

2022 Report on Quality and Use of Transaction Data

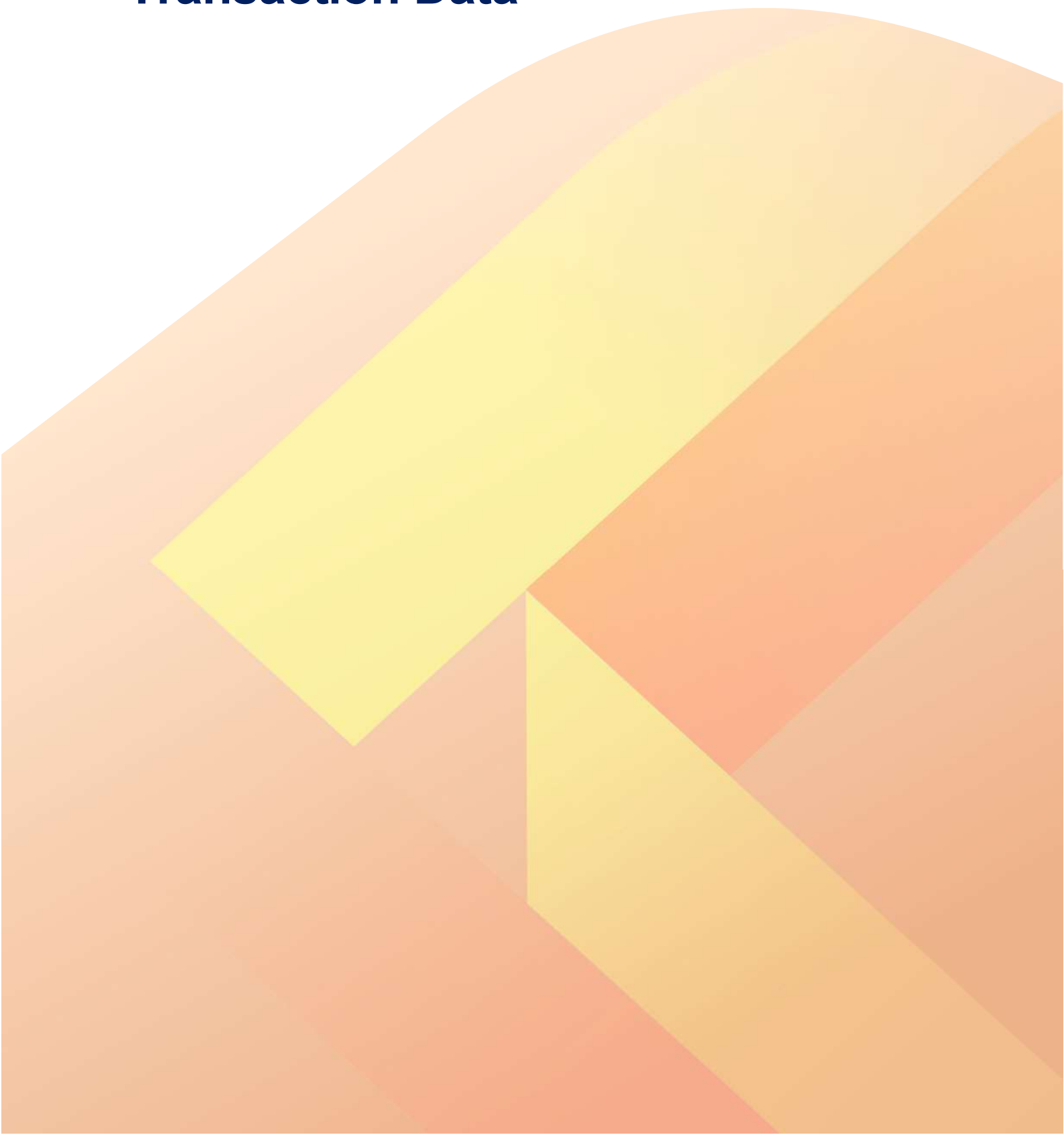


Table of Contents

1	<i>Executive summary</i>	5
2	<i>Use of EMIR, SFTR and MiFIR transaction data</i>	7
2.1	Introduction	7
2.2	NCA, ECB and ESRB	7
2.2.1	On-going monitoring of key trends in European derivatives markets.....	7
2.2.2	Monitoring of derivatives exposures, market infrastructures and other financial markets participants	7
2.2.3	Detection and monitoring of market abuse behaviour.....	8
2.2.4	Market and risk monitoring for specific segments and asset types.....	8
2.2.5	Monitoring of reporting obligation	8
2.3	ESMA	9
2.3.1	Trends, Risk and Vulnerabilities report (TRV).....	9
2.3.2	Exposures of EU counterparties – Archegos	9
2.3.3	Markets reports.....	9
2.3.4	Carbon markets and Derivatives Trading Obligation (DTO).....	9
2.3.5	Publication of CDS prices	9
2.3.6	Firms under ESMA and NCA direct supervision.....	10
2.3.7	Transparency data monitoring	10
2.3.8	Retail risk monitoring	10
3	<i>New approach to monitoring data quality</i>	11
3.1	Introduction	11
3.2	Data quality dashboards	11
3.3	NCA data sharing frameworks	12
4	<i>Key developments impacting data quality</i>	13
4.1	EMIR data and SFTR data	13
4.1.1	EMIR Refit technical standards, guidelines, and technical documentation.....	13
4.1.2	EMIR DQIs and dissemination of the results to NCA	14
4.1.3	Remediation of issues identified in EMIR supervisory reviews	18
4.1.4	Wind-down of UnaVista under SFTR and porting of data to other TRs	20
4.1.5	Adherence to SFTR format and content rules – ESMA revalidation	20
4.2	MiFIR data	22
4.2.1	ESMA becomes the supervisor of significant DRSPs	22
4.2.2	Timeliness of publication (APA).....	25
4.2.3	Insights from the analysis of CDS prices.....	26
4.2.4	Publication of transparency data by Systematic Internalisers (SIs)	26
4.2.5	Lessons learnt from the analysis of MiFIR transaction data for the carbon markets report	27

- 4.2.6 Consistency of transaction and transparency data 29
- 4.2.7 APAs Transparency data outliers 29
- 4.3 Conclusions and next steps31**
- 5 Annex 32**
- 5.1 List of publications utilizing transaction-level data under EMIR, SFTR and MiFIR 32**
- 5.2 List of abbreviations36**

1 Executive summary

ESMA is publishing its 3rd data quality report on transaction-level data. The first two iterations focused on EMIR and SFTR. In this year report, ESMA additionally covers transaction reports collected under MiFIR and provided by National Competent Authorities for the supervision of Data Reporting Service Providers (DRSPs).

Transaction-level data plays a critical role in the day-to-day processes of National Competent Authorities (NCAs), central banks (such as the ECB) and ESMA. The data is being used extensively for various use-cases falling broadly under the financial market stability, orderly markets and integrity mandates. In section 2, ESMA provides a detailed overview of various use-cases, including, where possible, references to publicly available documents. Even though the use of transaction-level data is well established, ESMA sees many more opportunities to further leverage the data for its supervisory, single-rulebook, economic research and supervisory convergence mandates along the lines of ESMA's 2023-2028 strategy.

As regards EMIR and SFTR data quality, ESMA has transitioned to an entirely new approach to monitoring and engaging on data quality issues with the NCAs. At the core of the new approach are i) a data quality dashboard with indicators covering the most fundamental data quality aspects and ii) a data sharing framework which engages relevant authorities to follow up with counterparties in their jurisdiction upon a detection of a significant data quality issue, such as a breach of predefined levels in the agreed set of indicators. ESMA has supported the NCAs by centrally implementing the data quality dashboard for EMIR and by disseminating of the affected entity/transaction-level information to the NCAs. The framework has been triggered in 2022 for selected data quality indicators and early signs point out to substantial immediate improvements of data quality following the NCAs engagement with the relevant entities. In 2023, ESMA will implement an equivalent dashboard under SFTR. Details of the new framework are covered in section 3.

In 2022, ESMA has finalized its work on reporting guidance and technical documentation related to EMIR Refit which will go live in April 2024. ESMA has also followed on several significant ad-hoc data reporting issues pertaining to specific countries as well as continued its follow-up on findings stemming from supervisory projects. Both EMIR Refit and ESMA's TR supervisory work are expected to lead to a significant improvement in quality of the underlying data. Details of key developments in the context of EMIR and SFTR are covered in the section 4.1

As of 1 January 2022, ESMA became the supervisor of significant Authorized Reporting Mechanisms (ARMs) and Authorized Publication Arrangements (APAs)¹. With the new responsibilities, ESMA also began overseeing MiFIR transaction reports to assess the quality

¹ [ESMA identifies data reporting services providers to be supervised directly \(europa.eu\)](https://europa.eu)

of the data reported by ARMs and disclosed by APAs. ARMs report transaction data in the context of Art. 26(1) of MiFIR to NCAs (who in turn forward the data to ESMA). APAs are responsible for the publication of data for equity and non-equity transactions in the context of Art. 20-22 of MiFIR.

ESMA has leveraged on its years of experience with data-driven supervision of Trade Repositories (TRs) under EMIR and SFTR and has adopted equivalent approaches and analytical methodologies to the supervision of DRSPs. Section 4.2 of the report provides an overview of the reported data as well as examples of supervisory actions taken in 2022.

As documented in this report, ESMA concludes that the joint engagement by ESMA and NCAs on the improvement of the quality of transaction data, as well as the input of ECB and ESRB, have brought tangible and observable benefits for all data users, which in turn have enriched the data quality process with their own findings and observations. Today, authorities have better tools and better data to monitor the orderly functioning of markets and the evolution of the systemic risks to financial stability. Thus, the implementation of further targeted efforts must continue to be pursued and further enhancements across datasets should continue taking place to ensure the consistency, quality and reusability of data made available to ESMA.

2 Use of EMIR, SFTR and MiFIR transaction data

2.1 Introduction

Each of the respective transaction-level data reporting regimes plays 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 across the three major transaction-level regimes, the potential to leverage the data for various analytical uses cases is significant. This potential is then reflected in the number of use-cases and in-depth analyses carried out by ESMA, NCAs, ECB and ESRB. There are also various working groups that coordinate and promote the use of the data for variety of purposes at the inter-agency level.

While the majority of the analytical work needs to be performed “behind the closed doors” (largely due to the sensitivity of the underlying information) several publications that leverage on the data have been issued². Thus, even the wider public can obtain an insight into the variety of ways the data is used.

The aim of the following sub-sections is to provide a high-level overview of the most significant analytical use cases implemented by NCAs, ECB, ESRB and ESMA in their day-to-day work as well as in ad-hoc studies³. For the purposes of sub-section 4.2,

‘users’ broadly refers to NCAs, ECB and ESRB unless specified otherwise.

2.2 NCAs, ECB and ESRB

2.2.1 On-going monitoring of key trends in European derivatives markets

EMIR and SFTR are most often used to monitor overall trends and key market-level developments. EMIR and SFTR data are particularly useful for such purposes since the reported information is provided to the users in a way that enables the user to accurately capture current situation on the market through the so-called ‘Trade State Report’ which contains the snapshot of all open contracts on any given date. Users most frequently monitor market trends through fully automated dashboards with variety of breakdowns by types of market (exchange traded vs. over-the-counter), contract type, asset class, market participants (financials, CCPs) etc⁴.

2.2.2 Monitoring of derivatives exposures, market infrastructures and other financial markets participants

The EMIR and SFTR transaction-level of reporting enables users to monitor exposures on the level of industries, markets, as well specific firms. By way of an example, users have developed tools to monitor financial exposures of funds, CCPs, financial intermediaries and other financial

² Annex 5.1 provides a compiled list of publications leveraging transaction-level data published by the NCAs, ESMA and ESRB that ESMA is aware of.

³ The use-cases presented in this section have been compiled based on a survey run by ESMA. ESMA received responses from ECB, ESRB, Consob (IT), AMF (FR), AFM (NL), Bafin (DE), FMA (AT), Estonian FSA (EE), CNMV (ES) and CBoI (IA).

⁴ See for example report published by the AFM on the state of Dutch capital markets <https://www.afm.nl/~/profmedia/files/publicaties/2022/state-of-the-capital-markets-visuals.pdf>

markets participants and infrastructures⁵. Derived insights subsequently support prioritisation and decision making of senior management.

2.2.3 Detection and monitoring of market abuse behaviour

The transaction data reported under Art.26 of MiFIR aims at ensuring that investment firms act in a manner which promotes the integrity of the market. In In this regard, NCAs have over the years developed variety of automated tools and alerting systems to detect behaviours that could threaten integrity of markets under their supervision. Considering the sensitivity of the reported data and legal implications stemming from any behaviour that could constitute a market abuse, methodologies, tools and results of analyses are generally not being made public by the authorities.

2.2.4 Market and risk monitoring for specific segments and asset types

MiFIR transaction data have had other significant use cases beyond market abuse monitoring. For example, MiFIR transaction data has been used by NCAs extensively to assess the evolution of their market development. Among other examples, the AMF used transactions reporting to quantify systematic internalisers' activity and contribution in terms of pre-trading transparency and price discovery⁶, to assess the liquidity of the FR options' market⁷, or to regularly assess the evolution of the equity

market conditions⁸. Similarly, the transaction data reporting has been used to assess the impact of the 2020 short selling bans jointly by the AFM and AMF⁹.

Additionally, several NCAs have published studies of retail investor behaviour using MiFIR transaction data.¹⁰ Their findings and expertise in this area have contributed to ESMA work on retail risk indicators.

The data has also been used to monitor developments around emission allowances. The results of the analysis have been published in ESMA's dedicated report¹¹.

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 Europe¹².

2.2.5 Monitoring of reporting obligation

The users of data are also leveraging the information to monitor reporting obligations of market participants¹³. A variety of aspects is being monitored such timeliness and completeness of reporting, reporting of valuations and collateral information etc. Similar to the cases above, the monitoring is performed through the implementation of dashboards with indicators automatically flagging any issues in the above areas.

⁵ See for example reports published by the ECB on the role of speculation on EU emission markets: [The role of speculation during the recent increase in EU emissions allowance prices](#)

⁶ <https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/quantifying-systematic-internalisers-activity-their-share-equity-market-structure-and-role-price>

⁷ <https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/characteristics-french-equity-options-market>

⁸ See AMF Risk Outlook <https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/2022-markets-and-risk-outlook>

⁹ <https://www.afm.nl/en/sector/actueel/2022/februari/onderzoek-verbod-short-sell>

¹⁰ See e.g. AMF, 2020, "Retail investor behaviour during the COVID-19 crisis", April and FSMA, 2020, "Belgians trade up to five times as many shares during the coronavirus crisis", May

¹¹ [esma70-445-38 final report on emission allowances and associated derivatives.pdf \(europa.eu\)](https://www.esma.europa.eu/press-material/press-conferences-and-events/press-conferences-and-events/esma70-445-38-final-report-on-emission-allowances-and-associated-derivatives.pdf)

¹² 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-pf-of-venues.pdf

¹³ For example see report published by AMF with an overview of SFTR reporting in France <https://www.amf-france.org/en/initial-analysis-sftr-reporting-data>

Significant issues are followed upon by supervisors¹⁴.

2.3 ESMA

Transaction-level data is extensively used for the purpose of markets monitoring and macro-level research as well as support of policymaking and supervision/supervisory convergence mandates. ESMA makes regularly available various publications that provide context as to the extent of usage of the underlying data. The following subsections provides few examples of ESMA's reports and policy proposals.

Going forward and in line with its strategic objectives for 2023-2028, ESMA plans to further intensify and industrialise the use of transaction data and to explore innovative ways to obtain greater intelligence from the reported data. This will result in, inter alia, further benefits for the regulatory community as a whole.

2.3.1 Trends, Risk and Vulnerabilities report (TRV)

The TRV is ESMA's flagship report monitoring market-level risks to consumers, market integrity and financial stability risks that provides a comprehensive overview of key trends and risks in Europe¹⁵. EMIR, MiFIR (FITRS) and SFTR are among key data sources used to perform analysis of derivatives and securities financing markets. The report is published semi-annually.

2.3.2 Exposures of EU counterparties – Archegos

Thanks to its granularity, EMIR and SFTR data are particularly useful to analyse counterparty-level exposures. In this regard,

ESMA published an ex-post analysis of the default of Archegos, a US family office¹⁶. Even though the entity used mainly non-EU counterparties in the US and Asia, EMIR data showed that some European counterparties were also exposed to the firm through equity swaps. EMIR data allowed the analysis of the build-up of large positions by Archegos and its subsequent collapse.

2.3.3 Markets reports

Besides the TRV, ESMA also regularly publishes market reports (previously statistical reports) with extensive and highly granular statistical breakdowns and analyses¹⁷. Transaction-level, derivatives data, for example, reported under EMIR is the key source to produce the derivatives report. Indeed, the high granularity of the regime supports detailed and multi-faceted analyses. A market report on derivatives and securities markets is also regularly based on the FITRS (MiFIR) dataset. ESMA is also making use of SFTR data and intends to produce the first market report covering securities financing data in the near future.

2.3.4 Carbon markets and Derivatives Trading Obligation (DTO)

EMIR and SFTR data are also regularly used to support and inform policy-related decisions, such as in the context of ESMA's single rulebook activities. For example, transaction-level data have been extensively used in the context of ESMA's analysis of markets with emission allowances¹⁸ as well consultation on the DTO¹⁹.

2.3.5 Publication of CDS prices

Similarly, MiFIR information is used to provide clarifications in the reporting of certain fields, with the aim of improving the

¹⁴ For more details on the monitoring of reporting obligation please see section 3 of this report.

¹⁵ Example of 2h 2022 TRV: [ESMA Report on Trends, Risks and Vulnerabilities No. 2, 2022 \(europa.eu\)](#)

¹⁶ [esma50-165-2096 leverage and derivatives the case of archegos.pdf \(europa.eu\)](#)

¹⁷ Example of 2021 annual statistical report: [esma50-165-2001 emir asr derivatives 2021.pdf \(europa.eu\)](#)

¹⁸ [esma70-445-38 final report on emission allowances and associated derivatives.pdf \(europa.eu\)](#)

¹⁹ [esma70-446-369 consultation paper on co and dto referencing estr.pdf \(europa.eu\)](#)

consistency and usability of the information reported or published. An example of this use has been the "*price*" field for the reporting of credit derivatives, in particular credit default swaps. A detailed analysis of this field allowed to provide clarity on the expected form in which such information should be reported²⁰.

2.3.6 Firms under ESMA and NCAs 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 (such as TRs, ARMs and APAs)²¹ as well as to support NCAs supervisory mandates of reporting participants²².

2.3.7 Transparency data monitoring

ESMA has put in place measures to monitor the publishing time for transactions that fall under the reporting obligation of Articles 20 and 21 of MiFIR through Approved Reporting Mechanisms (APAs). This monitoring is done on a regular basis as part of ESMA's supervisory activity over APAs (as described in section 4.2.2) and also ad hoc in relation to policy developments (as described in section 4.2.4).

2.3.8 Retail risk monitoring

ESMA has published initial key retail risk indicators for the EU single market, based on transaction data from several NCAs.²³ More comprehensive and regular risk monitoring would require use of EU-level MiFIR transaction data.

²⁰ See section 4.2.3

²¹ See section 4.1.3

²² See section 4.1.2

²³ ESMA (2022), [TRV risk article on Key Retail Risk Indicators for the EU Single Market](#)

3 New approach to monitoring data quality

3.1 Introduction

Many of the core regulatory and supervisory activities of the authorities rely on the data reported and disclosed by market participants. This reliance, which has only been growing in the last decade with the progression of data-driven regulation and supervision, makes the high-quality data the cornerstone for efficient and effective fulfilment of the authorities' mandates.

NCA and ESMA have been undertaking extensive efforts to monitor and improve the quality of market data ever since the expansion of regulatory reporting requirements following the financial crisis. Over time, data quality action plans and engagement frameworks, in addition to other data quality activities performed at national level, have been agreed and performed on a periodic basis for all relevant supervisory reporting regimes. The experience gathered over the years allowed to identify the best practices, but also to recognise certain pain points where substantial efforts put by the supervisors did not consistently translate into an observable improvement in the data quality across all key data quality aspects.

Based on the lessons learnt, ESMA developed and agreed in 2022 a revised strategic approach to supervisory convergence work on data quality. The core elements of this approach were designed having in mind the paradigm of further strengthening the outcome-focused, data-driven, and risk-based nature of data quality activities. The agreed approach focuses on EMIR and SFTR as a starting point, but it is

envisaged that it will be extended to other datasets.

The following subsections introduce the two cornerstones of the new approach: the data quality indicators and the NCAs engagement frameworks. A practical example of how the results of the dashboard can be used to efficiently follow up on the data quality issues under the agreed framework is presented in the section 4.1.2²⁴.

3.2 Data quality dashboards

The first pillar of the new strategic approach is a comprehensive data quality dashboard to allow for a consistent monitoring of the evolution of the quality of a given dataset over time. The data quality indicators, when applied to a given country or reporting entity, allow to compare the quality of reporting against the EU benchmark. Furthermore, tracking of the entities' results over time can also be used to measure in an objective manner the effectiveness of the undertaken supervisory activities and the improved level of data quality.

The EMIR data quality dashboard was agreed in May 2022 and gradually implemented since then. The dashboard contains 19 Data Quality Indicators (DQIs) allowing to detect and measure various types of misreporting, including: under- and over reporting, inconsistent reporting vis-à-vis the other counterparty, incomplete information in the key fields of the reports, late reporting, abnormal values, and lack of correct identifiers of the counterparties.

²⁴ The data quality monitoring framework is an overarching framework for ESMA and NCAs. NCAs in some cases

implement their own national approaches and methodologies on top of ESMA's framework.

The DQIs are computed by ESMA on a monthly basis based on the entire EMIR dataset. The results are presented to and discussed with the NCAs experts. Significant reporting irregularities are followed up in a systematic manner under the agreed NCAs engagement framework. A similar dashboard for SFTR is currently under development. ESMA plans to implement the SFTR DQIs in the course of 2023.

3.3 NCAs data sharing frameworks

The second pillar of the approach is a common Framework for provision of data and follow-up on significant data quality issues. The main goal of the framework is to ensure that the resolution of the most critical data quality problems is performed as swiftly as possible and with an efficient use of NCA's and ESMA's resources. This is achieved by clarifying the role and responsibilities of NCAs and of ESMA as well as by setting out a clear procedure for the exchange of information and the follow-up.

In particular, the framework specifies the criteria to determine which reporting issues should be considered significant and prioritised as well as which entities should be targeted in the follow-up based on the quality of their reporting. The important feature of the framework is that the follow-up is focused on a limited subset of entities with the highest volume of incorrect reports at EU level, thus ensuring the most efficient use of the NCAs resources. Under certain circumstances individual entities may be approached, e.g. when they report abnormal/incorrect values on such a scale that it may materially impact the analysis of EMIR data, thus it follows a risk-based approach.

Furthermore, the framework sets out the timelines for the exchange of information between NCAs and ESMA, the format and minimum content of the statistics to be shared by ESMA and the feedback information to be provided by the NCAs to ESMA. Once the feedback from the NCAs is received, the framework envisages reassessment of the data to confirm if the problem is resolved or if any further actions are needed.

In the course of 2022, ESMA has launched the follow-up under the framework 4 times, on the following issues:

- Implausible notional/quantity and incorrect margins under EMIR (1 entity) – partially resolved (see section 4.1.2 for more details)
- Abnormal number of reports submitted by a single entity under EMIR (1 entity) – confirmed to be a correct reporting reflecting temporary shift in the trading pattern.
- Implausible loan values under SFTR (3 entities in one Member State) – partially resolved (see section 4.1.2 for more details)
- EMIR DQIs on discrepancies in the number of derivatives at trade or at position level sent by the two sides, outdated valuation, empty/abnormal maturity date and empty/zero valuation (67 entities in 18 Member States) – follow-up in course with substantial improvement already observed (see section 4.1.2 for more details).

4 Key developments impacting data quality

The following sub-sections provide an overview of key developments as well as supervisory actions impacting quality of data reported by TRs (EMIR and SFTR) and under MiFIR (ARM transaction data and APA transparency data).

4.1 EMIR data and SFTR data

4.1.1 EMIR Refit technical standards, guidelines, and technical documentation

Pursuant to the mandates set out in EMIR REFIT regulation²⁵ ESMA developed and published in December 2020 a set of draft technical standards on reporting, data quality, data access and TR registration. These technical standards were adopted by European Commission in June 2022 and published in the Official Journal of the EU in October 2022²⁶. The adoption of the technical standards provided full certainty about the content of the future rules as well as the go-live date – 29 April 2024.

In the meantime, since the finalisation of the draft technical standards, ESMA worked on the guidance and technical documentation to assist the industry with the implementation of EMIR REFIT. The final package including the Guidelines on reporting, XML schemas, validation rules, and reconciliation tolerances was published in December 2022. All these deliverables are expected to substantially contribute to the consistent implementation of the requirements by TRs and market participants and to the quality of the reported transactions.

In particular, the comprehensive Guidelines document will facilitate ensuring compliance with the revised rules by covering the most relevant aspects of reporting and data management, such as:

- General clarifications on a wide range of topics including transitional provisions, determination of reportability of a derivative, allocation of responsibility for reporting, lifecycle events model, reporting at position level, reporting of on-venue derivatives, timeliness of reporting, population of specific fields and sections in the report as well as ensuring data quality by the counterparties;
- Examples of reporting per product type and examples of reporting of different sections of fields in specific reporting scenarios.
- Clarification on data management by the TRs, including the construction of the Trade State Report, performance of the reconciliation process, provision of the data quality feedback and clarifications on data access.

From the perspective of data quality, it is particularly relevant to note the detailed clarifications on the methods and arrangements that the reporting entities should put in place to ensure data quality as well as the sections on data management clarifying the content of the data quality feedback (rejection reports, reconciliation reports and warnings) that TRs will need to

²⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0834&from=EN>

²⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2022:262:FULL&from=EN>

provide to the reporting entities and the authorities.

4.1.2 EMIR DQIs and dissemination of the results to NCAs

In section 3 we outline the revised strategic approach to supervision of data quality under EMIR and SFTR, which relies on two pillars: a comprehensive dashboard to monitor data quality, and the NCA's data sharing framework which provides a clear procedure for exchange of information and follow-up on significant data quality issues. In this section, we explore in more depth how the DQIs coupled with the NCA's data sharing framework have been used for data-driven supervisory actions in 2022 and how these actions led to observable improvement in the data proving the efficacy of said strategy²⁷. While at the moment of drafting this report certain remedial actions are still ongoing, the results of a first reassessment look promising and confirm the validity of the new approach.

4.1.2.1 EMIR DQIs and dissemination of the results to the 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 between October 2022 and January 2023. In this iteration, 5 DQIs were disseminated as part of the NCA framework based on their elevated significance.

Firstly, EMIR DQI 1, which concerns the discrepancies in the number of reported outstanding derivatives at trade level between two counterparties trading with each other²⁸. Such discrepancies hinder the

ability of authorities to obtain an accurate view of the relevant exposures of entities. Chart 1 depicts the evolution in the EEA-level results. The discrepancies fluctuated reaching a peak of 26.1% in September 2021 and since then a trend of gradual decrease has been observed which is a positive development.

In Chart 2 EMIR DQI 2 shows the discrepancies in the number of reported outstanding derivatives positions between two counterparties²⁹. Similarly to DQI 1, these discrepancies hinder the ability of authorities to obtain an accurate view of the relevant exposures of entities. It is evident that the percentage of errors has been decreasing over time, with some small fluctuations. The percentage of errors started at a relatively high level of 27.6%, but quickly decreased to 20.8%. The decline continued and reached a low of 7.8%. The fluctuations were relatively minor, with the percentage occasionally increasing slightly, but overall, the trend has been a consistent decrease in the percentage of discrepancies in positions reporting.

²⁷ As it can be seen in the charts in section 4.1.2.1, in some cases there have been positive trends that started prior to ESMA's new approach. Data quality has been a priority for ESMA since the start of reporting for each of the respective regimes and a large variety of initiatives (such as those described in detail in past iterations of the report) also contributed to an improvement in the quality of the data.

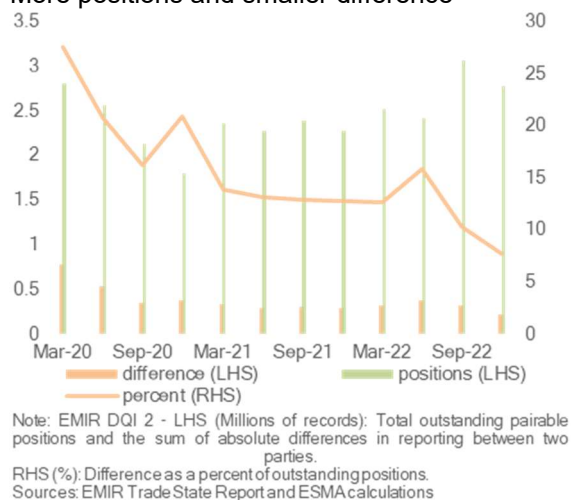
²⁸ Under EMIR, unless the second counterparty to the derivative is domiciled in non-EEA country, both counterparties have a reporting obligation. Both counterparties are then expected to agree on the way of reporting their derivatives (for example at transaction or position level). Therefore, one would expect that both counterparties report the same number of derivatives against the other counterparty.

²⁹ See footnote 15.

Chart 1
DQI 1 – Difference in trades reported
A persistent issue, requiring immediate attention by counterparties



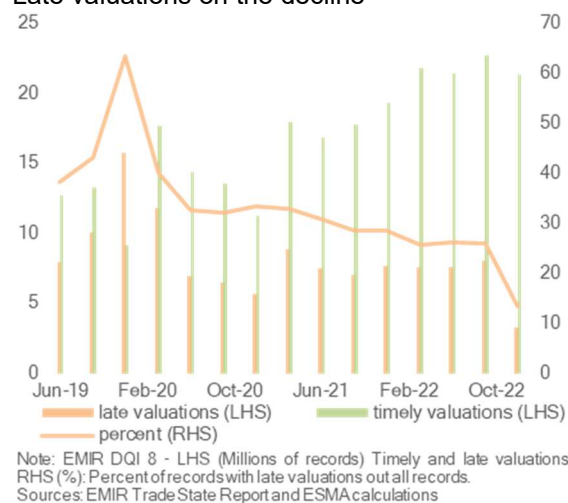
Chart 2
DQI2 – Difference in positions reported
More positions and smaller difference



In Chart 3, EMIR DQI 8 shows the number of outstanding derivatives with timely valuations and late valuations. Lack of up-to-date information on the valuation of outstanding derivatives limits authorities' capacity to monitor the exposure in a reliable manner. It appears that the percentage of late valuations exhibits a strong downward trend. The percentage of outstanding

derivatives with late valuations started at a relatively high level of 38.3% but started to rapidly decrease. The decline continued and reached a low of 13.2% in the latest observations. The overall trend has been a decrease in the percentage of late valuations, which is a strong signal of the work being done on enhancing data quality in EMIR. In turn the usability of the information on valuations, which is a critical piece of information for many users of the data³⁰, is improved.

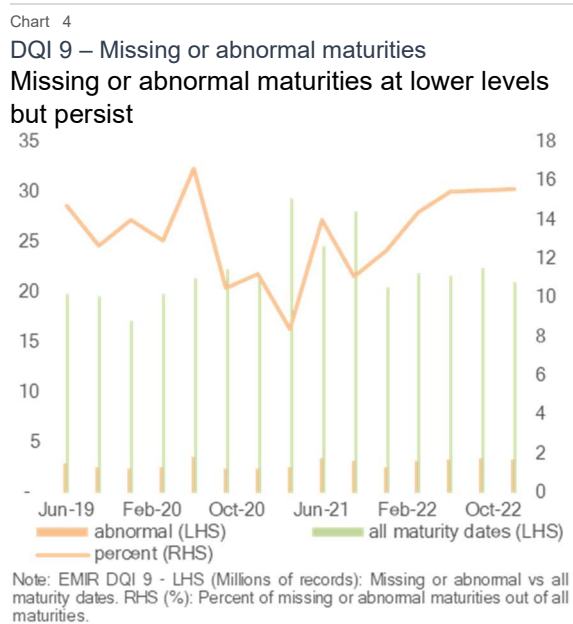
Chart 3
DQI 8 – Late valuations
Late valuations on the decline



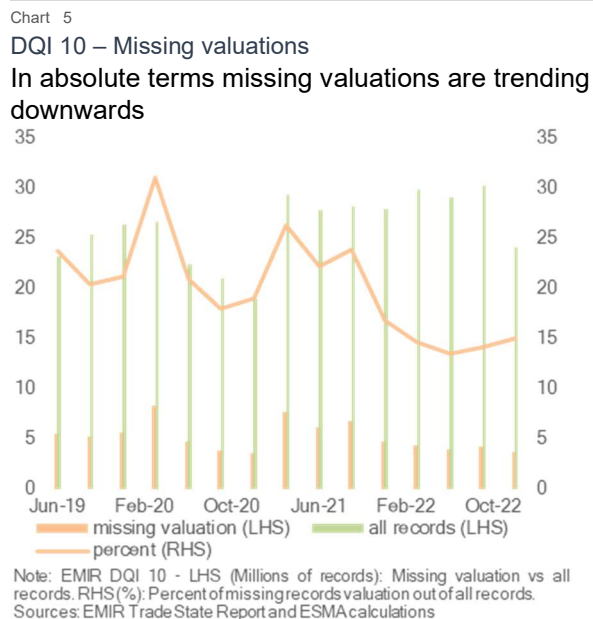
In Chart 4, EMIR DQI 9 shows the number of outstanding derivatives with missing or abnormal maturities (over 51 years). Missing or inaccurate information about the maturity date may lead to inaccurate assessment of exposures by counting expired derivatives as outstanding or vice-versa. It also renders unreliable estimations of the future evolution of the exposures. The percentage of outstanding derivatives with missing or abnormal maturities has been fluctuating, with no clear trend over a relatively narrow range of approximately 10% to 16%. ESMA will continue to monitor the trends on an ongoing basis and should there be no improvement soon it will engage with the

30 Issues with quality of reported information on valuations has been raised to ESMA by various data users such as the ECB and ESRB.

NCA's to conduct further follow up with the reporting counterparties.



In Chart 5, EMIR DQI 10 shows the number of outstanding derivatives with missing valuations. Incompleteness of this key data field has a direct impact over authorities' capacity to monitor the exposures. The percentage of outstanding derivatives with missing valuations has been fluctuating, with a general downward trend. The percentage of outstanding derivatives with missing valuation started at a relatively high level of 23.8% in 2019. By the year 2022 it has settled at an average of 14.3% for the year. The overall trend manifests a reduction in missing valuations. The improvement further underscores the usefulness of the new risk-based approach.



Overall, for all five DQIs an improvement in the absolute numbers of impacted reports has been observed between October 2022 (start of the coordinated exercise) and January 2023 (NCA's feedback to ESMA). The most substantial change has been observed in the case of DQI 8, which is also the DQI for which NCA's most frequently notified a resolution of the reporting issue by the counterparty.

A clear 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 NCA's reached out to 67 counterparties on 88 reporting issues³¹. As of end January 2023 the NCA's confirmed total or partial resolution of the reporting problem in 32 cases – out of which in 25 cases a substantial³² improvement has been confirmed in the data. Among 45 cases for which the resolution has not yet been confirmed, a substantial improvement has been observed

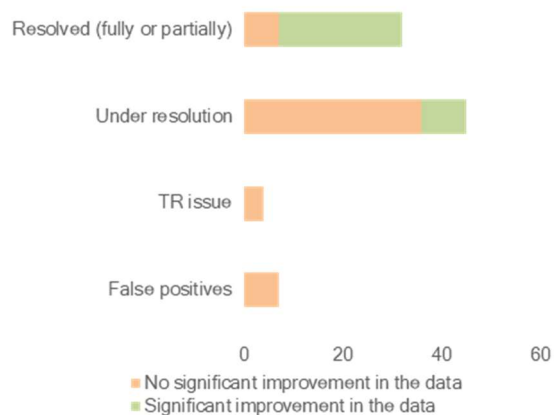
31 Some entities qualified for the follow-up under more than one DQI. Additionally, some DQIs require follow-up from both counterparties (and thus potentially an engagement from multiple NCA's in case of cross border issues) since the responsibility for a given issue cannot be clearly assigned in all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

32 '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 (October 2022 – January 2023).

in 20% of the cases. This partially positive outcome may be clarified by various factors such as first impacts of the remediation actions (not yet reported to ESMA) or a side benefit of the corrective actions undertaken by another counterparty where the two use the same Report Submitting Entity (RSE). The latter case was observed e.g. in a case of a Cypriot counterparty which resolved completely its reporting issue and a substantial improvement in reporting of a Dutch entity using same RSE, even if the latter has not been approached yet by its NCA.

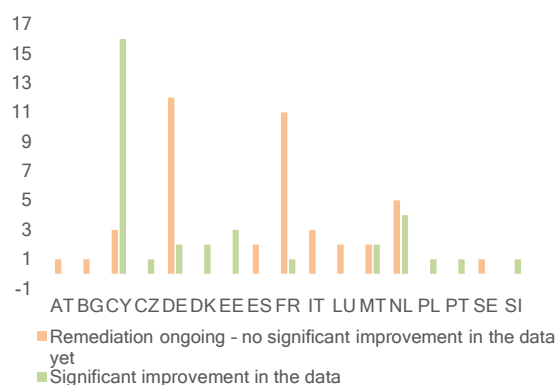
It is worth pointing out that there is a linkage between the level of activity of counterparties from a given Member State and the number of detected significant data quality issues.

Chart 6
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 DQI exercise.
Sources: NCAs feedback and ESMA calculations.

Chart 7
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.

4.1.2.2 Misreporting of notional/quantity and margins under EMIR

Following input received from the data users, ESMA has identified significant reporting issues of one entity with regards to the reporting of implausible values for the fields 2.20 'Notional' and 2.22 'Quantity' for commodity futures under EMIR. Further irregularities were observed for that entity also with regards to reporting of collateral:

- Internal inconsistencies in the collateral update reports,
- Inconsistency in collateral updates vis-à-vis the reports by the other counterparties.

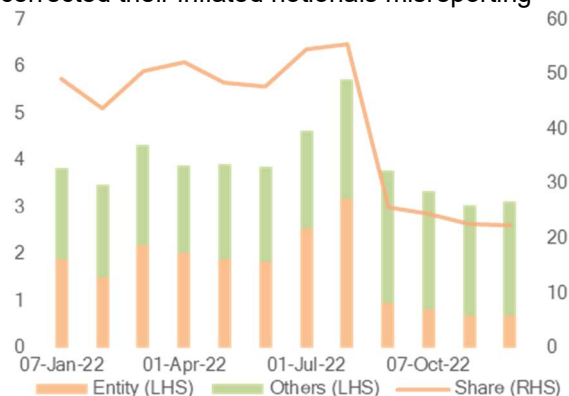
ESMA has reached out to the relevant NCA sharing the relevant data for the follow-up with the counterparty.

While the follow-up is still ongoing, the main data quality issue has been mitigated to a large extent, which is reflected in the normalisation of the reported notional amounts (see Chart 8). An improvement

has also been observed with regards to the collateral reporting.

Chart 8

Total notional value of commodity futures
Values normalise after Aug-22, as the entity corrected their inflated notional misreporting



Note: Commodity Futures Notional - LHS (EUR trillions); No distinction between counterparty side is made. Values calculation is subject to double-sided reporting. RHS (%): Entity's commodity futures notional as a share of the total commodity futures notional.
Sources: EMIR Trade State Reports (of the first Friday of each month).

4.1.2.3 Inflated loan values under SFTR

In the context of the analyses of SFTR data, ESMA has identified implausibly high values in the field 2.56 'Loan Value' reported for the securities lending transactions. When looking at the top 20 records in the TSR when sorted from largest to smallest, their loan value accounted for 77% of the total loan value (EUR equivalent).

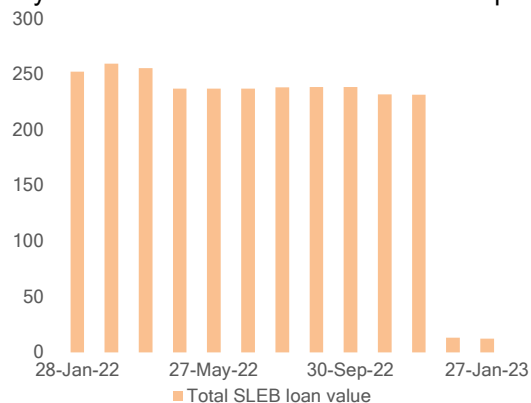
The reports concerned pertained to 3 entities from a single jurisdiction. Given the substantial impact of these records on the total aggregates ESMA has contacted the relevant NCA to confirm if the reported values are incorrect and, if so, to follow up with the counterparties concerned.

The NCA informed that all 3 entities confirmed misreporting and provided the resolution plans. While not all the fixes have been implemented yet, the follow-up has already resulted in a material improvement in the data (see Chart 9)

4.1.3 Remediation of issues identified in

Chart 9

Total loan value of securities lending/borrowing
Values normalise after mid-December 22, as an entity corrected its inflated loan value misreporting



Note: Total SLEB loan value - LHS (EUR trillions); No distinction between counterparty side is made. Values calculation is subject to double-sided reporting.
Sources: SFTR Trade State Reports (of the last Friday of each month).

EMIR supervisory reviews

4.1.3.1 TAR vs TSR comparison

The incorrect incorporation of the information contained in the TAR into the TSR is one of the key TR data quality issues identified by the NCAs. ESMA conducted in 2021 a dedicated project for the comparison of the TAR and TSR data, in particular, for the assessment of the completeness and accuracy of the TSR as an aggregation of individual TARs.

The project methodology was based on the comparison of two EMIR TSRs received from the TRs one week apart. The information collected in the first TSR is dynamically updated with the successive TARs received in the period between them. This results in a calculated TSR which is compared with the second TSR submitted by the TR. By comparing the two files, it is possible to detect quality problems related to the incorrect incorporation of the information into the TSR.

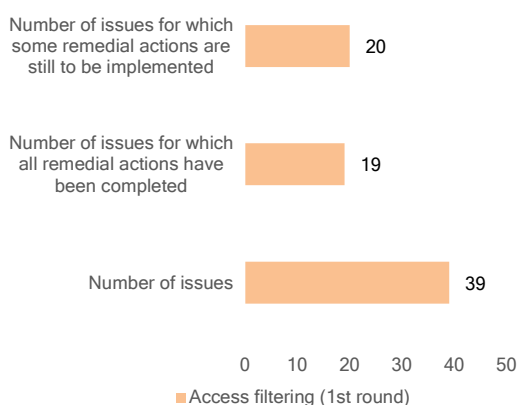
It has been found that, in general terms, there was a correct incorporation to the TSR

of the derivatives reported in the TAR. The conclusion that the integrity of both reports is maintained underlines the point that both reports can be relied upon for subsequent analysis by the NCAs and other users. Moreover, the project has allowed the implementation of a verification framework for this process that can be replicated and increased in the future.

Regarding the completeness analysis, which consisted in the detection of missing trades or trades incorrectly included in the TSR generated by the TRs, the project revealed some areas where further policy clarifications were needed. For instance, it has been found that some TRs were excluding trades from the TSR when their maturity date was falling on the same day as the generation of that TSR. ESMA has since issued relevant policy clarifications to the attention of the impacted TRs. Some common behaviours have also been identified by ESMA around the unexpected use of different action types to reopen trades.

The outcomes of this project have been presented to the TRs and detailed results shared individually. ESMA acknowledges the efforts made by TRs to process the data and make their own analysis, to identify the root causes for the discrepancies or inaccuracies identified. For the findings with root causes clearly identified and confirmed by TRs, remedial actions have already been agreed with ESMA and are in the process of being implemented. ESMA is following up with TRs on the remaining issues.

Chart 10
Remediation of issues – Access filtering



Note: Number of issues grouped by remediation status. No distinction between TRs is made.
Sources: ESMA calculation

4.1.3.2 EMIR regulatory access filtering

When providing data to the authorities, TRs apply filtering rules to make the data available to authorities based on their respective mandates. This is important to avoid that an authority receives data which it is not entitled to and to ensure that each authority receives all the data that it requires to fulfil its mandates.

The project used a data-driven approach which showed that TRs seem to broadly follow the regulatory requirements with regards to provision of data to authorities in accordance with their mandates specified in EMIR. Despite the overall satisfactory outcome, a few shortcomings were detected which resulted in either underreporting or overreporting of EMIR data to authorities.

ESMA has been following up on the remediation of issues by TRs and at the same time planning to reperform the analysis during 2023 involving other NCAs and Central Banks. ESMA also leveraged on the outcomes of this project to include further policy clarifications on the provision of access to authorities in the EMIR Refit Guidelines.

A second round of analysis has already been launched by ESMA, based on the same methodology and with a new sample of authorities contributing to the project. ESMA will use this opportunity to also verify implementation of remedial actions by TRs.

4.1.3.3 EMIR TR data ingestion

Following the completion of the EMIR Data Ingestion project, which consisted of a data-driven approach to assess the extent of data quality issues arising during the data ingestion processes of TRs, ESMA identified a total of 10 issues which were communicated to the relevant TRs in the form of a remediation action plan.

ESMA discovered a range of discrepancies between the information submitted by counterparties and how it had been stored in the TRs' internal databases. Most were of a non-critical nature and could be explained by the way the TRs' have implemented their internal IT systems. For example, rounding errors of decimal values, date/time formats and other misalignments which did not have a critical impact on data quality when TRs generate outbound reports for regulatory authorities. A few critical issues caused by inappropriate modification of counterparty data were also detected.

For seven of the issues identified, ESMA had not observed any material impact on the data quality at the time of the review, the risk being managed by the logic of the current TR system. In addition, the risks that these issues are introducing to the system are expected to be removed with the REFIT implementation, for which the data ingestion will be redesigned. Therefore, no specific remedial action was required at this stage. The remaining three issues are to be resolved by March 2023, with at least one already implemented.

4.1.4 Wind-down of UnaVista under SFTR and porting of data to other TRs

In August 2021, UnaVista initiated the wind-down process of its SFTR TR as a result of a decision to not continue to provide these services.

UnaVista started the porting out process of outstanding SFTs in November 2021. By late January 2022 all outstanding SFTs were ported out to the new TRs and by March 2022 the transfer of the remaining SFT data was finalized. Upon completion of all actions set out in its wind-down plan, ESMA withdrew the registration of UnaVista under SFTR in September 2022.

Through continuous monitoring, follow-ups with UnaVista and the involved TRs, and

quick resolution of the encountered issues, ESMA ensured that the wind-down activities did not lead to any interruptions in the continuity of the provision of regulatory reports to all data users.

4.1.5 Adherence to SFTR format and content rules – ESMA revalidation

The revalidation process carried out by ESMA is a crucial step in maintaining the accuracy and reliability of the SFTR data provided by Trade Repositories (TRs). This process involves evaluating the compliance of TRs with the validation requirements set by ESMA. To achieve this, ESMA has developed tools that enable the analysis of Trade Activity Reports.

The revalidation process checks the mandatory nature of the fields for each combination of Action Type and, where applicable, Level (Trade/Position), to make sure that all the required information is provided. Additionally, it assesses the conditional validations, which are validations of the dependencies between fields, to ensure the coherence of the data. The format and content of fields are also examined during the revalidation process to confirm that the data conforms to the established standards.

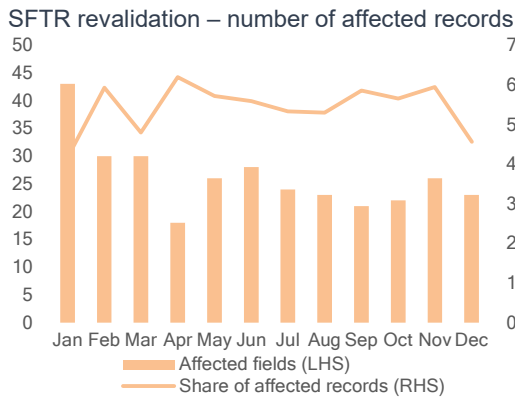
In the event that significant issues are identified during the revalidation process, ESMA engages with the relevant TR to resolve the problem. This iterative approach helps to maintain the high level of accuracy and reliability of the SFTR data and ensures that TRs are in compliance with the validation requirements set by ESMA.

To gain an understanding of the revalidation process and its effectiveness, ESMA conducted an analysis of one Trade Activity Report (TAR) per month, as of mid-month, over the course of 2022.

The results of the analysis are displayed in Chart 11 which shows the percentage of

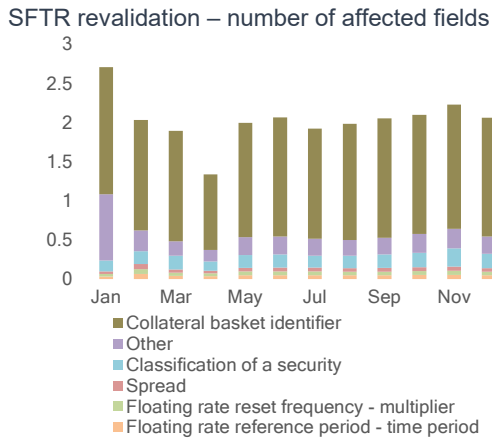
errors identified during the revalidation process. Throughout the course of 2022, the proportion of records with errors, out of the 2.2 million rows processed on average per iteration, remained relatively stable, averaging 5.4%. The number of fields impacted by failures varied from 23 to 43, with 5 fields accounting for approximately 95% of the total failures (see Chart 12). ESMA intends to follow-up with TRs to fix the issues related to these problematic fields.

Chart 11



Note: SFTR revalidation - LHS: Number of fields affected per report. RHS (%): Total share of affected records per report.
Sources: SFTR Trade Activity Reports (as of mid-month) and ESMA calculations.

Chart 12



Note: SFTR revalidation - total number of affected records (in millions) per field.
Sources: SFTR Trade Activity Reports (as of mid-month) and ESMA calculations.

4.2 MiFIR data

Data Reporting Services Providers (DRSPs) are entities introduced by MiFIR³³, 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 transparency data under MiFIR. Their main purpose is to provide market participants with visibility of the depth and 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)**, provide a consolidated view of market data from multiple trading venues and APAs under MiFIR. They collect real-time data and consolidate it into a single, comprehensive view of market activity and prices.

There are currently no Consolidated Tape Providers (CTPs) operating under the MiFIR framework. Therefore, only Approved Publication Arrangements (APAs) for transparency data and Approved Reporting Mechanisms (ARMs) for transaction data exist.

4.2.1 ESMA becomes the supervisor of significant DRSPs

The supervision of DRSPs was the exclusive responsibility of NCAs until December 2021. However, due to the cross-border nature of MiFIR data and the need for improved data quality convergence across the EU, starting 2022 ESMA was designated as the direct supervisor of the most significant DRSPs, while those with a more limited market impact will remain under the jurisdiction of NCAs.

ESMA performs yearly the assessment of the market significance of each DRSP based on regulatory criteria³⁴; considering the cross-border activity and the volumes of transactions reported or published by each entity.

Following the results of the 2022 assessment, nine DRSPs³⁵ are directly supervised by ESMA due to their relevant

³³ The definition of DRSP can be found in MiFIR – Article 2 points (34) to (36a)

³⁴ The criteria for the identification of DRSPs to be derogated from ESMA's supervision are listed in the Delegated Regulation 2022/466 – Art.2

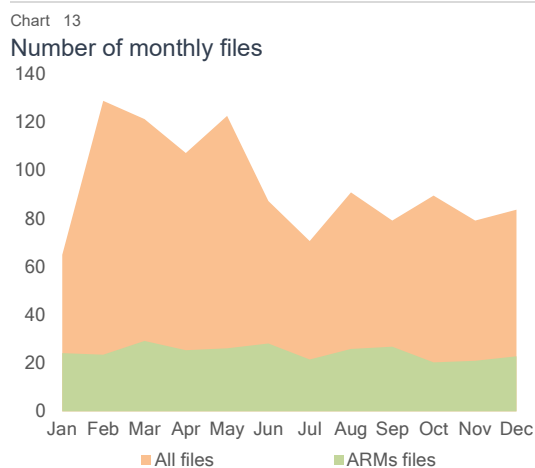
³⁵ ESMA published in 2022 a news item announcing the list of DRSPs to be directly supervised. Further information regarding the full list of DRSPs authorised in the EU can be found in the ESMA Registers. ESMA published in 2022 a news item announcing the list of DRSPs to be directly supervised. Further information regarding the full list of DRSPs authorised in the EU can be found in the ESMA Registers

market activity in the EU. In summary, they represent almost 99% of the transactions reported among registered ARMs under article 26 of MiFIR and more than 99% of the transactions published by APAs.

Likewise, for the other types of supervised entities, ESMA adopted a risk-based and data-driven approach when supervising APAs and ARMs, which consists of the identification of vulnerabilities in the areas of DRSPs' business model, internal organisation, IT systems, and data quality.

During 2020 and 2021, ESMA established all the necessary internal systems and processes to facilitate a smooth transfer of responsibilities from National Competent Authorities (NCAs). ESMA created a substantial IT infrastructure, leveraging big-data technologies, to access and analyse transaction reports submitted to NCAs. This system is also utilized for re-validating transaction data and requires ongoing collaboration with NCAs. It serves to monitor the completeness, integrity, and timeliness of reporting by Approved Reporting Mechanisms (ARMs).

The information processed in this infrastructure is received directly in files from the NCAs. These files, which undergo checks to minimise data quality issues, contain detailed information on the transactions reported by all entities subject to reporting under Article 26 of MiFIR. On average, around 3100 files are processed daily. The chart presented below shows the evolution in the number of files received from all NCAs and the volume of those reported by ARMs under ESMA supervision³⁶.



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

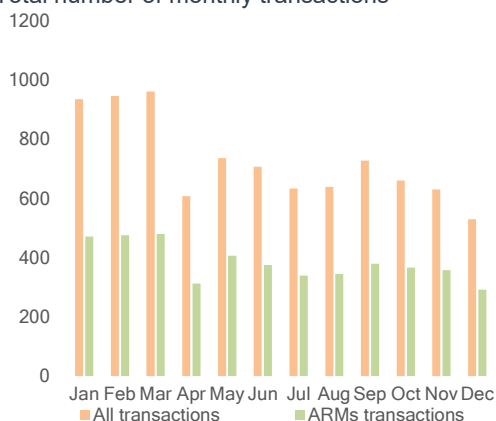
Regarding the volume of transactions, some volatility has been observed, mainly during the first quarter, stabilising at monthly volumes of around 650 million transactions thereafter. The graph below shows the total volume of monthly transactions executed and reported (based on the trade date) and the volume of these transactions corresponding to reports made by the 6 ARMs under ESMA supervision. ARMs are responsible, on average, for more than 50% of the total number of transactions reported under article 26 of MiFIR³⁷, with the remaining transactions being reported directly by investment firms or trading venues.

³⁶ Given that the project was rolled out during 2022, there are certain CAs that have not yet reported in full. ESMA receives all transactions data from the NCAs including those not reported by ARMs such as by investment firms.

³⁷ Note that the percentage of files is lower than the percentage of transactions for ARMs with respect to the total. This is due to the fact that, in general, the files received from these entities contain a higher number of transactions.

Chart 14

Total number of monthly transactions

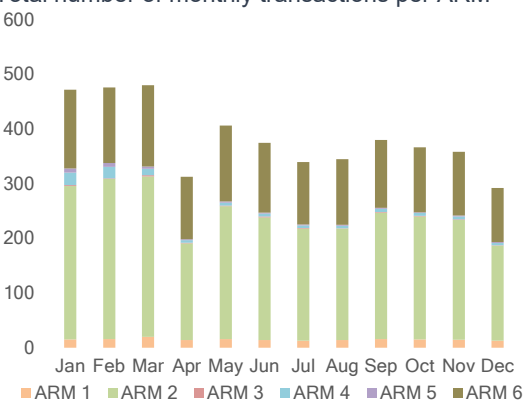


Note: Total number of monthly transactions (in millions), grouped by execution date. Sources: Transaction Reports received under MiFIR article

A detailed analysis of the reports made by the 6 ARMs supervised by ESMA reveal the distribution of volumes among them. Thus, two entities report a high percentage of the total transactions, with the rest of them sharing the remaining volume more evenly.

Chart 15

Total number of monthly transactions per ARM



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

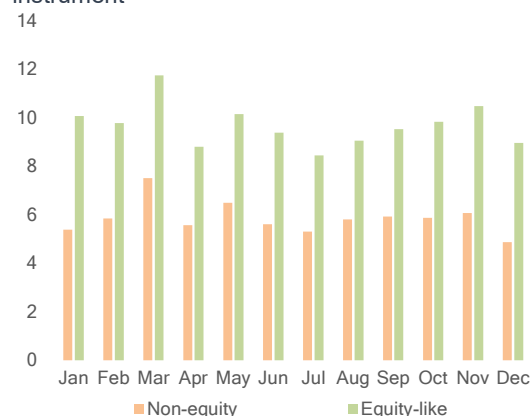
Additionally, DRSPs have been requested to provide aggregate monthly statistics on APA's and ARM's volume. This information allows ESMA to cross-check with other available datasets (e.g., transaction and transparency data) and to gather supplementary information not available from other sources (e.g.,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

All this information supports ESMA in the execution of its supervisory program, which consists of periodic activities and ad-hoc reviews. As for the periodic component of the program, ESMA monitor on an on-going basis the completeness, availability, integrity, and timeliness of transactions reported by ARMs and published by APAs. Alongside the periodic detection of data quality issues affecting DRSPs' activity, ESMA has initiated an ad-hoc supervisory project to assess the consistency between transaction and transparency reporting by comparing APAs and ARMs data. Among other metrics, the periodic information allows to monitor the volume of transactions published by the APAs.

Chart 15 displays the monthly aggregate number of transactions published per type of instrument (non-equity, or Equity-like). There is a stable and consistent volume of transactions disclosed for each instrument type.

Chart 16

Number of monthly transactions by type of instrument

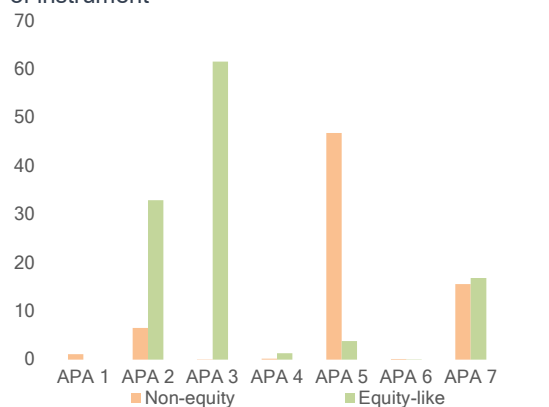


Note: Number of monthly transactions (in millions) by type of instrument. Sources: Periodic reporting from supervised entities.

Chart 16 shows the number of transactions published by each APA per type of instrument, non-equity, or equity. The data shows diversity in both the number of transactions published and the significance of the type of instrument among APAs, which

is indicative of varying business models of APAs.

Chart 17
Number of published transactions per APA and type of instrument



Note: Number of published transactions (in millions) per APA and type of instrument. APAs are anonymised.
Sources: Periodic reporting from supervised entities.

4.2.2 Timeliness of publication (APA)

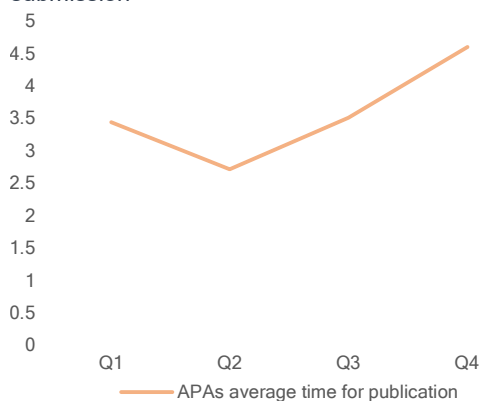
The timely publication of accurate and complete transaction data by Approved Publication Arrangements (APAs) under the MiFIR framework is essential for both transparency and the integrity of financial markets.

The swift dissemination of this information allows market participants to make informed decisions, thereby promoting the fair and efficient functioning of financial markets.

ESMA has the responsibility of ensuring that APAs under its supervision meet the required timeliness standards for publication. To that end, ESMA requested the submission of periodic statistics on the timeliness of publication by APAs, as a means of enhancing its monitoring efforts. One of these metrics is the average time it takes APAs to publish trades from the time of receipt. Chart 18 illustrates the quarterly average for non-deferred trades, which shows fluctuations, but the overall level indicates that trades are published promptly (within seconds) upon receipt by APAs. From a supervisory perspective, it means that there is a minimal delay in the dissemination

of trade information to the public. This helps ensure that market participants have access to timely information, which can help promote transparency and integrity in the market.

Chart 18
APAs average number of seconds to publish from submission



Note: APAs average time (in seconds) to publish from submission throughout 2022.
Sources: Periodic reporting from supervised entities.

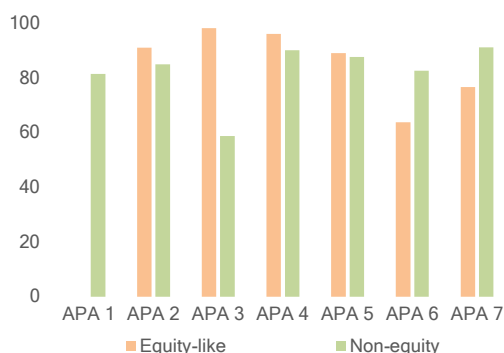
MiFIR establishes specific time frame requirements for publishing transactions and sets different deferral periods depending on the type and characteristics of the asset. ESMA has asked the APAs to regularly calculate the percentage of trades that are made public within these established time frames. Chart 19 displays the average in 2022 for both non-equity and equity instruments. The data shows that the percentage of records published on time ranges from 59% to 91% for non-equity instruments and from 64% to 98% for equity instruments. While the trend is increasing, as it can be appreciated, the overall number is extremely small, i.e. APAs are publishing almost immediately (within seconds) after receiving data from their clients.

ESMA uses this information to monitor the performance of APAs and assess their ability to comply with the rules and standards set in MiFIR. The differentiation between non-equity and equity instruments provides further insights into the APAs' performance

and can help ESMA identify potential areas for improvement.

Chart 19

Percentage of non-deferred trades made public within the required timeframe by financial instrument



Note: Shares of non-deferred trades (%) made public within the required timeframe by financial instrument.
Sources: Periodic reporting from supervised entities.

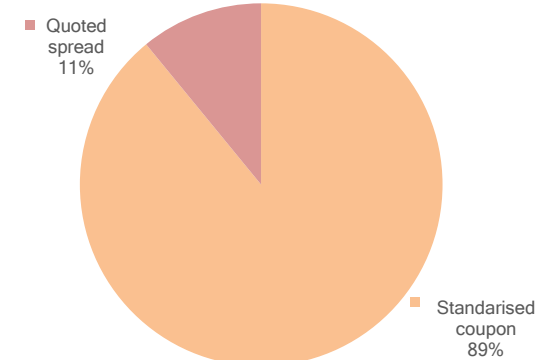
4.2.3 Insights from the analysis of CDS prices

Both transaction and transparency information under MiFIR have been used to support the analysis of future modifications (e.g. MiFIR review) or clarifications (e.g. Manual on Post-trade Transparency) on the reporting of certain fields to improve the consistency and usability of the information published. An example of this has been the "price" field for the reporting of credit derivatives, in particular credit default swaps. Analysing a subset of information extracted directly from the APAs reporting under MiFIR Article 21, it was found that most APAs currently report the price of CDS as Basis Points (as set out in the regulation) although in many cases entities reflect in this field the "standardised coupon" (100 Bps or 500 Bps), instead of reflecting market conditions by reporting the "quoted spread". An equivalent analysis was performed for transaction information (under MiFIR Article 26). In this case, a subset of 260K CDS was taken, of which around 200K were reporting the price as Basis Points, of this figure, around 90% of the trades were reported with a standardised

coupon, instead of the quoted spread, as reflected in the chart below. The analysis of this information will allow ESMA to clarify the expected values for the industry and avoid inconsistencies in the reported information.

Chart 20

CDS price in Basis Points



Note: shares of CDS prices reported in basis points with and without a standardised coupon.
Sources: transaction reporting under MiFIR Article 26.

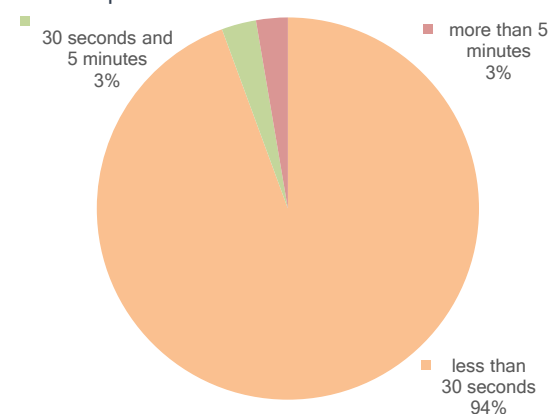
4.2.4 Publication of transparency data by Systematic Internalisers (SIs)

ESMA has established mechanisms to monitor the time required to make public the details of transactions subject to reporting through APAs under articles 20 and 21 of MiFIR. This monitoring has been carried out on a recurrent basis for the ongoing monitoring of APAs under ESMA's supervision (details can be found in section 4.2.2) but also on an ad hoc basis for specific analyses related to policy developments.

An example of the latter type of analysis was carried out on a subset of transactions in instrument type "shares". By extracting data published by APAs directly for one week, the difference in seconds between the Execution and Publication Timestamp was analysed. The data was treated to get a consistent dataset (e.g., instances where the execution and publication date were different and outliers were omitted in the analysis) and split between the total number of trades and the subset reported by Systematic Internalisers. In both cases, it was observed that the time needed to publish this type of instrument is, in general terms, very low. A

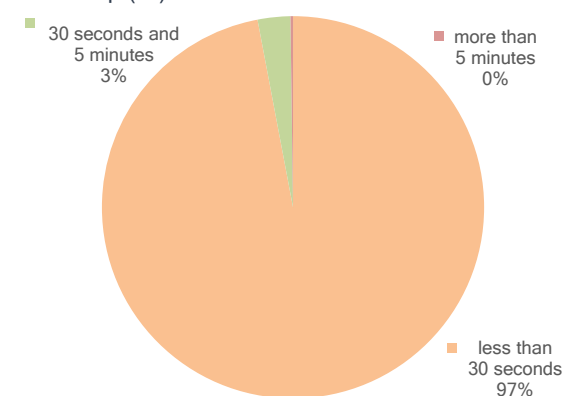
percentage of around 90% of them are published in less than 30 seconds from the moment of execution, as can be seen in the graph below. The ability to make transactions available relatively short time indicates that market participants are capable of making transaction data available at real-/near-real time basis.

Chart 21
Percentage of transactions of grouped difference in seconds between execution and publication timestamp



Note: Percentage of total transactions grouped by difference between execution and publication timestamp.
Sources: APAs reporting on instruments transactions type "shares".

Chart 22
Percentage of transactions of grouped difference in seconds between execution and publication timestamp (SI)



Note: Percentage of transactions grouped by difference between execution and publication timestamp. Trades are reported by Systematic Internalisers (SI) only.
Sources: APAs reporting on instruments transactions type "shares".

4.2.5 Lessons learnt from the analysis of MiFIR transaction data for the carbon markets report

In the context of the Carbon market report³⁸, the analysis based on MiFID transaction reports under Art.26 of MiFIR provided an important insight on trading in emission allowances executed in second half of 2021 and illustrates its market complex developments.

The data analysed in the context of the EU carbon market report came from a variety of data sources, including EU auction reports, EMIR reports, MiFIR transaction reports, MiFIR instrument reference data, and weekly commodities position reports as well as Union Registry settlement data. The analysis carried out by ESMA was unprecedented and brought to light the multiple challenges associated with reconciling those various data sources to have a comprehensive view of the carbon market. For example, for the assessment of volumes, frequency of the trading, sectors and instruments details it was needed to enrich and combine the data set with information gathered from other sources³⁹ (e.g. maturities, price, country allocation and sector classification). At transaction reporting level, it was not possible to directly derive the information for classifying the origins of counterparties to obtain a comprehensive picture of the trades, therefore the different counterparty classifications were retrieved from a consistent analysis run across the different

³⁸ ESMA07-445-38

https://www.esma.europa.eu/sites/default/files/library/esma70-445-38_final_report_on_emission_allowances_and_associated_derivatives.pdf

³⁹ ANNA, MiFIR reference data (FIRDS), GLEIF and ESMA counterparty data based on EMIR TR data and public registers of counterparties.

processed datasets⁴⁰ that defined a common list of groups of counterparties applied for the overall carbon market analysis.

The assessment performed by ESMA was particularly unique and challenging due to the unavailability of transaction data that was exclusively collected and stored in the NCAs' databases at the time when the analysis was started. Therefore, considering the impossibility of carrying out the analysis on the basis of one central database at EU level, the EUA data in scope have been provided by 3 NCAs (BaFin, AFM, NOFSA) and were representing the most relevant data set and markets for the reference period under observation (from June to December 2021).

It is important to highlight that following the application of the new provisions under Art.26(1) MiFIR in force from January 2022, ESMA has started to have direct access to all MiFIR transactions, and the above limitations will not be longer be present in the ongoing monitoring and the processing of further analyses. Several other analytical limitations and policy gaps emerged in relation to the processing and the assessment of the available transaction data sets, in particular complexities such as: duplicate buy-sell chains of reported transactions and the aggregation of the data that required an elaborated data processing and harmonisation; and subsequently, the implementation of a complex and stepwise methodology. These challenges enabled ESMA to gain experience with the analysis of MiFIR transaction data and to support policy developments to improve the MiFIR transaction reporting framework.

Despite the transversal challenges, the final outcomes were essential to further deepen the understanding of the emission allowance market structure and activities of firms. In particular, the MiFIR transaction reporting

dataset provided further comprehensiveness of the EUAs, derivatives thereof, and other relevant instruments compared to the information that are not available in EMIR and reflect the changes of market in the context of the actual post Brexit scenario.

The analysis highlighted further the wider scope of transaction reporting allowing also the detection of those instances of executed transactions in EU venues where both involved counterparties are no-EU, cleared outside the EU and that are not visible in the EMIR reported dataset. This essential source of information is available as the result of the trading venues' reporting obligations according to Art. 26 of MiFIR. In particular, it was also possible to monitor the actual trading activity of UK counterparties that was not accessible before the application of Brexit as the transactions were exclusively reported by the investment firms to the relevant UK NCA. This also implies more visibility on the transactions in the spot market, due to the overall scope of MiFIR Art. 26.2 that, unlike EMIR, also covers non-derivatives instruments.

Regarding the above reasons, the data period analysed was selected in order to also assess the impact of the migration of the carbon market from UK to Netherlands following the relocation of some market participants and trading venues. From the analysis emerged that 88% of the transactions were executed in ICE Endex venue.

MiFIR transaction data proved to be essential for the assessment of the overall size of the EUA markets. It emerged that trading in the secondary market between June 2021 and December 2021 averaged EUR 57 billion per month and 94% of

⁴⁰ Approach and details are in section 4.3.2 of the Carbon market report https://www.esma.europa.eu/sites/default/files/library/esma70-445-38_final_report_on_emission_allowances_and_associated_derivatives.pdf

transactions in EUA were executed on trading venues.

From the data it was possible to retrieve figures in terms of volumes and trading activity with a focus on breakdowns per sectors and highlight their evolutions over the reference period under analysis. The report allowed to conclude that no major anomalies or issues were associated to the correct functioning of the EU carbon market from a supervisory perspective. On the basis of the analysis performed and the analytical conclusions, ESMA has identified some targeted policy measures that would help addressing the challenges identified, contribute to enhanced market monitoring of the EU carbon market and assist with a better understanding on how the EU carbon market develops.

4.2.6 Consistency of transaction and transparency data

During the second half of the year, ESMA has started a project aimed at evaluating the consistency between the transaction information published under Article 26 of MiFIR and the transparency information published under Article 20 and 21 of the same regulation.

To achieve this, two sets of data have been used. On the one hand, the transaction information, covering ARM and TV data, reported directly by the NCAs to the ESMA platform, and on the other hand, the transparency information published by the APAs on their websites. In this regard, mechanisms have been established to connect to these websites and obtain the information published by the APAs under ESMA supervision.

The objective of the project, which will be completed in 1q2023, is to analyse both sets of data to determine if the information is consistent (i.e., if the information that should be present in both is actually found) and to

identify any gaps in terms of completeness in either domain.

Although the ultimate goal of the project is to analyse the consistency of both data sets, other relevant aspects related to the quality of the data have also been analysed. Accessibility, standardization, and adequacy of reporting to the regulatory framework are being reviewed. The findings from this project will be transmitted to the DRSPs for correction.

4.2.7 APAs Transparency data outliers

Following the entry into force of MiFIDII and MiFIR in January 2018, ESMA began to collect reference and quantitative transparency data via the Financial Instruments Reference System (FIRDS) and the Financial Instruments Transparency System (FITRS). This data supports the calculation and publication by ESMA of the transparency calculations for equity and non-equity instruments as required under MiFIDII / MiFIR.

Since that moment, ESMA staff have monitored the quality of the data received through both systems performing different data quality tests. The results of such tests were transmitted to the NCAs for resolution. As mentioned in Section 4.2.1, starting from January 2022, ESMA became the direct supervisor of seven APAs, taking up the role of the respective NCAs in the resolution process.

In particular, a specific test on bond instruments verifies that the average daily traded volume of the instruments is in line with the ones of similar products in the same market, flagging as outliers those that have an average trade size over 30 standard deviations above the mean of the other records belonging to the same MIC and Bond Type, and having a total traded daily volume of over 100 million euros.

The analysis also performs a second check on instruments denominated in foreign currencies by flagging those for which the monthly average trading volume exceeds the total nominal amount.

During the resolution process, ESMA contacted its supervised entities to verify which of the flagged outliers were false positives. Thanks to this analysis and follow ups, several outliers were excluded from the transparency calculations in both equity and non-equity instruments and two major reporting issues were identified with two distinct APAs.

These issues occurred since the reporting start date of the reference and quantitative transparency data in 2018 for both entities. While one issue was due to a misconfiguration of the APAs' IT systems, the other one was caused by the use of incorrect third-party reference data. Such misreporting was causing inflated or deflated volumes that were excluded from the transparency calculations when such volumes were identified as undeniable outliers. Both issues were completely fixed by the beginning of 2023.

The impact of this has not been fully yet estimated at ISIN level and in the context of the transparency publications. However, ESMA carried out a preliminary analysis to understand how much inflated and deflated volumes were corrected in relation to data reported from 2020 to 2022.

The charts below show the positive and negative corrections in terms of volumes in EUR performed by the two APAs. Positive corrections refer to volumes originally reported with a deflated value while negative corrections refer to volumes originally reported with inflated value.

Chart 23
APA1 Positive corrections – Volumes

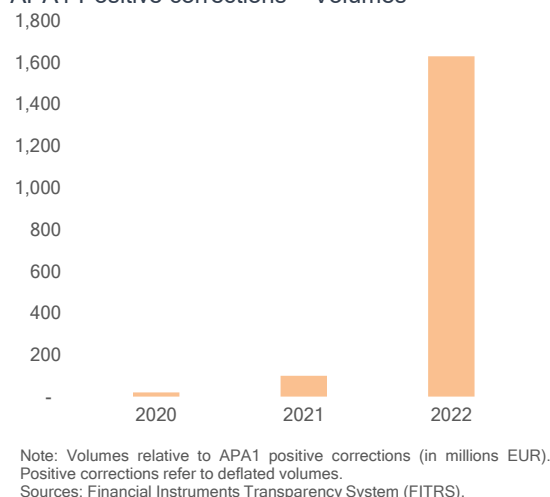


Chart 24
APA1 Negative corrections – Volumes

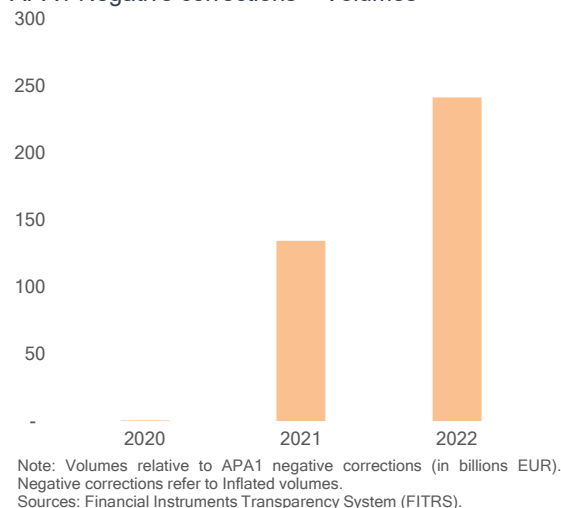
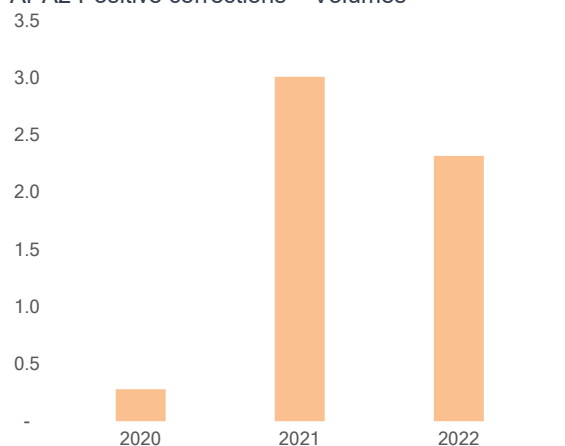


Chart 25

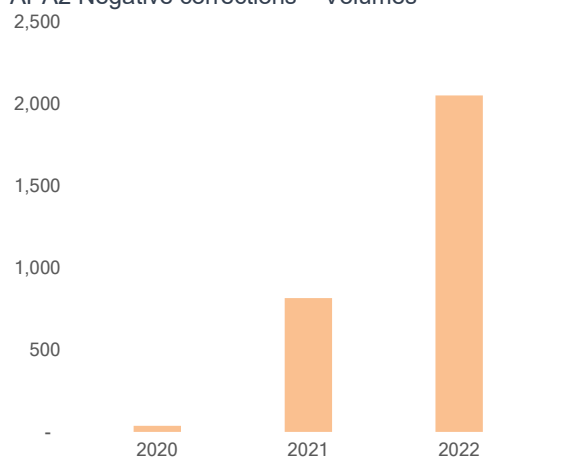
APA2 Positive corrections – Volumes



Note: Volumes relative to APA2 positive corrections (in trillions EUR). Positive corrections refer to deflated volumes.
Sources: Financial Instruments Transparency System (FITRS).

Chart 26

APA2 Negative corrections – Volumes



Note: Volumes relative to APA2 negative corrections (in trillions EUR). Negative corrections refer to inflated volumes.
Sources: Financial Instruments Transparency System (FITRS).

In addition, ESMA will continue extending this approach to the SFTR reporting regime with the expectation of completing the implementation of a full suite of SFTR DQIs in 2023.

ESMA will also continue with its established approach of monitoring the integrity of TR reports, which is a crucial aspect from the point of view of usability of EMIR and SFTR data.

As regards MiFIR data, ESMA will continue enhancing the approach to monitoring data quality issues of DRSP transaction and transparency data. As evidenced by the preceding section there is room for improvement in terms of setting up a more targeted approach with an efficient engagement with the NCAs on MiFIR data quality issues. ESMA will therefore seek to further replicate the EMIR engagement framework to MiFIR data as well.

4.3 Conclusions and next steps

The new approach to monitoring and following up on data quality issues implemented under EMIR has clearly proven its usefulness and ESMA will continue with its expansion during 2023, ESMA expects to further increase its engagement with the NCAs on the issues identified through the DQI dashboard also considering the preparation for EMIR Refit go-live.

5 Annex

5.1 List of publications utilizing transaction-level data under EMIR, SFTR and MiFIR

ESMA	<p>Trends, Risks and Vulnerabilities report</p> <p>ESMA50-165-2438 trv 1-23 risk monitor.pdf (europa.eu)</p> <p>Leverage and derivatives the case of Archegos</p> <p>esma50-165-2096_leverage_and_derivatives_the_case_of_archegos.pdf (europa.eu)</p> <p>Annual statistical report – EU derivatives markets</p> <p>esma50-165-2001 emir_asr_derivatives_2021.pdf (europa.eu)</p> <p>Final report on emission allowances and associated derivatives</p> <p>esma70-445-38 final_report_on_emission_allowances_and_associated_derivatives.pdf (europa.eu)</p> <p>Final report on the clearing and derivative trading obligations in view of the 2022 status of the benchmark transition</p> <p>ESMA70-446-772 Final Report on CO-DTO in the context of the benchmark transition.pdf (europa.eu)</p>
ECB/E SRB	<p>ECB Financial Stability Review (FSR) boxes, Special Features, and working papers:</p> <ul style="list-style-type: none"> • Economic Bulletin article September 2019: Derivatives transactions data and their use in central bank analysis • FSR May 2020 Special Feature: Derivatives-related liquidity risk facing investment funds • FSR Nov 2020 Box: Interconnectedness of derivatives markets and money market funds through insurance corporations and pension funds

	<ul style="list-style-type: none"> • FSR Nov 2021 Box 9: Lessons learned from initial margin calls during the March 2020 market turmoil • FSR May 2022 Box 3: Interest rate risk exposures and hedging of euro area banks' banking books • FSR Nov 2022 Special Feature A: Financial stability risks from energy derivatives markets • FSR Nov 2022 Box 3: Euro area interest rate swaps market and risk-sharing across sectors • ECB Working Paper Series 2022: The impact of derivatives collateralisation on liquidity risk: evidence from the investment fund sector • Journal of Financial Market Infrastructures: A descriptive analysis of the client clearing network in the European derivatives landscape • FSR Nov 2017 Box: Can commodity trading firms create systemic risk via derivatives markets? • Macroprudential Bulletin Oct 2019: Investigating initial margin procyclicality and corrective tools using EMIR data • ECB Working Paper Feb 2019: Interdependencies in the euro area derivatives clearing network: a multi-layer network approach • ECB Working Paper Feb 2019: The anatomy of the euro area interest rate swap market • ECB Working Paper Sep 2022: Uncovering the network structure of non-centrally cleared derivative markets: evidences from regulatory data • ECB Working Paper Sep 2022: Evaluating market risk from leveraged derivative exposures • Economic Bulletin Mar 2022 Box: The role of speculation during the recent increase in EU emissions allowance prices <p>ESRB:</p> <p>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</p> <p>Several reports using EMIR data have been published, including:</p> <ul style="list-style-type: none"> • https://www.esrb.europa.eu/pub/pdf/reports/nbfi_monitor/esrb.NBFI_Monitor.2020715~a623f2329b.en.pdf • https://www.esrb.europa.eu/pub/pdf/reports/esrb.report200608_on_Liquidity_risks_arising_from_margin_calls_3~08542993cf.en.pdf
Bafin	<p style="text-align: center;">BaFin's Annual Reports</p> <p>https://www.bafin.de/EN/PublikationenDaten/Jahresbericht/jahresbericht_node_en.html</p> <p><i>PFOF study (in German)</i></p>
AFM	<p><i>Trend Monitor 2023:</i></p> <p>https://www.afm.nl/en/over-de-afm/verslaglegging/trendzicht</p>

	<p><i>Assessing the quality of executions on trading venues:</i></p> <p>https://www.afm.nl/~ /profmedia/files/nieuws/2022/afm-paper-assessment-execution-quality-pfof-venues.pdf</p> <p><i>State of the capital market 2022:</i></p> <p>https://www.afm.nl/~ /profmedia/files/publicaties/2022/state-of-the-capital-markets-visuals.pdf</p> <p><i>AFM Market Watch newsletters (e.g. benchmarks, shortselling, GameStop):</i></p> <p>https://www.afm.nl/en/sector/themas/beurzen-en-effecten/afm-market-watch</p>
<p>AMF</p>	<p>Retail activity since Covid</p> <p>https://www.amf-france.org/en/news-publications/publications/household-savings-observatory/active-retail-investors-dashboard/active-retail-investor-dashboard-no8-october-2022 (published every quarter)</p> <p>https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/analysis-execution-retail-investor-orders-first-months-covid-19-crisis-0</p> <p>https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/retail-investor-behaviour-during-covid-19-crisis</p> <p>https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/retail-investors-and-their-activity-covid-crisis-younger-more-numerous-and-attracted-new-market</p> <p>Commodity derivatives</p>

<p>https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/analysis-mifid-ii-position-data-commodity-derivatives-who-are-market-participants-and-what-their</p> <p>Financial markets</p> <p>https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/quantifying-systematic-internalisers-activity-their-share-equity-market-structure-and-role-price</p> <p>https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/2022-markets-and-risk-outlook</p> <p>https://www.afm.nl/en/sector/actueel/2022/februari/onderzoek-verbod-short-sell</p> <p>Initial analysis of SFTR Reporting Data</p> <p>https://www.amf-france.org/en/initial-analysis-sftr-reporting-data</p> <p>Characteristics of the French Equity Options Market</p> <p>https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/characteristics-french-equity-options-market</p> <p>Overview of the Bond Market Transparency under Mifid 2</p> <p>https://www.amf-france.org/en/news-publications/publications/reports-research-and-analysis/overview-bond-market-transparency-under-mifid-2</p>

5.2 List of abbreviations

APA	Authorized Publication Arrangement
ARM	Approved Reporting Mechanisms
Bafin	Bundesanstalt für Finanzdienstleistungsaufsicht (German Federal Financial Supervisory Authority)
bps	Basis points
CCP	Central counterparty
CDS	Credit Default Swaps
CTP	Consolidated Tape Providers
DQI	Data Quality Indicator
DRSP	Data Reporting Service Provider
DTO	Derivatives Trading Obligation
EMIR	European Market Infrastructure Regulation
ESMA	European Securities and Markets Authority
DQR	Data Quality Regulation
ESRB	European Securities and Markets Authority Regulation Board
EU	European Union
EUA	European Union Agency
EUR	Euro
ECB	European Central Bank
ETS	European Trading System
FITRS	Financial Instruments Transparency Regulation System
FIRDS	Financial Instruments Reference Data System
ICE	Intercontinental Exchange
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
NOFSA	National competent authority for Securities Activities
NCA	National Competent Authority
REFIT	Regulatory Fitness and Performance Programme
RHS	Right-Hand Side
RSE	Report Submitting Entity
SI	Systematic Internaliser
SFT	Securities Financing Transaction
SFTR	Securities Financing Transactions Regulation
TRV	Trends, Risks, and Vulnerabilities
TSR	Trade State Report
TAR	Trade Activity Report
UK	United Kingdom

US United States

Currencies and countries abbreviated in accordance with ISO standards