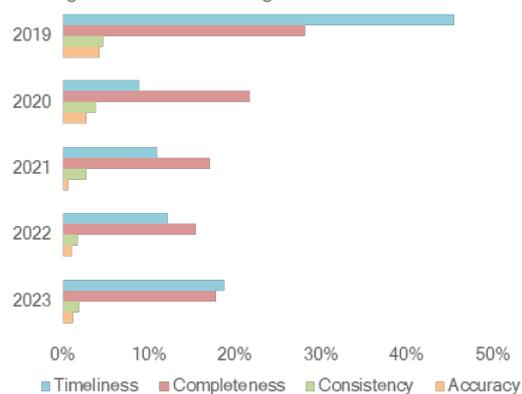
Note: Average number of warnings generated in the AIFMD DQEF targeting end of previous year data, by data quality dimension.
Sources: AIFMD, ESMA

It shall be noted that when comparing the DQEF executed in 2023 (targeting year-end 2022 data) to the previous year (focused year end 2021 data), no major improvements are observed in the data quality. Most indicators suggest that data quality for 2022 year-end data is at a similar or slightly lower level than the one recorded last year for 2021 end of year data. It shall be noted that the overall data quality appears to be heterogeneous across country especially for the checks generating higher percentage of errors.

Similarly, most of the indicators for MMFR indicate an improvement in the level of data quality between 2020 and 2022 end of year data. It can be observed an improvement in the accuracy of the data reported for NAV and asset values, for investors' profile. The results are less unequivocal when comparing 2021 year-end data and 2022 year-end data. While the overall number of warnings decreased, only 2% of the issues identified were actively treated (as opposed to the 16% of last year). In some areas – particularly on stress test results – it can be observed a net improvement in the quality of reported data. Some other indicators – including value of assets and portfolio indicators – have

---

66 Since 2019 the Danish Financial Supervisory Authority has not submitted data for AIFMs authorised in Denmark.
67 It shall be noted that the AIFM Directive, does not include a deadline for submitting the information to ESMA. On the

contrary, The MMF Regulation establish that reports shall be transmitted to ESMA no later than 30 days after the end of the reporting quarter.

experienced negative evolution of their data quality with an increase in the percentage of warnings related to year-end 2022 compared to year-end 2021 and 2020. For half of the tests no relevant change can be identified in terms of generated warnings.

Chart 29
Average number of warnings in MMFR
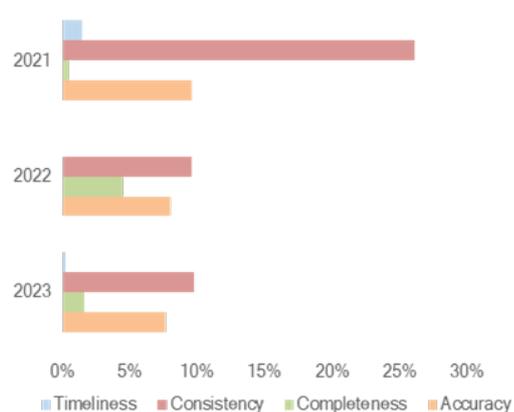
Note: Average number of warnings generated in the DQEF targeting end of previous year data, by data quality dimension.
Sources: MMFR, ESMA

Improvements in data quality because of corrective actions vary across Member states: in some jurisdictions the improvement in data quality is more marked when comparing the median and 90th percentile of warnings generated between the first and second iteration. However, it must be noted that some countries appear with very high value in the 90th percentile of warnings generated due to the very low number of MMF in their jurisdiction.

Finally, it shall be noted that, thanks to the issues raised with the DQEF, other actions promoting a better data quality were taken including introduction of new validation rules in AIFMD and MMFR reporting and work to enhance convergence and guidance in the definition of reporting fields.

Given some of the issues identified above, e.g. lack of improvement between 2022 and 2023 and lack of proactiveness in certain jurisdictions and to leverage from the positive experience reported above with the EMIR and SFTR DQEFs, for the next executions of

the AIFMD and MMFR DQEFs ESMA and the NCAs are planning to shift towards a risk-based approach to address the most impactful issues at EU level in line with the ESMA data strategy. Moreover, the DQEF will increase in frequency of execution from end of year reporting of target quarterly reporting for MMFR and semi-annually for AIFMD.

5 Conclusions and next steps

As explained in previous sections, ESMA has delivered on its commitment to implement data quality monitoring for the datasets under its remit. The intensity of the monitoring is intrinsically linked with the complexity of the dataset and ESMA responsibilities. To support this, ESMA has been carefully setting up a risk-based approach across the different tata quality frameworks. These frameworks provide a common approach, consistent across the various datasets, which allows not only to detect relevant issues, but also to follow-up on their resolution and to monitor data quality over time.

Under those frameworks, the joint efforts and engagements of the industry, NCAs and ESMA has led to significant improvements of data quality across the board. Yet, there remains room for further improvement of data quality, as well as signals of data quality deterioration on certain dimensions, which ESMA will continue monitoring.

The transparency of the data quality monitoring via the publication of additional documentations (DQIs methodologies, codes) will further contribute to a mutual understanding between reporting entities, market infrastructures, data users and the regulatory community and a better alignment of priorities.

6 Annex

6.1 Data quality indicators – methodology

6.1.1 EMIR

The table below provides an overview on data quality indicators and their methodology that are regularly calculated and monitored by ESMA at EEA level to derive trends in data quality developments across the whole EMIR data set. Further those indicators are calculated for each jurisdiction and distributed among the NCAs. While the list provides an insight into the data quality work it should not be assumed that these are the only data quality aspects that regularly analysed by data quality supervisors.

DQI	Description	Dataset
1. Difference in number of outstanding trades	A difference in the number of outstanding derivatives at trade level between a given pair of counterparties as reported by the two sides. Trades where other counterparty is non-EEA or is identified with a client code are excluded.	TSR
2. Difference number of outstanding positions	A difference in the number of outstanding derivatives at position level between a given pair of counterparties as reported by the two sides. Trades where other counterparty is non-EEA or is identified with a client code are excluded	TSR
3. Difference in number of reports with AT=N	A difference in the number of reports with action type 'New' submitted during the previous month by the two sides. Trades where other counterparty is non-EEA or is identified with a client code are excluded	TAR
4. Difference in number of reports with AT=P	A difference in the number of reports with action type 'Position component' submitted during the previous month by the two sides. Trades where other counterparty is non-EEA or is identified with a client code are excluded.	TAR
5. Unpaired reports	Number on outstanding unpaired derivatives in the TSR.	TSR
6. Number of Rejections	Number of rejected reports in the previous month.	REJ
7. Late reports	Number of late reports in the previous month.	TAR
8. Outdated valuation	Number of outstanding reports with not updated valuation - only for FCs, NFCs+ and CCPs.	TSR
9.Blank/abnormal maturity date	Number of outstanding reports with blank/abnormal maturity date - for derivatives other than CFDs.	TSR
10. Missing Valuation	Number of outstanding reports with missing valuation - only for FCs, NFCs+ and CCPs. Derivatives executed on T and T-1 should be excluded.	TSR
11. Missing Collateralisation	Number of outstanding reports with missing collateralisation - only for FCs, NFCs+ and CCPs.	TSR
12. Missing VM	Number of outstanding reports with missing variation margin - only for FCs, NFCs+ and CCPs. Derivatives executed on T and T-1 should be excluded.	TSR
13. Matching	Number on outstanding unmatched derivatives in the TSR.	TSR
14. Anomalies	Abnormal/anomalous values identified using statistical (non-parametric approaches such as: min, max, standard deviation etc.) and machine learning algorithms. Expert judgement is applied to sense check identified occurrences before they are being distributed to CAs.	TSR
15. Lack of LEI	Number of outstanding derivatives with private individual and high notional/valuation.	TSR

DQI	Description	Dataset
16. Duplicate reports	Number of duplicated outstanding derivatives.	TSR
17. Counterparty nature	Number of outstanding derivatives with inconsistent counterparty nature.	TSR
18. Corporate Sector	Number of outstanding derivatives with inconsistent corporate sector.	TSR
19. Consistent Margins	A difference in the total value of margins posted and received between a given pair of counterparties as reported by the two sides.	TSR

6.1.2 MiFIR Transparency (FITRS)

Name	Area	Scope	Objective
BOND_1 - Bond Outliers	Accuracy	Trading volumes	Checks the presence of daily trading values that lie far away from their reference distribution
BOND_2 – Notional Amount	Accuracy	Reference data	Checks instruments with a reporting total notional amount below 10 thousand EUR
BOND_3 – Classification	Consistency	Reference data	Checks whether the CFI reported for the bond is in line with its classification
BOND_4 – Bond Type	Consistency	Reference data	Checks whether the classification of the bond type is consistent between the various MICs, and whether bonds with sovereign issuers are correctly classified as such
NQT_1	Completeness	Quantitative data	Checks whether all expected data for non-equity instruments has been correctly submitted
NQT_2	Completeness	Reference data	Flags instruments that are missing reference data in FITRS
NQT_3	Consistency	Reference data	Checks whether the MiFIR identifier reported by different venues for the same instruments are consistent
NQT_4 – Maturity dates	Consistency	Reference data	Flags instruments whose maturity date is inconsistent between FIRDS and FITRS reference data, or whose maturity data is not in line with the instrument's own characteristics

Name	Area	Scope	Objective
NQT_5 - Outliers	Accuracy	Stress tests results	Check for implausible values in input factor
COM_1	Completeness	Reference data	Flags instruments that are missing reference data specific to each class of commodity derivatives
COM_2	Accuracy	Delivery Location	Check that the delivery location reported for commodity derivatives is a valid EIC code provided by ENTSOe

6.1.3 Funds

6.1.3.1 AIFMD

Name	Area	Scope	Objective
File transmission: Register	Completeness	Technical	Number of files transmitted to the register during the period by country of origin and transmission status
File transmission: System	Completeness	Technical	Number of files transmitted to the AIFMD system during the period by country of origin and transmission status
Number of authorised managers as reported to ESMA Registers	Completeness	Records	Provide universe of authorised managers in ESMA register for NCAs to validate completeness of the register
Number of funds managed by authorised AIFMs: ESMA Register	Completeness	Records	Provide universe of funds managed by authorised managers in ESMA register for NCAs to validate completeness of the register
Number of managers as reported to AIFMD system	Completeness	Records	Inform on completeness of AIFMs for which reports are available in the system at the end of each reference period NCA to follow up to ensure transmission
Number of funds as reported to AIFMD system	Completeness	Records	Inform on completeness of AIFs for which reports are available in the system at the end of each reference period NCA to follow up to ensure transmission
Lag in reporting of funds as reported to AIFMD system	Timeliness	Records	Average number of days by jurisdiction between the end of the period of report and the effective transmission of the first valid report for the funds to the AIFMD system
LEIs of managers in AIFMD register	Completeness	Identifiers (LEI, ISIN)	List of managers lacking an LEI in the register NCAs to take action in case of erroneous data as compared with GLEIF
LEIs of managers in AIFMD system	Completeness	Identifiers (LEI, ISIN)	List of managers lacking an LEI in the system NCAs to take action in case of

Name	Area	Scope	Objective
			erroneous data as compared with GLEIF
LEIs of funds in AIFMD system	Completeness	Identifiers (LEI, ISIN)	List of funds lacking an LEI in the system NCAs to take action in case of erroneous data as compared with GLEIF
Inconsistent LEI in the system and in the register	Consistency	Identifiers (LEI, ISIN)	The LEI of the fund and the manager (In the system and the register) should not be the same
LEIs on funds having derivatives in AIFMD system or having reporting obligations under MiFID	Completeness	Identifiers (LEI, ISIN)	The fund trading derivatives should have an LEI under EMIR and the funds that included in the MiFID reporting obligation as well
Possible available LEIs on AIFMs in AIFMD system	Completeness	Identifiers (LEI, ISIN)	List of managers lacking an LEI for which a possible LEI exists using other public information (e.g. ECB RIAD, BIC code conversion, string matching) Provision, review and correction by NCAs on the adequacy of missing LEI on AIFMs
Possible available LEIs on AIFs in AIFMD system	Completeness	Identifiers (LEI, ISIN)	List of funds lacking an LEI for which a possible LEI exists using other public information (e.g. ECB RIAD, BIC code conversion, string matching) Provision, review and correction by NCAs on the adequacy of missing LEI on AIFs
Consistency of percentages of financing	Consistency	Financing	Number of funds (or list) with inconsistent percentages of financing amount by days brackets
Sum of the value of main instruments (net) against AUM	Accuracy	AUM	Number of funds (or list) for which the sum of the values (taken into consideration long/short) of the main instruments is larger than reported AUM by a large margin (possible adjustments considering type of funds or other information)
Consistency of the reported liquidity and type of fund	Consistency	Liquidity	Number of funds (or list) for which the average liquidity does not match with the type of fund. NCA reviews possible cases
Number of funds (or list) for which the value of NAV is considered to be suspicious	Accuracy	NAV	Number of funds (or list) for which the value of NAV is considered to be suspicious given its level, its evolution, other information (ECB-RIAD) or other rule derived directly from the ESMA available data NCA reviews cases
Statistics of total NAV	Accuracy	NAV	Aggregated figures on NAV as reported to the AIFMD system by jurisdiction and with basic breakdowns to support quality review from top-down approach
Statistics of total AuM	Accuracy	AuM	Aggregated figures on AuM as reported to the AIFMD system by jurisdiction and with basic breakdowns to support quality review from top-down approach
Distribution statistics (percentiles of AIFs) of reported leverage ratio as reported to the	Accuracy	Leverage	Provide distribution statistics of reported leverage ratio to support

Name	Area	Scope	Objective
AIFMD system by jurisdiction and with basic breakdowns			quality review from top-down approach
Investor concentration vs investor group type (i.e. retail and professional)	Consistency	Investor concentration	Compare the reported percentages under investor concentration to the ones reported under investor group type for both professional clients and retail investors.
Reporting code consistency	Completeness	Reporting code	Check if the 'Reporting code' is correctly reported and if the code of the AIF is in line with the one of the AIFM
No reporting flag consistency	Consistency	No reporting flag	Check if the No reporting flag is reported consistently with its status/constitution date and the consistency between fund and manager (i.e. 'no reporting flag' fund against "last reporting flag" manager)
Reporting code consistency for leveraged AIF	Consistency	Reporting code	Check if AIF that are leveraged according to reporting code are really leveraged
AIF reported in EMIR but LEI not available in AIFMD	Completeness	Identifiers (LEI, ISIN)	Improve completeness of the provided LEIs
Completeness of portfolio liquidity and investor liquidity	Completeness	Liquidity	When AIF information on portfolio liquidity or investor liquidity is reported the other side should be provided as well.
Sum of the value of principal exposures against AUM	Accuracy	AUM	Number of funds (or list) for which the sum of the values (taken into consideration long/short) of the principal exposures is larger than reported AUM by a large margin (possible adjustments considering type of funds or other information)
Distribution statistics (percentiles of AIFs) of reported CS01 and DV01 as reported to the AIFMD system by jurisdiction and with basic breakdowns	Accuracy	CS01 and DV01	Provide distribution statistics of reported CS01 and DV01 to support quality review from top-down approach
Distribution statistics (percentiles of AIFs) of reported net equity delta, net commodity delta, net FX delta as reported to the AIFMD system by jurisdiction and with basic breakdowns	Accuracy	net equity delta, net commodity delta, net FX delta	Provide distribution statistics of reported net equity delta, net commodity delta, net FX delta to support quality review from top-down approach
Distribution statistics (percentiles of AIFs) of reported VaR as reported to the AIFMD system by jurisdiction and with basic breakdowns	Accuracy	VaR	Provide distribution statistics of reported VaR to support quality review from top-down approach
reported CS01 and DV01 - suspicious values	Accuracy	CS01 and DV01	Check the accuracy of the reported data on CS01/DV01
reported Net equity delta, Net FX delta, Net commodity delta - suspicious values	Accuracy	net equity delta, net commodity delta, net FX delta	Check the accuracy of the reported data on Net Delta using principal exposure data
reported VaR - suspicious values	Accuracy	VaR	Check the accuracy of the reported data on VaR
File transmission: Register	Completeness	Technical	Number of files transmitted to the register during the period by country of origin and transmission status
File transmission: System	Completeness	Technical	Number of files transmitted to the AIFMD system during the period by

Name	Area	Scope	Objective
			country of origin and transmission status
Number of authorised managers as reported to ESMA Registers	Completeness	Records	Provide universe of authorised managers in ESMA register for NCAs to validate completeness of the register
Number of funds managed by authorised AIFMs: ESMA Register	Completeness	Records	Provide universe of funds managed by authorised managers in ESMA register for NCAs to validate completeness of the register
Number of funds as reported to AIFMD system	Completeness	Records	Inform on completeness of AIFs for which reports are available in the system at the end of each reference period NCA to follow up to ensure transmission
Lag in reporting of funds as reported to AIFMD system	Timeliness	Records	Average number of days by jurisdiction between the end of the period of report and the effective transmission of the first valid report for the funds to the AIFMD system
LEIs of managers in AIFMD register	Completeness	Identifiers (LEI, ISIN)	List of managers lacking an LEI in the register NCAs to act in case of erroneous data as compared with GLEIF
LEIs of managers in AIFMD system	Completeness	Identifiers (LEI, ISIN)	List of managers lacking an LEI in the system NCAs to act in case of erroneous data as compared with GLEIF
LEIs of funds in AIFMD system	Completeness	Identifiers (LEI, ISIN)	List of funds lacking an LEI in the system NCAs to take action in case of erroneous data as compared with GLEIF
Inconsistent LEI in the system and in the register	Consistency	Identifiers (LEI, ISIN)	The LEI of the fund and the manager (In the system and the register) should not be the same
LEIs on funds having derivatives in AIFMD system or having reporting obligations under MiFID	Completeness	Identifiers (LEI, ISIN)	The fund trading derivatives should have an LEI under EMIR and the funds that included in the MiFID reporting obligation as well

6.1.3.2   MMFR

Name	Area	Scope	Objective
File transmission	Completeness	Technical	Number of files transmitted to the register during the period by country of origin and transmission status
File transmission	Completeness	Technical	Number of files transmitted to the MMFR system during the period by country of origin and transmission status
Number of managers as reported to ESMA Register	Completeness	Records	Provide universe of AIFM or management companies managing authorised MMFs in ESMA register for NCAs to validate completeness of the register
Number of funds authorised as MMF in ESMA Register	Completeness	Records	Provide universe of funds authorised as MMF in ESMA MMF register for

Name	Area	Scope	Objective
			NCAs to validate completeness of the register
Lag in reporting authorised funds: Register	Punctuality	Records	Detect if the difference in dates between authorisation date and first transmission to ESMA register is higher than 3M
Lag in reporting of funds as reported to MMF system	Punctuality	Records	Number of days by jurisdiction between the end of the period of report and the effective transmission of the first valid/invalid report for the funds to the MMF system
Statistics of total NAV	Accuracy	Geographical exposure (NAV)	Aggregated figures on NAV as reported to the MMF system by jurisdiction and with basic breakdowns to support quality review from top-down approach
Compare the number of managers as reported in the MMFR Register with the number reported in the system	Consistency	Records	Inform on completeness of MMF managers for which reports are available in the system at the end of each reference period NCA to follow up to ensure transmission
Compare reported investor concentration type	Consistency	Investor type (ownership)	Compare reported investor concentration type (i.e. professional; retail) with investors sector breakdown
Inconsistent LEI in the system and in the register	Consistency	Identifiers	The reported LEI of the manager and of the fund should not be the same.
Consistency check of reported LEIs	Consistency	Identifiers	Check the consistency of different reported LEIs (e.g. counterparty LEI is different from the MMF LEIs)
Check the correctness of information on UCITS / MMF Register	Accuracy	Identifiers	Check the LEI of the MMF manager with the UCITS Register when MMF is UCITS
Check the correctness of information on AIFMD / MMF Register	Accuracy	Identifiers	Check the LEI of the MMF manager with the AIFMD Register when MMF is an AIF
Check the correctness of information on AIFMD / MMF Register	Accuracy	Identifiers	Check the LEI of the MMF manager with the AIFMD system when MMF is an AIF
Check the correctness of information on AIFMD/ MMF	Accuracy	Identifiers	Check the MMF reported as AIF with the funds reported under AIFMD system
Check the completeness of the ECB code	Accuracy	Identifiers	Link with ECB – RIAD: Check the completeness of the ECB code and check the ones reported with ECB – RIAD database.
Number of funds (or list) for which the value of NAV is suspicious	Accuracy	NAV	Number of funds (or list) for which the value of NAV is suspicious in relational to the Total Asset Value
Funds with erroneous conversion from base currency	Accuracy	Conversions	Funds with erroneous conversions from base currency (since both the base currency and EUR is provided, the correctness of the conversion can be checked). At this stage, with focus on total exposure by instrument type.

Name	Area	Scope	Objective
WAM implausible value	Accuracy	Maturity profile	Check on implausible values: < 1 day and > 75 (STMMF) / >200 (STDMMF)
WAL	Accuracy	Maturity profile	Check on implausible values: < 1 day and > 150 (STMMF) / >400 (STDMMF)
WAM>=WAL	Accuracy	Maturity profile	Check on implausible values: WAL shall be greater or equal to WAM
DLA	Accuracy	Liquidity profile	Check on implausible values: < 1 (> 100 already in validation rules)
WLA	Accuracy	Liquidity profile	Check on implausible values: < 1 (> 100 already in validation rules)
Implausible inception date	Accuracy	Inception date	Check on implausible values: Inception date shall be greater or equal to the implementation date of the MMFR, and less than the reporting end date
LEI of issuers/counterparty/MMF missing	Completeness	Other LEI completeness	Check for missing values in LEI codes reported for issuers/counterparties
Implausible values in stress tests results (NAV impact)	Accuracy	Stress tests results	Check for implausible values in stress test results (NAV impact)
Implausible values in stress tests results (outflows impact)	Accuracy	Stress tests results	Check for implausible values in stress test results (outflows impact)
Implausible values in input factor	Accuracy	Stress tests results	Check for implausible values in input factor
Completeness of stress test results	Completeness	Stress tests results	Check that all results of stress test are reported
Accuracy of FX test results	Accuracy	Stress tests results	Check that results of stress test are symmetrical
Missing LEI of the manager/fund in the register	Completeness	LEI of the manager/fund	Check for missing LEI of the manager/fund in the register

6.2 Automation of APA post-trade transparency data download

APAs are required to make available post-trade transparency data available on their websites in a machine-readable way and in accordance with operational, and format and content rules prescribed by MiFIR[68].

To facilitate access, ESMA provides below sample code to automatically download data files from APAs websites. The code samples below utilise Python's open-source framework Requests[69]. However, other frameworks (e.g. cURL) can be used as well. Importantly, each APA has chosen its own unique method of providing data to the public and additional automation needs to be implemented by the user to download information on a continuous basis and parse information stored in the files. The code provided below is for demonstration purposes only is not aimed to provide a full working solution to process APA-published data nor it is maintained and kept up to date. Finally, by sharing the code below, ESMA does not make a statement as to compliance or lack thereof by APAs with relevant provisions of MiFIR.

---

[68] Commission Delegated Regulation 2017/587, Commission Delegated Regulation 2017/583 and Commission Delegated Regulation 2017/571
[69] https://requests.readthedocs.io/en/latest/

EU APA Name	Sample code
Bloomberg Data Reporting Services	``` import requests url = "https://www.bloombergapae.com/download?key=BAPE-POST2-<YYYYMMDD-hh:mm:ss>.csv" response = requests.request("GET",url) print(response.text) ```
CBOE Europe	``` import requests url = "https://markets.cboe.com/europe/equities/trade_data/apa/hour/rts13_public_trade_data_apa_<YYYY-MM-DD_HH>.csv" response = requests.request("GET",url) print(response.text) ```
MarketAxess Post-Trade	``` import requests url = "https://<PERSONALTOKEN>.cloudfront.net/TRADES/TRNL_APA/<YYYY-MM-DD>.csv" response = requests.request("GET",url) print(response.text) ```
Nasdaq Stockholm	``` import requests date = "YYYY-mm-dd" url = "https://www.nasdaqomxnordic.com/webproxy/DataFeedProxy.aspx" headers = {"User-Agent": "Safari/526.5"} post_query = f"""<post> <param name="FromDate" value="{date}"/> <param name="ToDate" value="{date}"/> <param name="SubSystem" value="Prices"/> <param name="Action" value="GetTrades"/> <param name="Exchange" value="NMF"/> <param name="ext_xslt" value="/nordicV3/trades_apa_csv.xsl"/> <param name="ext_xslt_lang" value="en"/> <param name="ext_xslt_tableId" value="apatradelisttable"/> <param name="ext_xslt_notlabel" value="fnm"/> <param name="ext_xslt_hiddenattrs" value=",nm,mktid,"/> <param name="Instrument" value="XOPV43385"/> <param name="t.a" value="30,38,24,27,5,1,2,18,19,41,32,39,33,26,40,35,36,28,99"/> <param name="showall" value="1"/> <param name="ext_contenttype" value="application/ms-excel"/> <param name="ext_contenttypefilename" value="APATrades-{date}-{date}.csv"/> <param name="ext_xslt_options" value=",excel,"/> <param name="app" value="/nasdaq-apa/apa-historical-trades"/> </post> """ query = {"xmlquery":post_query} response = requests.request("POST",url,data=query,headers=headers) print(response.text) ```
Tradeweb EU	``` import requests url = "https://<PERSONALTOKEN>.mifid.io.tradeweb.com/Tradeweb_BV_APA_Post-Trade_TWEA/BV_TWEA_<YYYYMMDD>_<hhmm>.csv" response = requests.request("GET",url) print(response.text) ```
UnaVista TRADEcho	``` import requests url = "https://dmd.lseg.com/dmd/download/<MIC>/<CHANNEL>/posttrade/<CHANNEL>-post-<YYYY-MM-DD>T<hh_mm>.csv" response = requests.request("GET", url) print(response.text) ```

6.3 List of publications using data

ESMA	**Trends, Risks and Vulnerabilities report** TRV No. 1, 2023: <u>ESMA Report on Trends, Risks and Vulnerabilities No. 1, 2023</u> TRV No 2, 2023: <u>ESMA Report on Trends, Risks and Vulnerabilities No. 2, 2023</u> **Markets Reports** <u>EU MMF market 2023</u> <u>The EU Credit Ratings market 2023</u> <u>Costs and Performance of EU Retail Investment Products 2023</u> <u>EU Derivatives Markets 2023</u> <u>EU Alternative Investment Funds 2023</u> **TRV Risk Analysis** • Orderly markets : <u>Evolution of EEA share market structure since MiFID II</u> <u>The August 2022 surge in the price of natural gas futures</u> <u>The EU securitisation market – an overview</u> • Financial stability <u>EU natural gas derivatives markets: risks and trends</u> <u>Stress testing MMFs in the EU - First evidence from fund reporting</u> **Other publications** <u>Preliminary data report on the introduction of the market correction mechanism</u> <u>Effects Assessment of the impact of the market correction mechanism on financial markets</u> <u>Final Report on the implementation and functioning of the intra-day volatility management mechanism</u>
ECB/ESRB	**ECB Financial Stability Review (FSR) boxes, Special Features, and working papers:** - Clearing and interconnectedness FSR May 2023 Special Feature A: <u>Key linkages between banks and the non-bank financial sector</u> ECB Working Paper Sep 2022: <u>Uncovering the network structure of non-centrally cleared derivative markets: evidence from regulatory data</u> - Liquidity risk & Margin ECB Working Paper Mar 2023: <u>Derivative margin calls: a new driver of MMF flows</u> (also published as IMF WP)

	- Interest rate derivatives FSR Nov 2023 Special Feature A: Assessing risks from euro area banks' maturity transformation SUERF Policy Brief Mar 2023: The euro interest rate swap market: Recent trends in trading activity and liquidity **ESRB:** Several research papers based on EMIR data have been published on the ESRB Working Paper series: https://www.esrb.europa.eu/pub/series/working-papers/html/index.en.html
AFM	Trend Monitor 2024: Trend Monitor 2024 (afm.nl) State of the capital market 2023: AFM calls for a European set of capital market data AFM Market Watch newsletters (e.g. Substantial holdings and gross short positions): AFM Market Watch
AMF	MMFR https://www.amf-france.org/fr/actualites-publications/publications/rapports-etudes-et-analyses/levolution-du-marche-des-fonds-monetaires-francais-entre-le-30-juin-2021-et-le-30-juin-2023 https://www.amf-france.org/fr/actualites-publications/publications/rapports-etudes-et-analyses/levolution-du-marche-des-fonds-monetaires-francais-entre-le-31-mars-2021-et-le-31-mars-2023 MIFIR https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/brokers-margins-french-bond-market https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/retail-investor-activity-and-standard-profiles
CBoI	EMIR & SFTR: Irish-Resident LDI Funds and the 2022 Gilt Market Crisis.
Consob	Guideline on how to report to Consob transactions subject to MiFIR transaction reporting, consolidating all L2 and L3 regulations, and common practices agreed at the EU level:

	https://www.consob.it/web/area-operativa-interattiva/transaction-reporting
CSSF	The Impact of Covid-19 on Large Redemptions in the Luxembourg Investment Fund Market MMF Risk Dashboard AIFM Risk Dashboard CSSF-CAA joint conference on EMIR reporting
Finanssivalvonta	Funds – AUM and NAV : *https://www.finanssivalvonta.fi/globalassets/fi/tilastot/paaomamarkkinat/rahastoyh tioiden-hallinnoimat-paaomat/rahastoyhtioiden_hallinnoimat_paaomat.xlsx*
Finanstilsynet	Report on alternative investment funds *https://www.finanstilsynet.no/publikasjoner-og-analyser/rapport-om-alternative-investeringsfond/*
LB	https://www.lb.lt/uploads/publications/docs/40036_feaff6b15464a8cf745291e807a e1b85.pdf
MFSA	https://www.mfsa.mt/wp-content/uploads/2022/02/Circular-on-Regulation-N0-6482012-The-European-Market-Infrastructure-Regulation-Supervisory-Interactions-General-Findings.pdf Liquidity Stress Testing for Maltese Retail Investment Funds (mfsa.mt)

6.4 List of abbreviations

AIFMD Alternative Investment Fund Managers Directive

APA Approved Publication Arrangement

ARM Approved Reporting Mechanism

AuM Assets under Management

bps Basis points

CCP Central counterparty

CDS Credit Default Swaps

CTP Consolidated Tape Provider

DQI Data Quality Indicator

DRSP Data Reporting Service Provider

DTO Derivatives Trading Obligation

EMIR European Market Infrastructure Regulation

ESMA European Securities and Markets Authority

ESRB European Systemic Risk Board

EU European Union

ECB European Central Bank

FITRS Financial Instruments Transparency System

FIRDS Financial Instruments Reference Data System

IT Information Technology

LEI Legal Entity Identifier

LHS Left-Hand Side

MIC Market Identifier Code

MIFID Markets in Financial Instruments Directive

MIFIR Markets in Financial Instruments Regulation

MMFR Money Market Funds Regulation

NAV Net Asset Value

NCA National Competent Authority

OTC Over the counter

RHS Right-Hand Side

SI Systematic Internaliser

SFT Securities Financing Transaction

SFTR Securities Financing Transactions Regulation

SR Securitisation repository

SupTech Supervisory Technology

ToTV Traded on a trading venue

TR Trade repository

TRV Trends, Risks, and Vulnerabilities

TSR Trade State Report

TAR Trade Activity Report

VaR Value at Risk

Currencies and countries abbreviated in accordance with ISO standards.