European Securities and Markets Authority

Consultation Paper

MiFID II/ MiFIR review report on the transparency regime for non-equity instruments and the trading obligation for derivatives

10 March 2020 | ESMA70-156-2189

Responding to this paper

ESMA invites comments on all matters in this paper and in particular on the specific questions summarised in Annex 1. Comments are most helpful if they:

1. respond to the question stated;
2. indicate the specific question to which the comment relates;
3. contain a clear rationale; and
4. describe any alternatives ESMA should consider.

ESMA will consider all comments received by **19 April 2020.**

All contributions should be submitted online at www.esma.europa.eu under the heading 'Your input - Consultations'.

Publication of responses

All contributions received will be published following the close of the consultation, unless you request otherwise. Please clearly and prominently indicate in your submission any part you do not wish to be publicly disclosed. A standard confidentiality statement in an email message will not be treated as a request for non-disclosure. A confidential response may be requested from us in accordance with ESMA's rules on access to documents. We may consult you if we receive such a request. Any decision we make not to disclose the response is reviewable by ESMA's Board of Appeal and the European Ombudsman.

Data protection

Information on data protection can be found at www.esma.europa.eu under the heading 'Data protection'.

Who should read this paper?

This document will be of interest to all stakeholders involved in the securities markets. It is primarily of interest to competent authorities and firms that are subject to MiFID II and MiFIR – in particular, investment firms and credit institutions performing investment services and activities and trading venues. This paper is also important for trade associations and industry bodies, institutional and retail investors and their advisers, and consumer groups, as well as any market participant because the MiFID II and MiFIR requirements seek to implement enhanced provisions to ensure the transparency and orderly running of financial markets with potential impacts for anyone engaged in the dealing with or processing of financial instruments.

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Acronyms used

ADNA	Average daily notional amount
ADNT	Average daily number of transactions
CA	Competent Authority
CP	Consultation Paper
ESMA	European Securities and Markets Authority
ILQ	Illiquid
LIS	Large in scale
MiFID I	Directive 2004/39 of the European Parliament and of the Council of 21 April 2004 on markets in financial instruments amending Council Directive 85/611/EC and 93/6/EEC and Directive 2000/12/EC of the European Parliament and of the Council and repealing Council Directive 93/22/EEC
MIFID II	Directive 2014/65/EU of the European Parliament and the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU
MiFIR	Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012
MTF	Multilateral trading facility
NCA	National competent authority
OJ	Official Journal
OTF	Organised Trading Facility
RM	Regulated market
SI	Systematic internaliser

1 Executive Summary

Reasons for publication

This consultation paper covers three mandates of ESMA. More specifically, ESMA is mandated by Article 52(1) to (3) of MiFIR to submit a report to the European Parliament and to the Council on the impact in practice of the transparency obligations established pursuant to Articles 3 to 13. The articles related to equity and equity-like instruments have been tackled in the consultation paper to the MiFID II/ MiFIR review report on the transparency regime for equity and equity-like instruments (ESMA70-156-2188), and this consultation paper will cover Articles 8 to 11 MiFIR.

Furthermore, Article 52(6) of MiFIR requires ESMA to submit a report to the European Parliament and to the Council on the progress made in moving trading in standardised OTC derivatives to exchanges or electronic trading platforms pursuant to Articles 25 and 28 of MiFIR. This mandate is also covered in the below report.

Under Article 17 of RTS 2 ESMA is required to analyse whether it is appropriate to move to the following stage in terms of transparency with regard to (i) the average daily number of trades (ADNT) threshold used for the quarterly liquidity assessment of bonds, and (ii) the trade percentile used for determining the pre-trade SSTI thresholds. If that move is deemed appropriate, ESMA shall submit to the Commission an amended version of the regulatory technical standard adjusting the thresholds for the relevant parameters. This review has also been integrated into this report.

ESMA is also taking this opportunity to review the transparency regime specifically for commodity derivatives embedded in RTS 2.

In this publication, ESMA has undertaken a technical review of the MiFIR transparency regime for non-equity instruments with the aim of both (i) ensuring that the provisions have delivered on their objectives and (ii) where possible, proposing legislative amendments to ensure more effective application of the rules while simplifying a regime that has proved to be rather complex to apply and supervise in practice. However, the ESMA review does not intend to redefine the general objectives and goals that have been set by co-legislators when deciding on the MiFID II/MiFIR regime.

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For practical reasons, ESMA has decided to publish two consultation papers. The report below focuses on the transparency regime applicable to non-equity instruments. Another report analysing the transparency regime applicable to equity and equity-like instruments was published on 4 February 2020 (ESMA70-156-2188).

This consultation paper (transparency regime for non-equity instruments) contains proposals aiming at simplifying the structure of the transparency regime while trying to improve the overall transparency available to market participants. It is structured as follows: after a brief introduction in Section 2, Section 3 tackles the review of Level 1 provisions and starts with the analysis of the pre-trade transparency regime for non-equity instruments (Section 3.1). In particular, three dimensions are investigated (i) the evolution of pre-trade transparency before and after MiFID II/ MiFIR (ii) the evolution of trading executed on- and off-venue (including on systematic internalisers), (iii) the evolution in the use of the different types of waivers. In particular, two main conclusions can be drawn from the analysis. First, the level of pre-trade transparency in non-equity markets remains limited. Secondly, the market structures prevalent in many non-equity markets and the complex structure of the non-equity waivers and the multiple choices available to waive pre-trade transparency requirements turn real-time transparency into the choice of last resort.

Section 3.2 deals with the post-trade transparency regime. This section concludes that also the level of post-trade real-time transparency remains very limited after the implementation of MiFID II/ MiFIR which is exacerbated by the complex deferral regime which is subject to national discretion leading to different rules applying in the Union. In this regard the ESMA proposals aim at simplifying the regime in order to increase post-trade transparency. Section 3.3 concludes with the trading obligation for derivatives.

The second part of the paper focuses on the Level 2 review (Section 4). In particular, Section 4.1 deals with the review of the setting of (i) one of the parameter to assess bond liquidity and (ii) of the percentile used to calculate the pre-trade SSTI thresholds for bonds and other non-equity instruments. The paper concludes with the review of the liquidity assessment and the methodology to determine the pre-trade LIS threshold for commodity derivatives.

Next Steps

ESMA will consider the feedback it receives to this consultation in Q2 2020 and expects to publish a final report and submit, if necessary, draft technical standards to the European Commission for endorsement in July 2020.

Disclaimer

Data analyses based on data from the Financial Instruments Transparency System (FITRS) are based on data provided by trading venues, approved publication arrangements (APAs) and National Competent Authorities.

Therefore, ESMA has to rely on those reporting entities in respect of the completeness and accuracy of the submitted data. Delayed or incorrect provision of the relevant data may affect the completeness and accuracy of the information.

2 Introduction

1. This Consultation Paper (CP) covers the reports to be delivered to the Commission under the following articles:

Article 52(1) of MiFIR:

By 3 March 2020, the Commission shall, after consulting ESMA, submit a report to the European Parliament and to the Council on the impact in practice of the transparency obligations established pursuant to Articles 3 to 13, in particular on the impact of the volume cap mechanism described in Article 5, including on the cost of trading for eligible counterparties and professional clients and on trading of shares of small and mid-cap companies, and its effectiveness in ensuring that the use of the relevant waivers does not harm price formation and how any appropriate mechanism for imposing sanctions for infringements of the volume cap might operate, and on the application and continued appropriateness of the waivers to pre-trade transparency obligations established pursuant to Article 4(2) and (3) and Article 9(2) to (5).

Article 52(6) of MiFIR:

By 3 March 2020, the Commission shall, after consulting ESMA, submit a report to the European Parliament and to the Council on the progress made in moving trading in standardised OTC derivatives to exchanges or electronic trading platforms pursuant to Articles 25 and 28.

Article 17(4) to (9) of CDR (EU) 2017/583:

4. ESMA shall, by 30 July of the year following the date of application of Regulation (EU) No 600/2014 and by 30 July of each year thereafter, submit to the Commission an assessment of the operation of the thresholds for the liquidity criterion 'average daily number of trades' for bonds as well as the trade percentiles that determine the size specific to the financial instruments covered by paragraph 8. The obligation to submit the assessment of the operation of the thresholds for the liquidity criterion for bonds ceases once S4 in the sequence of paragraph 6 is reached. The obligation to submit the assessment of the trade percentiles ceases once S4 in the sequence of paragraph 8 is reached.

5. The assessment referred to in paragraph 4 shall take into account:

(a) the evolution of trading volumes in non-equity instruments covered by the pre-trade transparency obligations pursuant to Article 8 and 9 of Regulation (EU) No 600/2014;

(b) the impact on liquidity providers of the percentile thresholds used to determine the size specific to the financial instrument; and

(c) any other relevant factors.

> 6. ESMA shall, in light of the assessment undertaken in accordance with paragraphs 4 and 5, submit to the Commission an amended version of the regulatory technical standard adjusting the threshold for the liquidity criterion 'average daily number of trades' for bonds according to the following sequence:
>
> (a) S2 (10 daily trades) by 30 July of the year following the date of application of Regulation (EU) No 600/2014;
>
> (b) S3 (7 daily trades) by 30 July of the year thereafter; and
>
> (c) S4 (2 daily trades) by 30 July of the year thereafter
>
> 7. Where ESMA does not submit an amended regulatory technical standard adjusting the threshold to the next stage according to the sequence referred to in paragraph 6, the ESMA assessment undertaken in accordance with paragraphs 4 and 5 shall explain why adjusting the threshold to the relevant next stage is not warranted. In this instance, the move to the next stage will be postponed by one year.
>
> 8. ESMA shall, in light of the assessment undertaken in accordance with paragraphs 4 and 5, submit to the Commission an amended version of the regulatory technical standard adjusting the threshold for trade percentiles according to the following sequence:
>
> (a) S2 (40th percentile) by 30 July of the year following the date of application of Regulation (EU) No 600/2014;
>
> (b) S3 (50th percentile) by 30 July of the year thereafter; and
>
> (c) S4 (60th percentile) by 30 July of the year thereafter.
>
> 9. Where ESMA does not submit an amended regulatory technical standard adjusting the threshold to the next stage according to the sequence referred to in paragraph 8, the ESMA assessment undertaken in accordance with paragraphs 4 and 5 shall explain why adjusting the threshold to the relevant next stage is not warranted. In this instance, the move to the next stage will be postponed by one year.

2. Given the overarching scope of the report under Article 52(1) of MiFIR, ESMA has decided to tackle this issue in two separate reports, one focusing on equity and equity-like instruments, already published on 4 February, and this CP focusing on non-equity instruments.

3. ESMA has decided to tackle other related mandates in this report because of the close links in terms of analysis to be performed for them. In particular, Article 52(1) of MiFIR requires ESMA to analyse the impact in practice of the transparency obligations established pursuant to Articles 8 to 11, i.e. for non-equity instruments. Furthermore, a

more specific analysis is required for the reports under Articles 52(6) of MiFIR and Article 17 of Commission Delegated Regulation (EU) 2017/583 (RTS 2)[1].

4. The former requires to analyse the progress made in moving trading in standardised OTC derivatives to exchanges or electronic trading and the latter requires to assess the appropriateness of certain thresholds for transparency purposes for non-equity instruments. Moreover, considering the feedback received by market participants regarding the thresholds applicable for commodity derivatives ESMA is taking this opportunity to review the transparency regime for commodity derivatives.

5. The first part of the CP focuses on the Level 1 review required under Article 52(1) and (6) of MiFIR. In particular, Section 3.1 will focus on the pre-trade transparency requirements including an assessment of the current level of pre-trade transparency available and how trading has evolved throughout the first period of application of MiFID II/ MiFIR. Section 3.2 focuses on post trade requirements for non-equity instruments. Lastly, Section 3.3 analyses the trading obligation for derivatives.

6. The mandate under Article 52(1) also includes a review of Article 12 and 13 on the obligation to make pre- and post- trade data available separately and on a reasonable commercial basis, respectively. ESMA notes that these topics were covered under ESMA's consultation paper on the development in prices for pre- and post-trade data and on the post-trade consolidated tape (CT) published on 12 July 2019[2] and in the related final report published on 5 December 2019[3].

7. The second part of the CP firstly, focuses on the Level 2 review required under Article 17(4) to (9) of CDR (EU) 2017/583 (Section 4.1) and secondly, tackles the RTS 2 review for commodity derivatives (Section 4.2).

8. A number of difficulties were encountered when drafting this report, including (i) the access to MiFID I data since a regulatory transparency framework was not in place yet for non-equity instruments. Indeed, the data received for pre-MiFID II/MiFIR through a data collection was limited; (ii) the difficulty to disentangle and forecast the effect of Brexit over the different provisions (iii) the difficulty faced to compare the data received through the data collection and provided by the Financial Instruments Transparency System (FITRS) which is reported by trading venues, approved publication arrangements (APAs) and National Competent Authorities (NCAs).

9. On 16 January 2019, ESMA proposed to the Commission to postpone the delivery of the reports foreseen under Article 19, 26 and 52 of MiFIR and 90 of MiFID II. It was, in

[1] Commission Delegated Regulation (EU) 2017/583 of 14 July 2016 supplementing Regulation (EU) No 600/2014 of the European Parliament and of the Council on markets in financial instruments with regard to technical standards on transparency requirements for trading venues and investment firms in respect of bonds, structured finance products, emission allowances and derivatives, 31.3.2017, L 87, p. 229.

[2] https://www.esma.europa.eu/sites/default/files/library/esma70-156-1065_cp_mifid_review_report_cost_of_market_data_and_consolidated_tape_equity.pdf

[3] https://www.esma.europa.eu/sites/default/files/library/mifid_ii_mifir_review_report_no_1_on_prices_for_market_data_and_the_equity_ct.pdf

particular, proposed to postpone the reports foreseen under 52(1) to (3) of MiFIR by 4 months (to July 2020) so as to allow ESMA to base its analysis on a sufficient amount of feedback on the application of the MiFIR transparency regime and, hence, achieve more efficient results. This has also allowed ESMA to collect data for a longer period of time leading to more accurate analyses and recommendations.

10. Last but not least, the postponement of the reports was also made with the hope to better be able to take into account the decision by the UK to leave the Union. However, remaining uncertainty about the timing and conditions of Brexit has not allowed ESMA to have full clarity on the changes in market structures due to Brexit and the potential impact of the relocations of investment firms and trading venues to the EU27. ESMA is and will continue to follow developments around Brexit closely.

3 Level 1 review

3.1 Pre-trade transparency regime for trading venues in respect of non-equity

11. In response to the financial crisis and the weaknesses identified in the way information on trading opportunities in financial instruments other than shares was available to market participants, MiFIR and MiFID II aimed to enhance the efficiency, resilience and integrity of financial markets, notably through the introduction of a pre-trade and a post-trade trade transparency regime for non-equity instruments. Furthermore, in order to make Union financial markets more transparent and efficient and to help the implementation of the Derivative Trading Obligation (DTO), MiFiD II /MiFIR also introduced a new broadly defined trading venue category of OTFs, that complements regulated markets and Multilateral Trading Facilities (MTFs) for non-equity trading with the purpose of having more non-equity trading taking place on trading venues and therefore being subject to pre-trade transparency[4].

3.1.1 Legal framework

12. The pre-trade transparency regime introduced for non-equity instruments shares some similarities with the pre-trade transparency regime for equities. However, it also includes some specific features to accommodate some distinct characteristics of non-equity trading compared to equity trading, in particular different trading protocols and the heterogeneous asset classes covered.

13. Article 8 of MiFIR requires market operators and investment firms operating a trading venue to make public current bid and offer prices and the depth of trading interests at

[4] As per Article 90(1)(a) of MiFID II, the Commission shall, after consulting ESMA, present a report to the European Parliament and the Council on the functioning of OTFs, including their specific use of matched principal trading, taking into account supervisory experience acquired by competent authorities, the number of OTFs authorised in the Union and their market share and in particular examining whether any adjustments are needed to the definition of an OTF and whether the range of financial instruments covered by the OTF category remains appropriate. ESMA is expected to publish a CP on this matter in 2020.

those prices advertised on their systems for bonds, structured finance products (SFPs), emission allowances and derivatives (non-equity instruments). This information must be made available to the public on a continuous basis during normal trading hours and is calibrated for different types of trading systems, as further specified in Annex I of RTS 2. Moreover, the MiFID Quick Fix also extended the transparency regime for non-equity instruments to package orders in June 2016.

14. Compared to the pre-trade transparency requirements for equity instruments, Article 8 of MiFIR includes some specific provisions. Firstly, and most notably, it introduces an exemption from pre-trade transparency obligations for “derivative transactions of non-financial counterparties which are objectively measurable as reducing risks directly relating to the commercial activity of the non-financial counterparty or of that group”. Introduced during the Trilogue of the Level 1 negotiations, and noting that, in contrast with the transparency regime for equity instruments, the non-equity transparency regime does not provide for a dedicated negotiated transaction waiver.

15. Secondly, in addition to order-book, quote-driven, hybrid and period auction trading systems, the MiFIR non-equity transparency regime introduces two new types of trading systems, voice trading systems and request-for-quote (RFQ) systems, to be taken into account for the calibration of pre-trade transparency requirements. This reflects the significance of alternative trading patterns in non-equity instruments, including bonds, and the aim of MiFIR in ensuring that particularities of non-equity trading are reflected in the transparency regime thereby contributing to the MiFID II/MiFIR objective of having more trading taking place on multilateral venues in a transparent way.

16. Similar to equity instruments, Article 9 of MiFIR recognises the need for waivers from pre-trade transparency obligations for non-equity instruments. However, in order not to undermine the sound transparency framework and the efficiency of price formation, and as clarified by Recital (14) of MiFIR, exemptions from pre-trade transparency should be available only in certain limited and clearly defined cases.

17. Article 9 of MiFIR provides for five different types of waivers. As for equity instruments, pre-trade transparency requirements may be waived for orders that are large in scale (LIS) compared with normal market size and orders held in an order management facility (OMF) of the trading venue pending disclosure (Article 9(1)(a) of MiFIR).

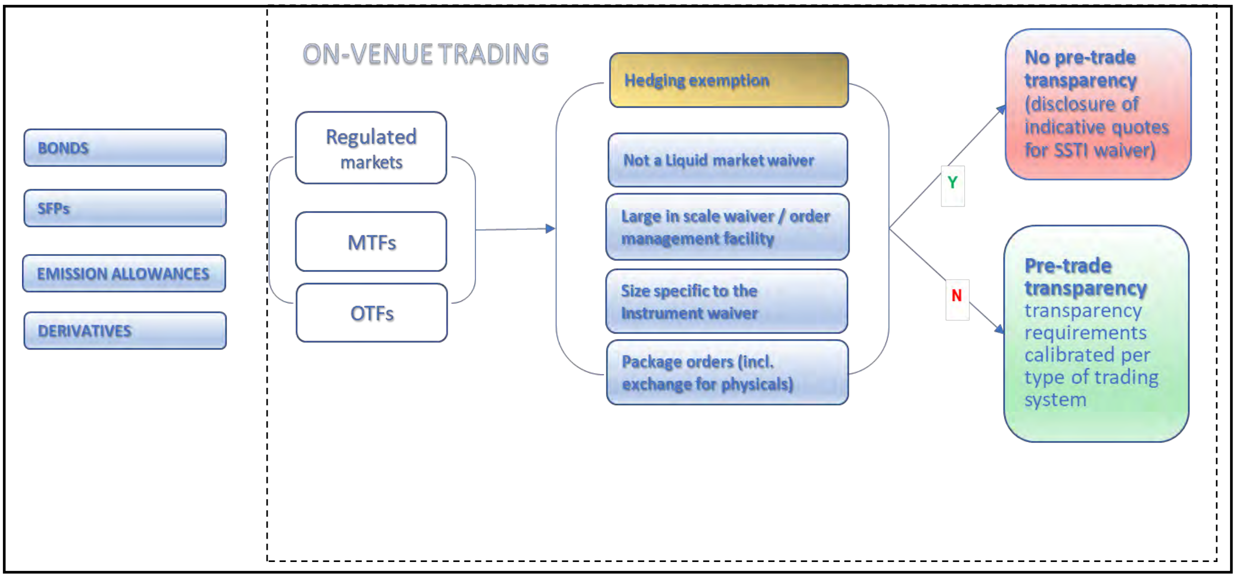
18. MiFIR introduces a pre-trade transparency waiver for actionable indications of interest (AIOIs) in RFQ and voice trading systems above a size specific to the instrument (SSTI) which would expose liquidity providers to undue risks and takes into account whether the relevant market participants are retail or wholesale investors (Article 9(1)(b) of MiFIR). In ESMA’s understanding this waiver aimed at accommodating and incentivising the move from OTC trading to on-venue trading. The SSTI waiver is only a partial waiver as Article 8 of MiFIR requires a trading venue benefitting from such a waiver to still make available some minimum level of pre-trade transparency information. In such circumstances, the trading venue is required to make public at least indicative pre-trade bid and offer prices which are close to the price of the trading interests advertised through its systems and as further defined in Article 5(2) of RTS 2.

19. Pre-trade transparency obligations may also be waived for derivatives which are not subject to the trading obligation for derivatives (DTO) and other financial instruments for which there is not a liquid market (Article 9(1)(c) of MiFIR). The more limited number of pre-trade transparency waivers for derivatives subject to the trading obligation is consistent with the very purpose of the DTO of allowing for efficient competition between eligible trading venues, including through displayed pre-trade information.

20. To address some specific trading patterns not initially included in MiFIR, the MiFID Quick Fix in June 2016 extended the non-equity transparency regime by providing for waivers for (i) orders for the purpose of executing an exchange for physical or EFP (Article 9(1)(d) of MiFIR) and for (ii) package orders where at least one component is above LIS or does not have a liquid market, provided that the package order does not have a liquid market as a whole or where all components are executed on a RFQ or voice trading system and are above SSTI (Article 9(1)(e) of MiFIR).

21. Figure 1 below provides for an overview of the pre-trade transparency requirements for trading venues.

Figure 1 The pre-trade transparency regime for trading venues



22. The procedure to be followed by an NCA before granting a waiver is similar to the one established for equity instruments.

23. CAs may also decide to temporarily suspend pre- and post-trade transparency requirements on a trading venue they supervise for a class of bond, SFPs, emission allowances or derivatives (Articles 9(4) and 11(4) of MiFIR, see paragraph 224 for more details).

24. The MiFIR transparency regime for non-equity instruments has been further calibrated through Level 2 measures. In particular, RTS 2 calibrates the pre-trade transparency

requirements applicable to the different types of trading systems and determines which orders or quotes may be eligible for one of the waivers described above.

25. Notably, RTS 2 specifies how to determine whether a financial instrument has a liquid market. Three main approaches, depending on the type of instrument, are set out: (i) the liquidity status for bonds is determined quarterly on an instrument-by-instrument basis, (ii) for most other instruments the liquidity status is determined on an annual basis and in the large majority on a class of instruments basis; and (iii) lastly, the static determination of the liquidity status in the RTS itself is provided for the remaining asset classes (i.e. all foreign exchange derivatives are deemed illiquid for the time being; all equity instruments, excluding swaps and portfolio swaps, are considered liquid and securitised derivatives are all deemed liquid).

26. RTS 2 also sets out the methodology for determining the thresholds for the SSTI- and LIS-waivers (pre-trade transparency) and deferrals (post-trade transparency) on an annual basis. As a general rule, the pre-trade SSTI and LIS-thresholds are respectively lower or equal to the post-trade SSTI and LIS-thresholds. Moreover, the SSTI thresholds are lower than or equal to the LIS thresholds for waivers and deferrals respectively. RTS 2 sets out different approaches for determining the SSTI- and LIS-thresholds: (i) a percentile approach for bonds as well as for most liquid derivatives classes; (ii) an approach based on the average daily notional amount traded for most liquid equity derivatives; and (iii) fixed thresholds for illiquid classes of instruments.

27. The EC introduced a phase-in for the liquidity assessment of bonds and the pre-trade SSTI-thresholds that are determined based on the percentile approach. The phase-in consists of 4 stages gradually lowering the criteria for determining a bond as liquid and increasing the pre-trade SSTI-thresholds[5]

3.1.2 ESMA's assessment of the pre-trade transparency framework

28. MiFID II extended the pre-trade transparency framework to non-equity instruments as a reaction to the financial crisis which exposed deficiencies in the way information on trading opportunities and prices was available to market participants. The pre-trade transparency requirements in conjunction with the post-trade transparency requirements aim at increasing the transparency of non-equity markets, thereby contributing to a more efficient price formation process and supporting the timely valuation of products.

29. This section presents ESMA's initial assessment of how the pre-trade transparency framework delivered on the objectives of MiFID II and includes some recommendations on how shortcomings identified could be addressed in the future. The assessment focuses on the Level 1 requirements. However, since the Level 2 provisions are key for applying the pre-trade transparency regime, the assessment covers at times also the Level 2 framework. The analysis starts with assessing the current level of pre-trade transparency, focussing on changes from MiFID I to MiFID II, the respective share of on-

[5] See Section 4.1 for more details on the phase-in regime.

venue and off-venue trading and the use of waivers from pre-trade transparency. The analysis then assesses the quality of available pre-trade data after presenting ESMA's assessment and proposals on the SSTI waiver, the hedging exemption and the development of new trading systems. A dedicated assessment of the phase-in regime of RTS 2 as well as of the segmentation of asset classes is presented in section 4.1.

30. The analysis is carried out on the basis of data available to ESMA either from the Financial Instruments Transparency System (FITRS), from trading venues following a request for information on (i) the volume and number of transactions which results from orders benefitting from a waiver from pre-trade transparency and (ii) the volume and number of transactions benefitting from a deferral for post-trade transparency, covering both the period before the application of MiFID II (the calendar year 2017) and after the application of MiFID II (the calendar year 2018) and from the recent ESMA report on waivers and deferrals.

31. The data does not include information on FX derivatives. While ESMA included FX derivatives in its data request, data quality issues did not allow the inclusion of FX derivatives (e.g. double reporting, simultaneous use of LIS and ILQ waiver for FX derivatives, data inconsistencies). Nevertheless, the data reported revealed that the trading volume in FX derivatives appears to be rather high, which puts into question the current status of FX derivatives as not having a liquid market. ESMA will closely monitor developments in the trading of FX derivatives and address the data quality issues identified. Should ESMA come during that process to the conclusion that the liquidity status of FX derivatives should be amended, ESMA would propose an amendment of RTS 2 in that respect. Furthermore, the FITRS data does not include SFPs due to data quality concerns, related in particular to the misclassification of bonds as SFPs.

3.1.2.1 Assessment of the current level of pre-trade transparency

A. Analysis

32. The current level of pre-trade transparency can be assessed along three dimensions. Firstly, by comparing pre-trade transparency post-MiFID II to the level of pre-trade transparency prior to MiFID II. Secondly, by comparing the notional trading volume and number of transactions traded on venue compared to the volume and number of transactions not executed on-venue. And thirdly, by assessing the types of waivers used across the different waiver types, overall and per asset class.

Pre-trade transparency under MiFID I vs. MiFID II

33. Concerning the first dimension, there has been no EU-wide transparency regime for non-equity instruments prior to MiFID II, thereby making it difficult to assess to what extent the level of pre-trade transparency has increased since the application of MiFID II. However, in some individual jurisdictions in the Union, there was already a pre-trade transparency regime for (at least some) non-equity instruments.

34. For instance, in Italy pre- and post-trade transparency requirements applied to financial instruments other than shares admitted to trading on regulated markets. The Consolidated law on Finance (Legislative Decree no. 58/1998) empowered Consob to extend, in whole or in part, the pre-trade transparency regime also to those financial instruments, if deemed necessary for the purposes of the orderly conduct of trading and the protection of investors. In the exercise of such power, under Consob Regulation on Markets (Regulation no. 16191/2007), Consob required trading venues – as well as systematic internalisers – to have in place appropriate pre-trade transparency requirements also for financial instruments other than shares admitted to trading on regulated markets, whose specific content and timing should be set by them taking into account the market structure, the specific features of the instrument and the size of the order or quote. Trading venues implemented those requirements by usually requiring that order book systems disclosed the five best bid and ask offers and the aggregate volume of orders at each price level. For quote driven systems the bid and ask quotes provided by market makers were generally subject to disclosure.

35. Similarly, in France, as a condition for authorisation of regulated markets and MTFs trading instruments other than shares, including non-equity instruments, the AMF General Regulation required those trading venues to provide appropriate information on buying and selling interests to ensure fair and orderly trading, while taking into account the characteristics of the financial instruments concerned and the arrangements for trading them. To ESMA's knowledge there has been no quantitative data analysis on the instruments subject to pre-trade transparency under these regimes.

36. In the UK, before MiFID II entered into force, the FCA handbook set expectations in the form of guidance on pre- and post-trade transparency requirements applicable to trading venues for instruments other than shares like bonds and derivatives. The guidance was intended to ensure fair and orderly trading under the trading venues' systems by taking into account the practices in the relevant markets and the trading systems used. Trading venues implemented those requirements by disclosing buy and sell trading interest resting on their order books and the aggregate volume of those orders. For quote driven systems market maker quotes were disclosed.

37. In Greece, the law transposing MiFID into national legislation, empowered the Hellenic Capital Market Commission (HCMC) to issue a resolution specifying the conditions for the authorisation of trading venues as well as their organisational requirements. In this context, trading venues were required to include in their rules the arrangements adopted for the pre-trade transparency in respect of transactions in financial instruments other than shares.

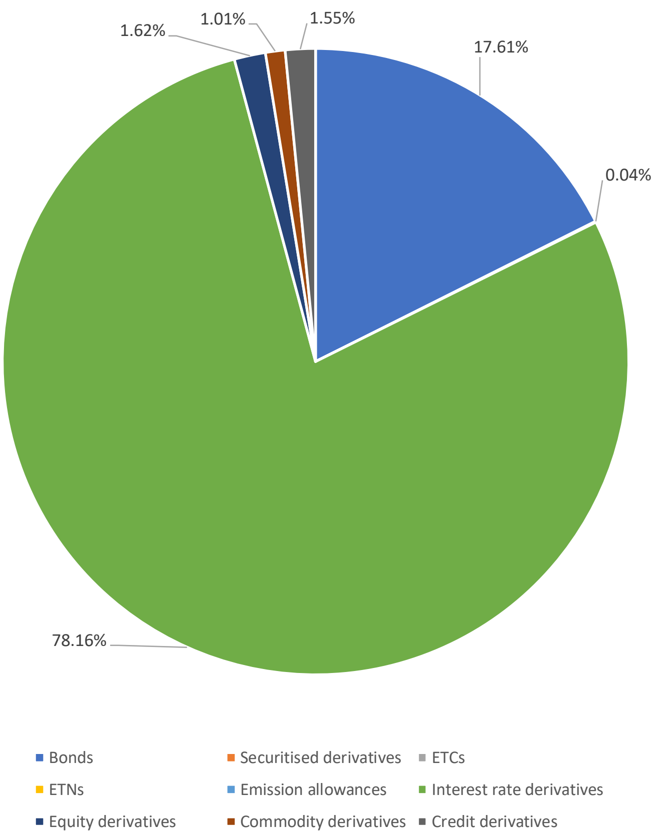
38. Furthermore, most trading venues (regulated markets and MTFs) in other jurisdictions trading non-equity instruments published some information about buying and selling interests in non-equity instruments traded on their platforms. As for equity markets, under certain circumstances, e.g. for orders/quotes of a large size (as defined by the trading venue) or for orders resting in an OMF pending disclosure, pre-trade transparency could be waived. Many trading venues allowed to formalise negotiated transactions above such block sizes.

39. It should be noted that overall the trading volume of non-equity instruments traded OTC, and hence not subject to pre-trade transparency, was very high under MiFID I.

On-venue trading compared to off-venue trading

40. Figure 2 below displays the total notional amount trading volume by asset class, including on-venue and OTC transactions as well as transactions based on orders/quotes benefitting from a waiver from pre-trade transparency. It can be seen that nearly 80%of the overall notional amount trading volume in 2018 covered interest rate derivatives (78.16%). 17.61% of transactions were concluded in bonds (sovereign and other types of bonds) and the remaining 4% of transactions in terms of notional amount traded were split between the asset classes of equity derivatives, commodity derivatives and credit derivatives (FX derivatives and SFPs are excluded as clarified above).

FIGURE 2 TOTAL NOTIONAL AMOUNT, PER ASSET CLASS, 2018

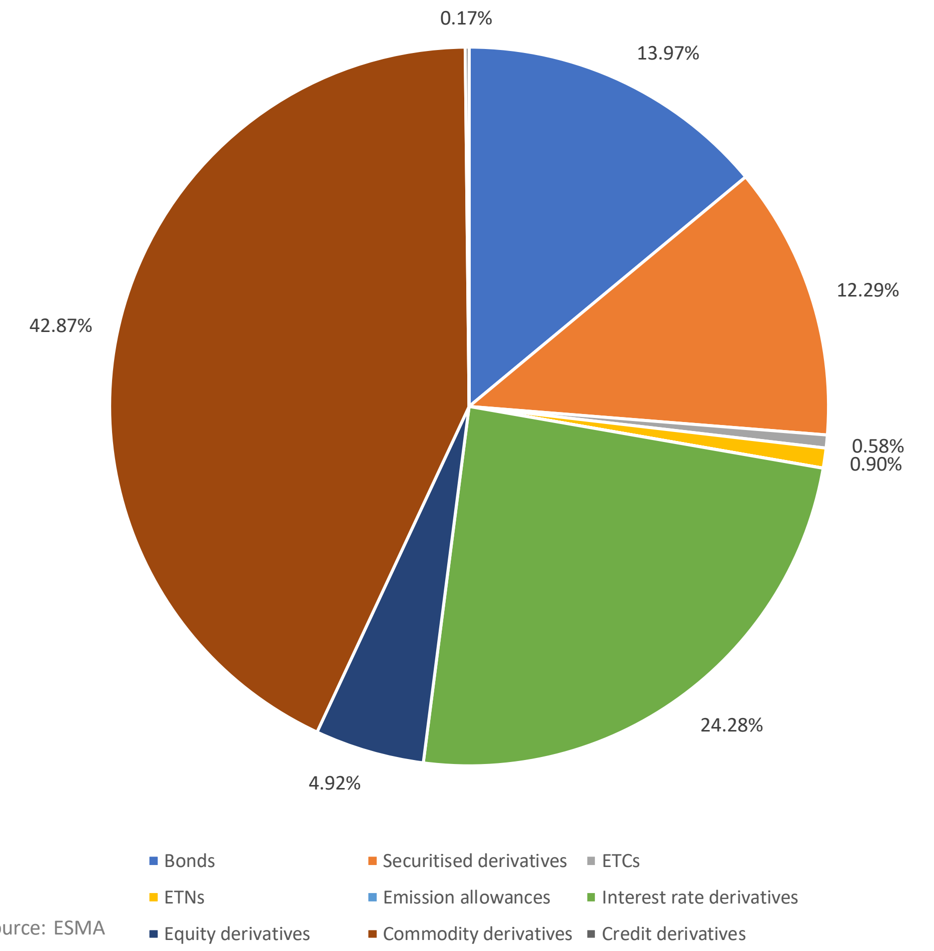


Source: ESMA

41. The split by asset class is more balanced when looking at overall trading in terms of number of transactions (see Figure 3). It can be observed that most transactions are concluded in commodity derivatives (42.87%), followed by interest rate derivatives (24.28%), bonds (13.97%), securitised derivatives (12.29%) and equity derivatives (4.29%). The difference between figures 2 and 3 can be explained by differences in the average size of transactions which is smaller for commodity derivatives (small notional

amount, many transactions of a small size) than for instance for interest rate derivatives (high notional amount, few transactions of a high size).

FIGURE 3 NUMBER OF TRANSACTIONS, PER ASSET CLASS, 2018



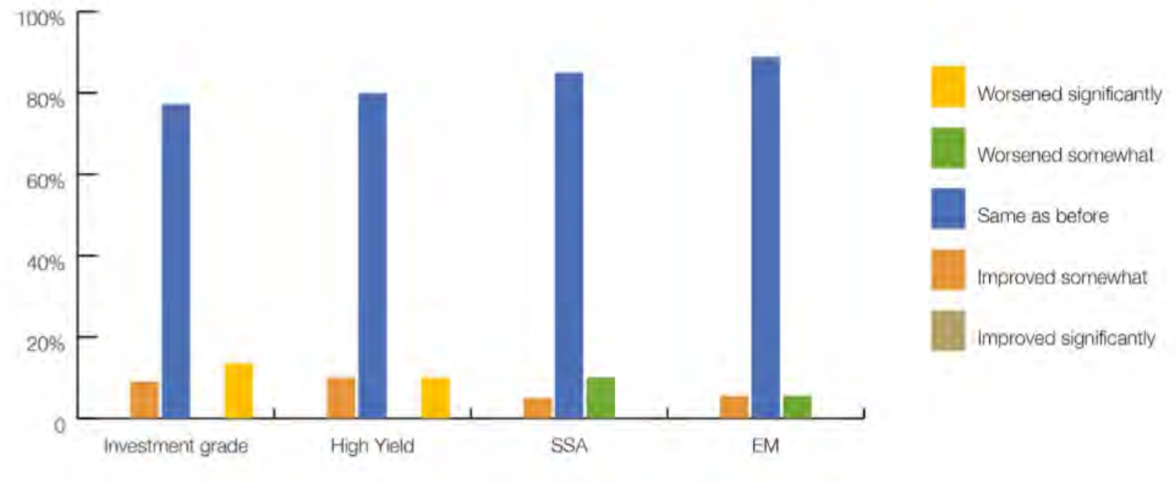
Source: ESMA

42. In anticipation of MiFID II many stakeholders expressed concerns that the pre- and post-trade transparency requirements for non-equity instruments would significantly impair available liquidity and may undermine the efficient functioning of markets. With MiFID II being applied for two years it can be concluded that these concerns have not materialised and that the impact on most market participants from pre-trade transparency was rather limited.

43. On the contrary, ESMA received concerns from market participants that the current pre-trade transparency regime is not providing sufficient transparency due to the high share of illiquid instruments and the high trading volume benefitting from waivers from pre-trade transparency. Some stakeholders raised concerns that the transparency in EU markets has worsened since the application of MiFID II, while the trading volumes have remained stable. Accordingly, these stakeholders recommend classifying more instruments, in particular bonds and interest rate derivatives, as liquid in order to become subject to pre-trade transparency.

44. Figure 4 below shows responses received to a survey carried out by ICMA covering 37 member firms for bonds[6]. The responses suggest that liquidity has remained largely unaffected across all bond classes in 2018.

FIGURE 4 BOND MARKET LIQUIDITY, 2018



Source: ICMA, MiFID II/R and the bond markets: the first year, December 2018

45. Figure 5 shows the split by execution venue (regulated market (RMKT), MTF (MLTF), OTF (OTFS), SI (SINT) and OTC (OTC)) based on transactions reported to FITRS in 2018 for the whole universe of non-equity instruments. It can be seen that about half of the trading volume in terms of notional amount (about 75% in terms of number of transactions) is concluded on regulated markets, roughly 20% (about 16% in terms of number of transactions) is concluded on MTFs or OTFs. At the same time, close to 30% of volume in terms of notional amount (9% in terms of number of transactions) are concluded OTC or on SIs.

46. From Figure 5 it can also be concluded that the trading sizes concluded OTC are significantly higher than on trading venue since the share of OTC-transactions in number of transactions is significantly lower than when looking at the notional amount traded. Moreover, it appears that the size of SI transactions is somewhat lower than OTC when looking at the number of transactions compared to the notional amount traded, indicating also here that the size of transactions concluded on SIs is relatively high. The high market share of regulated markets in terms of number of transactions across many asset classes confirms that in particular smaller trades are concluded on this execution venue.

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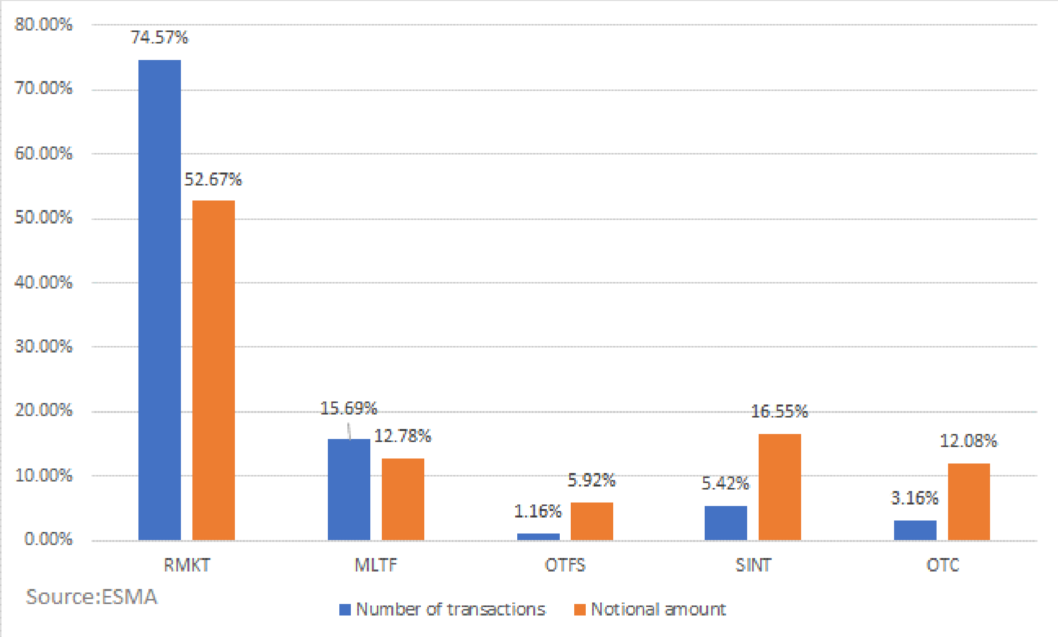
[6] ICMA, MiFID II/R and the bond markets: the first year, An analysis of the impacts and challenges of MiFID II/R implementation since January 2018, December 2018; accessible at: https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/Secondary-Markets/secondary-markets-regulation/mifid-ii-r/

FIGURE 5 NOTIONAL AMOUNT AND TRANSACTIONS IN NON-EQUITY INSTRUMENTS PER EXECUTION VENUE, 2018

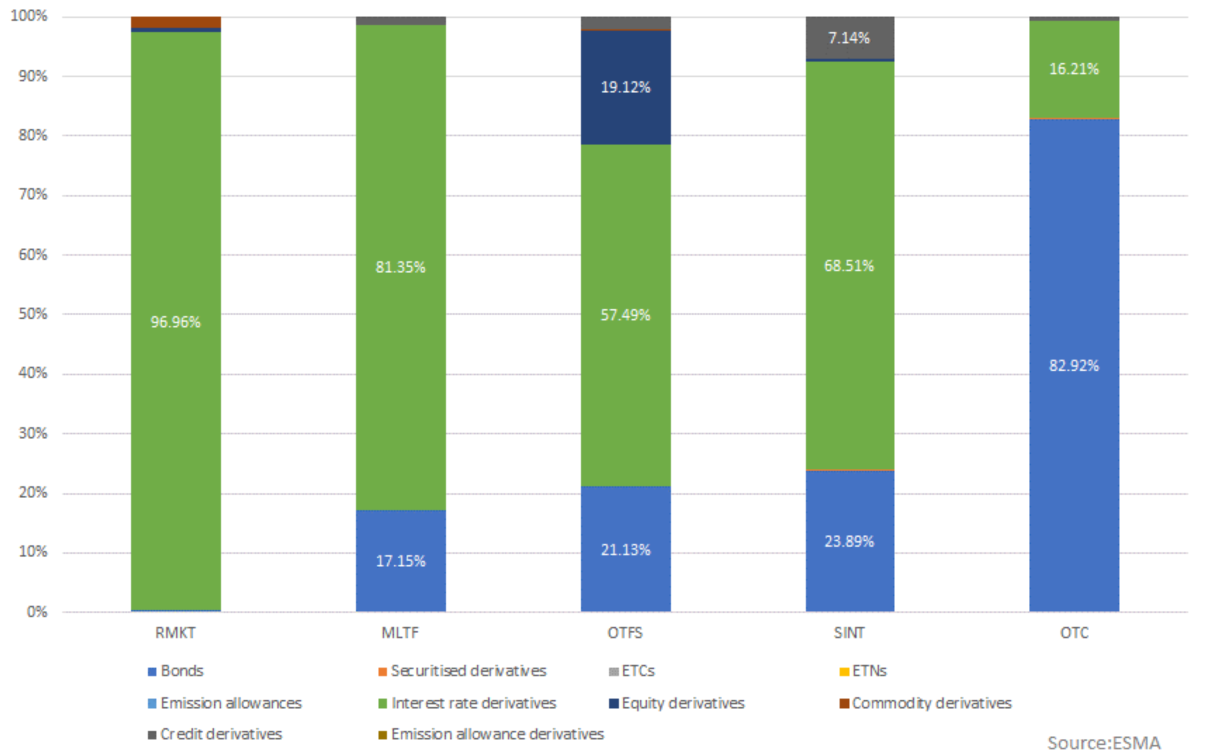


47. From Figure 6 to Figure 9 the trading activity (in notional amount traded and number of transactions) per execution venue and per asset class is presented. It can be noted that for different asset classes different execution venues are used. The overall high market share of regulated markets is mainly driven by trading activities in interest rate derivatives (see Figure 6 and Figure 7). Also, most of the trading volumes in MTFs is concluded in interest rate derivatives (see Figure 6 and Figure 7). Overall, significant trading activity in interest rate derivatives is executed on-venue (split mainly between regulated markets and OTFs) and most trading activity in commodity derivatives and emission allowances is concluded on regulated markets (see Figure 8 and Figure 9). The market share of OTFs is high for equity derivatives (see Figure 8). The relevance of on-venue trading activity for interest rate derivatives and commodity derivatives which are commonly traded off-venue, appears to indicate that the strict interpretation of the TOTV concept excludes an important part of instruments and related trading activity being subject to the transparency regime. However, in the case of interest rate derivatives, the importance of on-venue trading also reflects the important share of typical ETD contracts, such as interest rate futures and the application of the derivatives trading obligations for certain fixed-to-float single currency interest rate swaps, even if the interest rate derivatives subject to the trading obligation are offered by MTFs and OTFs. Last but not least, this counterintuitive result might also be due to data quality issues. In this regard, ESMA is committed to continue working with CAs and market participants to improve data quality which is key for the performance of the transparency calculations.

48. Furthermore, it can be observed that the market for bonds and securitised derivatives market is mainly an OTC-market (most transactions in terms of notional amount traded are concluded on SIs or OTC) as is the market for credit derivatives (mainly SI trading). Concerning the SI trading, it should be noted that SIs may benefit from a waiver from pre-

trade transparency for illiquid instruments and are not obliged to provide a quote where the quoted size is above SSTI.

FIGURE 6 NOTIONAL AMOUNT IN NON-EQUITY INSTRUMENTS PER EXECUTION VENUE, PER ASSET CLASS, 2018



Source:ESMA

Figure 7 Transactions in non-equity instruments per execution venue, per asset class, 2018

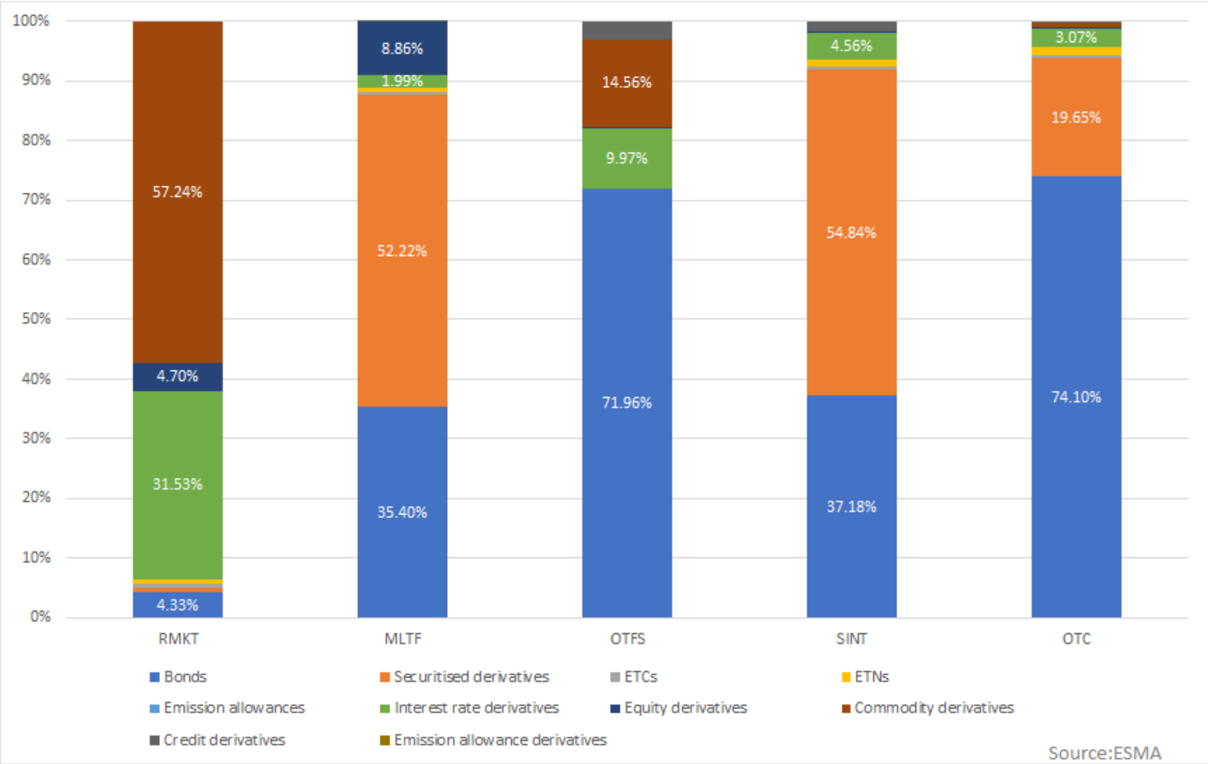


Figure 8 Notional Amount traded per execution venue and asset class, 2018

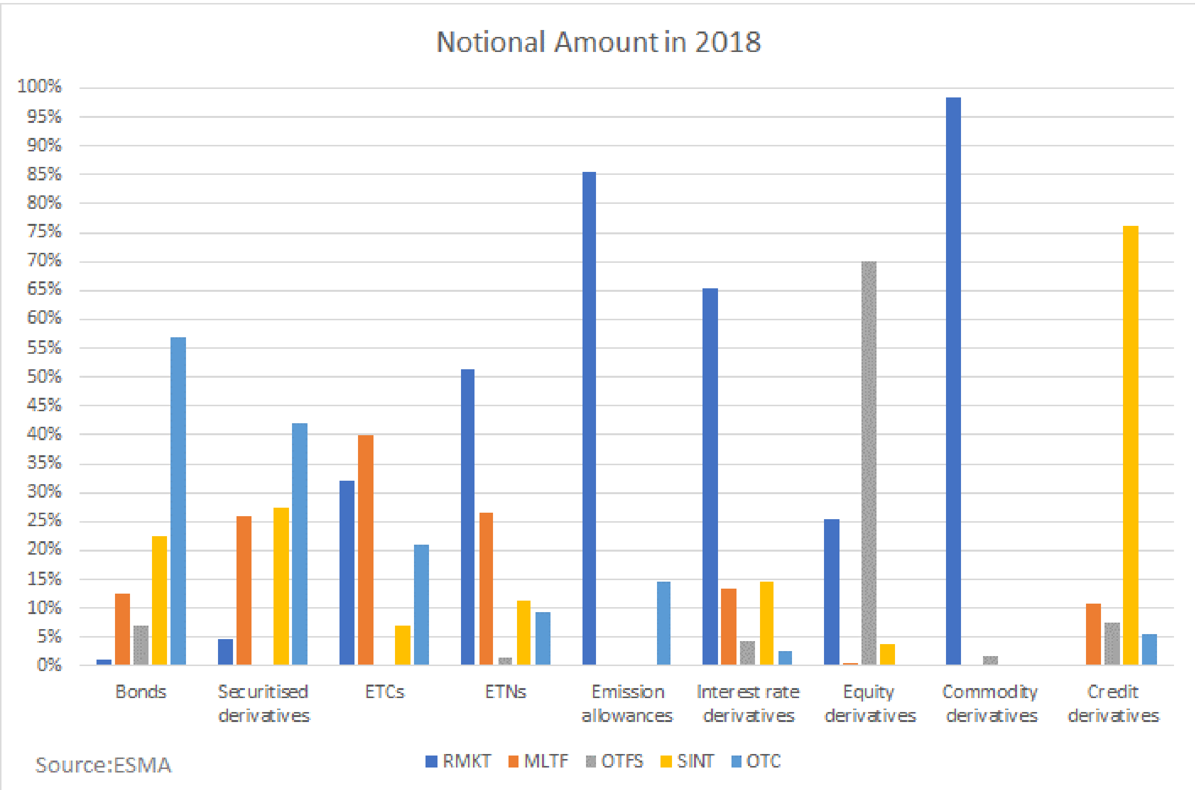
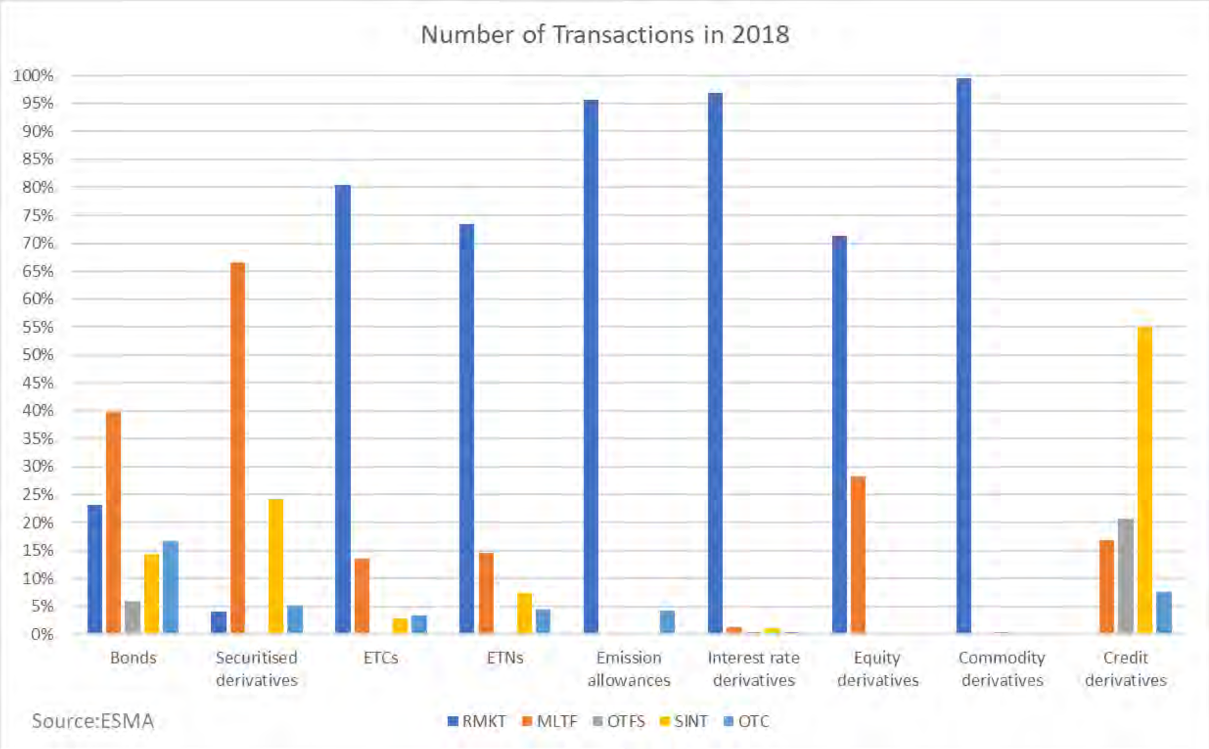


FIGURE 9 NUMBER OF TRANSACTIONS, PER EXECUTION VENUE AND ASSET CLASS, 2018



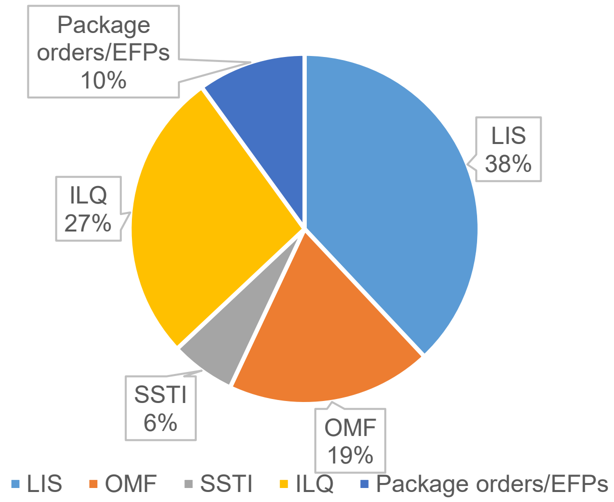
Use of pre-trade waivers

49. Finally, assessing the use of the different available types of waivers also provides valuable information on the level of pre-trade transparency. Since the application of MiFID II, ESMA received a high number of waiver notifications for non-equity instruments. In 2018, including waiver notifications sent in anticipation of MiFID II, ESMA received 649 non-equity waiver notifications.

50. Out of these 649 waiver notifications 109 notifications have been withdrawn/put on hold (including notifications on which ESMA expressed concerns that they may not be MiFIR compliant) or not processed since they were received from Member States of the EEA pending the incorporation of MiFID II/MiFIR into the EEA agreement. Out of the remaining 540 waiver notifications received, 388 have been processed and ESMA issued 377 positive opinions (i.e. opinions deeming the proposed waiver functionality compliant with MiFIR and RTS 2 requirements) and, 11 negative opinions (i.e. opinions deeming the functionality non-compliant with MiFIR and RTS 2 requirements).

51. Among the applications, the requests are most frequently related to LIS (Article 9(1)(a) of MiFIR), Illiquid (ILQ) (Article 9(1)(c) of MiFIR) and OMF waivers (Article 9(1)(a) of MiFIR): the three types of applications jointly account for 84% of the total requests. 10% of waiver requests covered package orders and/or EFPs and only 6% of waiver requests were for SSTI waivers (see Figure 10 below).

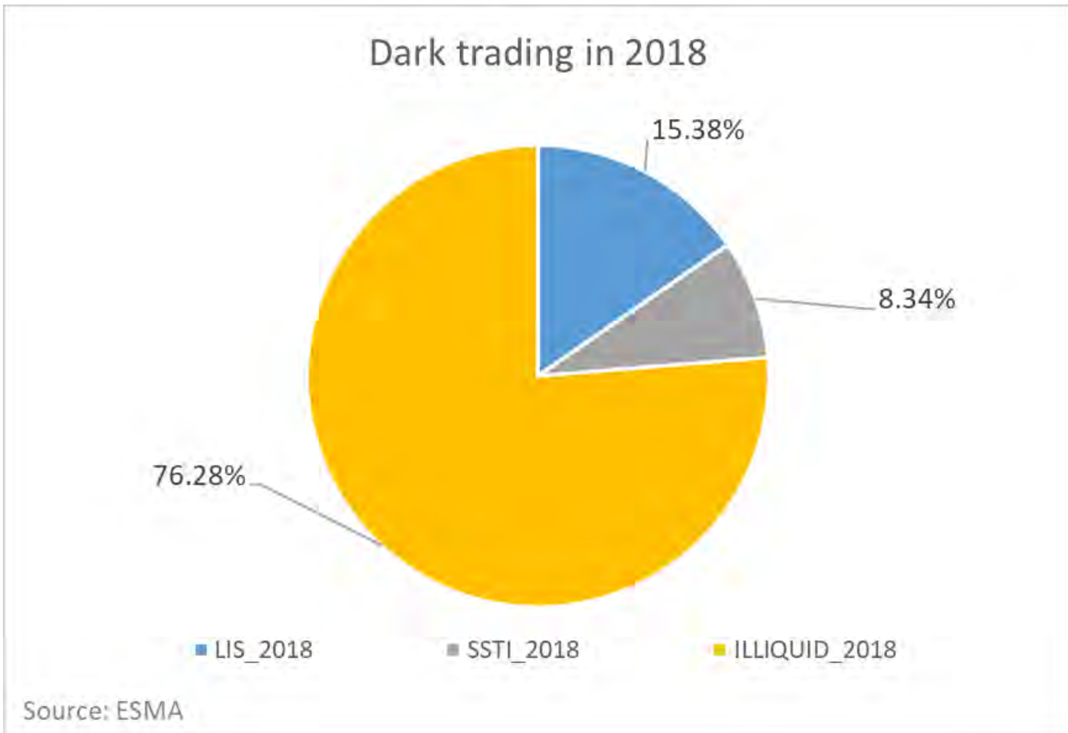
FIGURE 10 WAIVER REQUESTS, PER WAIVER TYPE, 2018



Source: ESMA

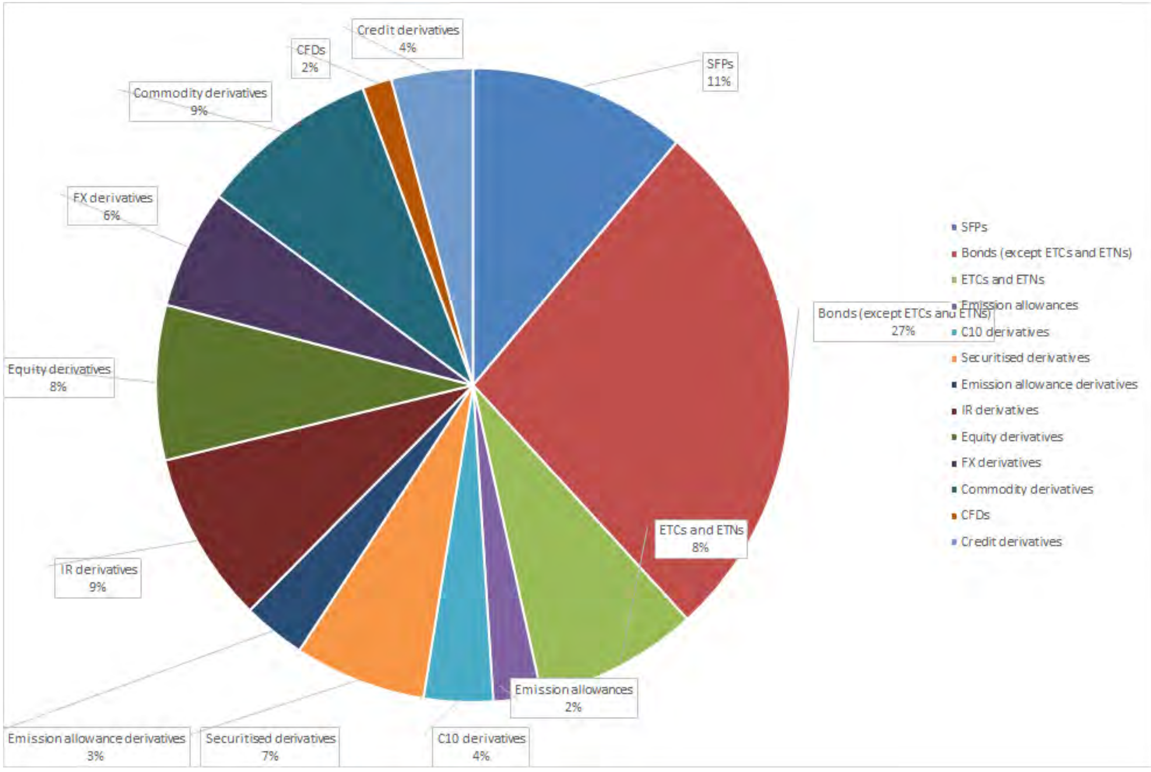
52. As can be seen from Figure 11 below, the waiver most frequently used in practice is the ILQ waiver, corresponding to a notional trading volume of 76.28% of all transactions concluded under a waiver from pre-trade transparency in 2018. The LIS waiver is the second most important waiver in terms of trading volume with 15.38%, the SSTI waiver accounts for 8.34% of total trading volume and the trading volume concluded under the OMF and package order waivers is marginal. These figures should be read keeping in mind that the size of the trading activity executed under a specific waiver is also related to the overall trading activity of a specific class of instruments. In other words, the bigger the overall trading for a specific class of instruments, the bigger should be the trading under the waivers for that class. Unfortunately, it is not possible to compare the data received through the data collection, launched on an ad-hoc basis for this CP, and related to the trading volume executed under waivers with that reported to FITRS which relates to the total trading volume executed for the class.

FIGURE 11 NOTIONAL TRADING VOLUMES UNDER WAIVERS, PER WAIVER TYPE, 2018



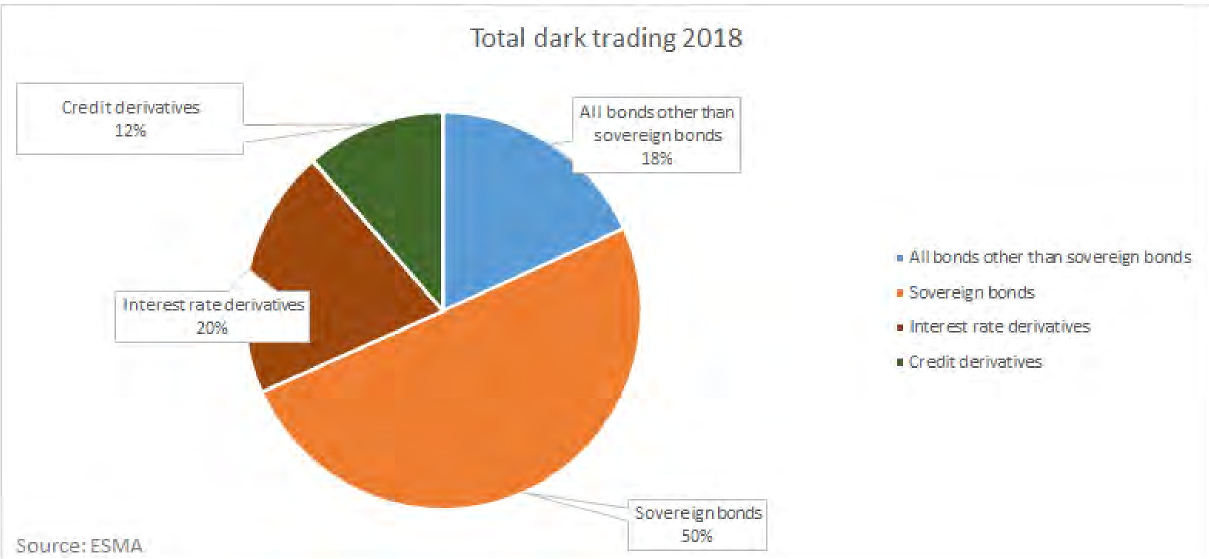
53. When comparing the number of waiver requests per asset class in 2018 (Figure 12 below) to the notional trading volume concluded under waivers per asset class in 2018 (Figure 13) it can be seen that most waiver requests were received for the asset classes of bonds (27%) which also accounts by far for the largest trading volumes under waivers with 68% (sovereign bonds and other types of bonds). When looking however at the remaining asset classes, a discrepancy between the waiver requests and the notional trading volume per asset class can be noted. Whereas many waiver requests cover the asset classes SFPs (11%), commodity derivatives (9%), interest rate derivatives (9%) and equity derivatives (8%), Figure 13 reveals that the remaining 32% of trading volume are split between interest rate derivatives (20%) and credit derivatives (12%) with only very little trading volume in the remaining asset classes.

Figure 12 Waiver requests, per Asset Class, 2018



Source: ESMA

Figure 13 Notional trading volumes under Waivers, per Asset Class, 2018

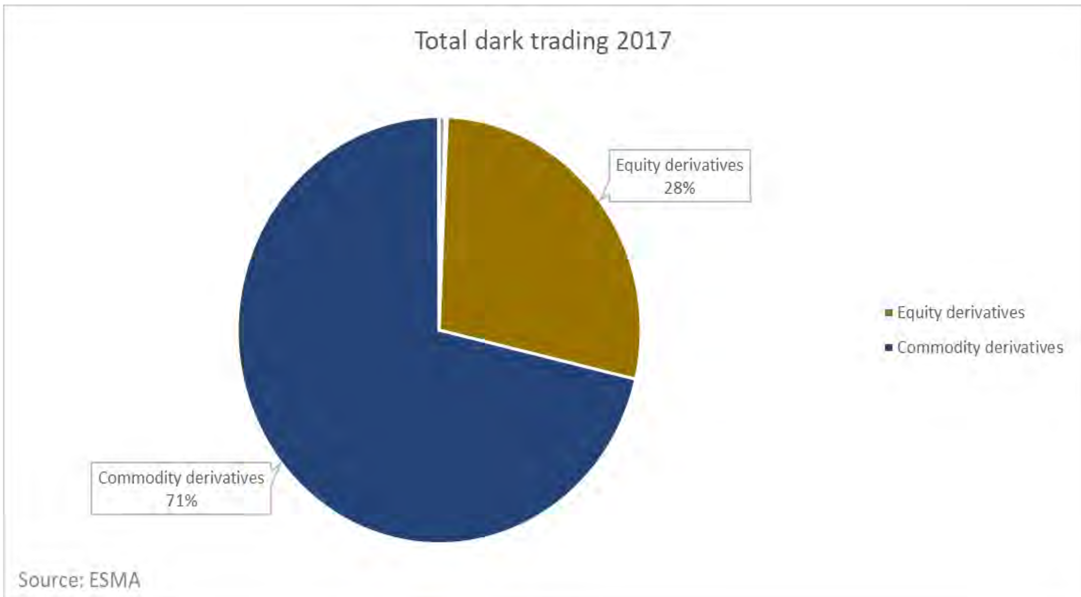


54. As explained above, non-equity instruments were not subject to a mandatory pre-trade transparency regime before the application of MiFID II/ MiFIR. Nevertheless, in order to compare the pre-trade transparency in the EU before and after MiFID II/ MiFIR, ESMA

collected data on the trading activity executed across trading venues on the use of waivers in place in 2017 on a national level.

55. When comparing the orders/quotes benefitting from a waiver in 2018 to orders/quotes not subject to pre-trade transparency in 2017 (see Figure 11 above and Figure 12 below), it can be observed that in 2017 orders/quotes not subject to pre-trade transparency covered mainly equity derivatives (28%) and commodity derivatives (71%), with the share of the other asset classes being marginal. In 2018, it can be noted that most notional trading volume under waivers was concluded in sovereign bonds (50%), interest rate derivatives (20%), bonds other than sovereign (18%) and credit derivatives (12%). However, ESMA considers that it is difficult to draw conclusions since, as mentioned above, there was no mandatory regime in 2017 and the data collected might not give a comprehensive picture of dark trading in non-equity instruments before the application of MiFIR.

FIGURE 14 NOTIONAL TRADING VOLUMES UNDER WAIVERS, PER ASSET CLASS, 2017



56. As can be seen from Figure 15 below, the use of waivers types is very heterogenous across asset classes. For instance, the use of waivers is quite different between sovereign bonds and other types of bonds. Whereas for other types of bonds nearly 80% of the trading volumes were executed under the ILQ waiver, the ILQ waiver for sovereign bonds covered only 45% of the total notional trading volume (and only 4% of transactions). For sovereign bonds the use of other waivers was more important than for other types of bonds. In particular, 45% of notional trading volume and 93% of transactions for sovereign bonds was executed under the LIS waiver compared to 15% of notional trading volume and 8% of number of transactions for other types of bonds. As far as the SSTI waiver is concerned, 9% of notional trading volume was executed under the SSTI waiver for sovereign bonds compared to 5% for other types of bonds.

57. Similarly, when comparing the use of waivers for interest rate derivatives and for equity derivatives, it can be observed that the vast majority of interest rate derivatives and credit

derivatives traded under a waiver used the ILQ waiver (88% for interest rate derivatives and 98% for credit derivatives) whereas 90% of waiver trading in terms of notional volume for equity derivatives is concluded under the LIS waiver (most equity derivatives are considered to have a liquid market by default according to RTS 2). For commodity derivatives it can be observed that the ILQ waiver is the most used waiver (81% of trading volume in 2018), but that there is also significant trading under the hedging exemption (11%) that is of no relevance for the other asset classes displayed here.

58. Overall, the notional trading volume under the OMF waiver is rather low, which is most likely linked to the use of different trading protocols in non-equity market compared to equity markets. Whereas order book trading is the standard for equity markets, it is less frequently used for non-equity markets which use rather RFQ or voice trading systems. It can be seen from Figure 15 below that for asset classes where some trading is concluded on order books (e.g. equity derivatives, bonds, some commodity derivatives) the OMF waiver is more commonly used.

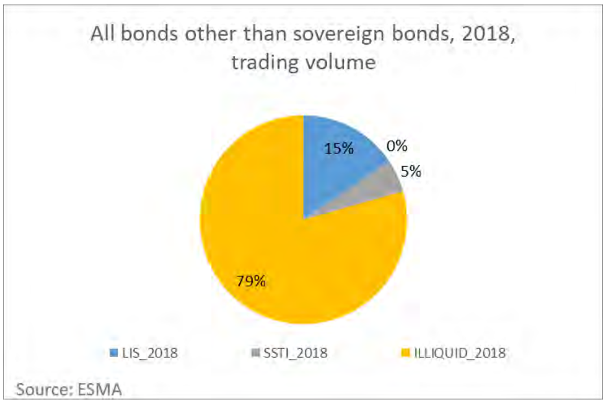
59. The different use of waivers across asset classes is also reflected when looking at the number of transactions benefitting from a waiver. In most cases, the use of waivers is similar for both volume and number of transactions. However, some differences between the use of waivers per asset classes when comparing the volume and number of transactions can be observed. Most notably, for equity derivatives, it can be observed that while only 5% of the trading volume under a waiver benefits from an OMF waiver, 84% of the number of transactions benefit from the OMF waiver.

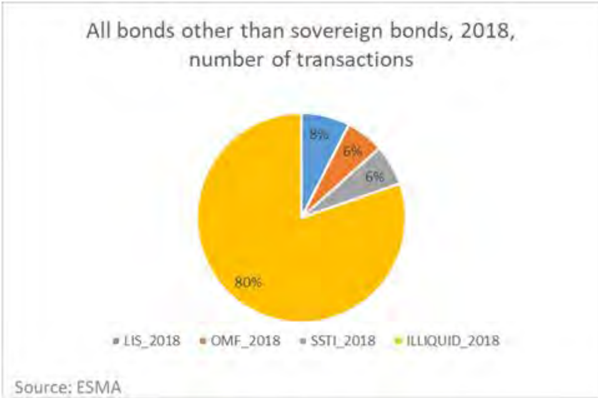
60. Furthermore, for commodity derivatives, while 11% of the volume of transactions under a waiver benefits from the hedging exemption[7], the use of the hedging exemption is significantly higher with 70% when looking at the number of transactions under a waiver. This indicates that the hedging exemption is used in particular for transactions of a small size.

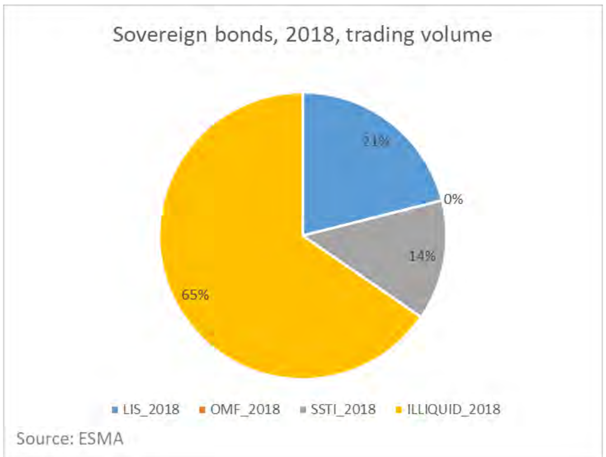
61. The use of waivers reflects the typical waterfall approach chosen by many trading venues (in particular MTFs and OTFs). Under this approach, the trading venue checks first whether the ILQ waiver can be used. Where the ILQ waiver cannot be used, the venue then assesses whether the order is eligible for a LIS waiver. Should the order be neither eligible for an ILQ or LIS waiver, venues operating RFQ- and voice trading systems then check whether the order is eligible for a SSTI waiver. In many cases, orders or quotes will only be subject to pre-trade transparency where no waiver is available and, based on ESMA's experience when assessing waiver requests, many MTFs and OTFs do not accept orders that cannot benefit from a waiver from pre-trade transparency.

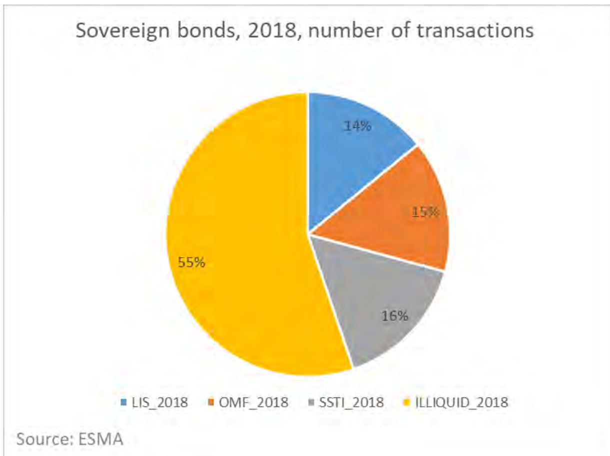
[7] Even though, under MiFIR, the hedging exemption does not qualify formally as a pre-trade waiver, it also in practice exempts the concerned transactions from pre-trade transparency (see the relevant section of the CP). For this reason, ESMA has considered appropriate to analyse it together with other waivers of Article 9 of MiFIR.

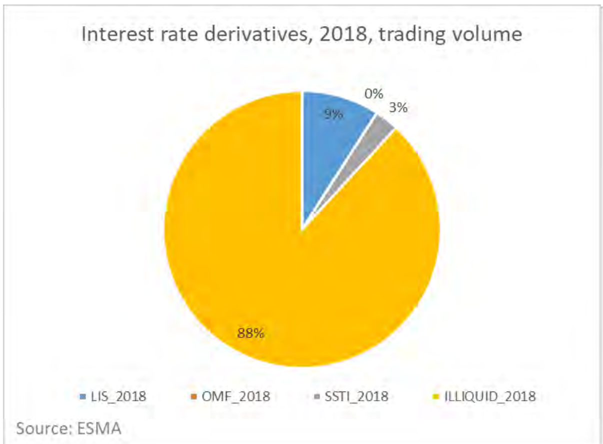
FIGURE 15 TRADING VOLUME AND NUMBER OF TRANSACTIONS PER WAIVER TYPE FOR SELECTED ASSET CLASSES, 2018

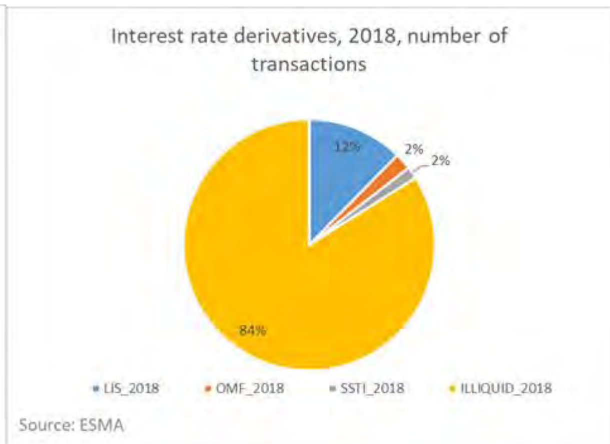


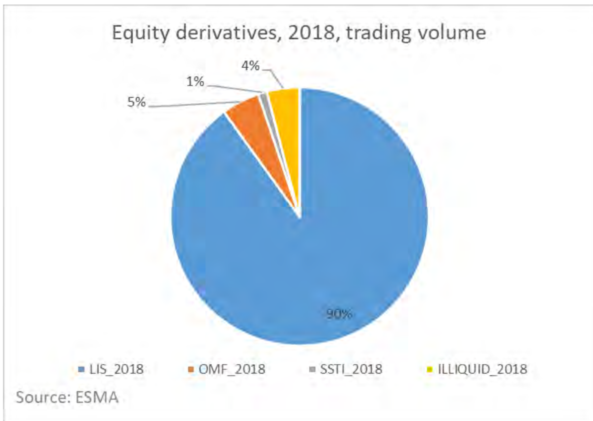


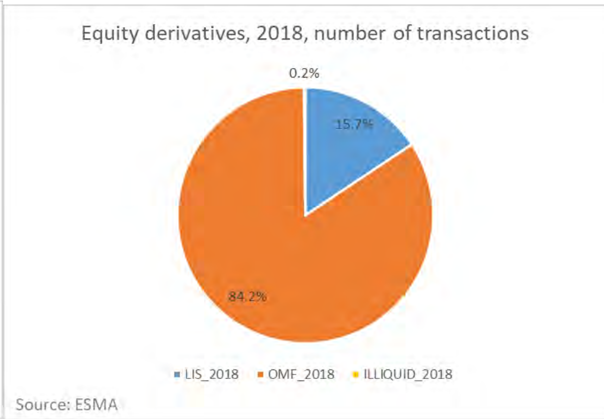


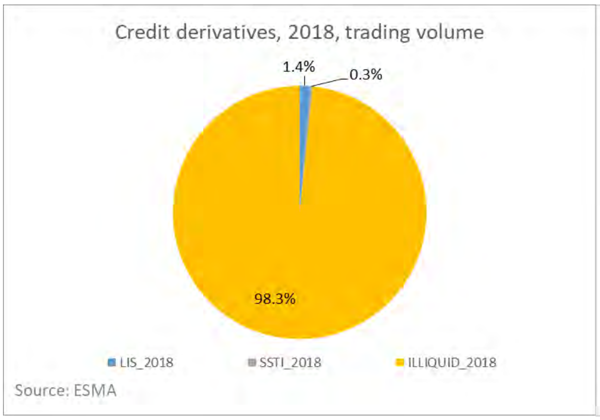


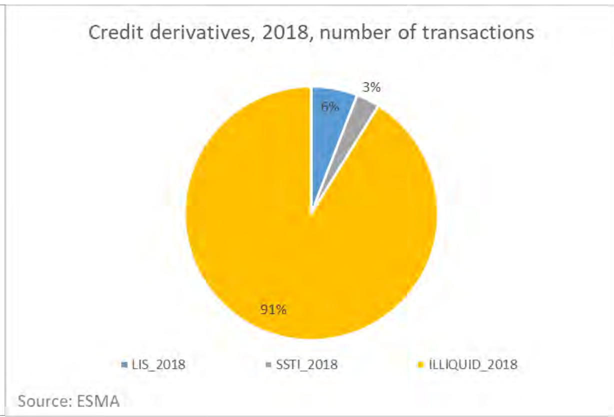


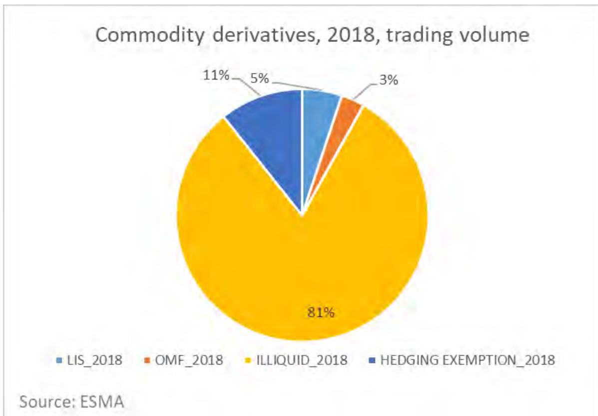


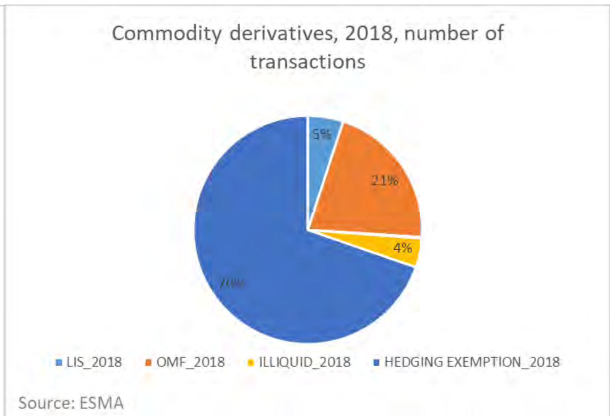












62. Last but not least, 25% of waiver notifications received by ESMA were for pre-arranged transactions, i.e. transactions that are negotiated bilaterally and formalised on a trading venue. For instance, about 40% of requests for LIS waivers were for pre-arranged transactions. Lastly, it should be noted that a number of trading venues operate trading

systems with limited price formation for non-equity instruments, such as volume auctions (about 8% of all waiver requests were for periodic auction trading systems[8]).

63. This information also indicates that currently the volume of genuine and price-forming on-venue trading in non-equity instruments is very limited.

B. Conclusions

64. In summary, ESMA preliminary assessment of the level of pre-trade transparency points to the following.

65. The overall level of pre-trade transparency appears to be limited due to the high share of financial instruments benefitting from a waiver, in particular the ILQ waiver and the high market share of transactions concluded OTC or on SIs (in particular in terms of notional amount, close to 30%). However, it can be noted that the situation significantly differs per asset class. For some asset classes, a significant amount of trading, due to different reasons, is executed on trading venues (e.g. commodity derivatives, interest rate derivatives), whereas for other asset classes only little trading activity is concluded on trading venues (e.g. bonds and credit derivatives). Finally, it should also be considered that third country venues may also be taken into account by market participants in their decision process.

66. There is a link between the liquidity status of an instrument as determined under the methodology of RTS 2 and the notional trading volume of pre-trade transparent trading. This is also reflected in the use of waivers, where for asset classes with mostly illiquid instruments, the ILQ waiver is mainly used. While most waiver notifications received by ESMA were for LIS waivers, more than 75% of the notional trading volume concluded under a waiver benefits from an illiquid waiver.

67. One possibility to increase the level of pre-trade transparency could be to lower the thresholds for determining the liquidity status of (classes of) instruments. This would result in more liquid instruments which could not benefit from the illiquid waiver. As a result, to still waive the pre-trade transparency obligations they would need to meet for example the trade size conditions necessary to use the LIS waiver. However, ESMA recognises that for non-equity instruments other than bonds, the first regular transparency calculations will only be published in May 2020. Hence, the first regular transparency calculations may result in a higher share of liquid instruments, since the transitional transparency calculations (TTC) were performed at the time APAs were not operating, thus the results reflected more on-venue trading, under the assumption of the use of good quality data. Indeed, there remain a number of issues for data of non-equity instruments that, at times, might undermine the quality and validity of the results.

68. ESMA will continue working towards improving data quality and will closely monitor developments in the liquidity status of instruments. Where needed, in order to establish

[8] See ESMA (2019): Annual Report on the application of waivers and deferrals, ESMA70-56-1010, 9 October 2019, p. 23.

some meaningful transparency, ESMA stands ready to revise RTS 2 to increase the share of liquid instruments. Such amendment should in ESMA's view also consider FX derivatives, which are currently considered as illiquid mainly because of continuing data quality issues preventing ESMA to conduct the necessary analysis.

69. As far as the other types of waivers are concerned, only little trading volume was executed under the SSTI, OMF, package order/EFP waivers and the hedging exemption. Nevertheless, in terms of number of transactions, the OMF waiver is significantly used for equity derivatives and many transactions benefit from the hedging exemption for commodity derivatives.

70. Overall, ESMA considers that the level of pre-trade transparency in non-equity markets remains limited following the application of MiFID II. This low level of pre-trade transparency does not come unexpected due to the market structures prevalent in many non-equity markets and due to the cascade of waivers available in Level 1 which turns real-time transparency into an exception rather than the norm. ESMA therefore sees benefit in making the Level 1 text significantly less complex and would like to explore whether it is worth reducing the number and scope of the waivers available.

Q1: What benefits or impacts would you see in increased pre-trade transparency in the different non-equity markets? How could the benefits/impacts of such pre-trade transparency be achieved/be mitigated via changes of the Level 1 text?

Q2: What proposals do you have for improving the level of pre-trade transparency available? Do you believe that the simplification of the regime for pre-trade transparency waivers would contribute to the improvement of the level of pre-trade transparency available?

3.1.2.2 SSTI waiver

A. Analysis

71. Compared to the other non-equity waivers, only AIOIs in a subset of trading systems (RFQ and voice-trading systems) may be eligible for the SSTI waiver, and pre-trade transparency is only partially waived since trading venues have to publish indicative information on the level of prices available.

72. In order to be eligible for the SSTI waiver, orders must be above a size specific to the financial instrument, which would expose liquidity providers to undue risk and takes into account whether the relevant market participants are retail or wholesale investors. When calibrating the SSTI thresholds, both for pre-trade as well as post-trade transparency, ESMA considered that the main market participants in RFQ and voice-trading systems are wholesale market participants, with only little or no participation of retail investors. The quoting obligations of Article 18 of MiFIR do not apply to SIs when they deal in sizes

above the SSTI threshold (Article 18(10) of MiFIR)[9]. When looking at the use of the SSTI-waiver, the following can be observed:

- Only 6% of waiver requests (23 notifications) processed by ESMA in 2018 were for the SSTI waiver. 61% of the waiver requests were for voice trading systems, the remaining 39% for RFQ systems. The SSTI-waiver is in particular used by OTFs, followed by MTFs. In addition, ESMA processed 14 SSTI waiver requests for package orders as set out under Article 9(1)(e)(5)(iii) of MiFIR (3.5% of waiver requests)[10].

- The SSTI-waiver is mainly used by UK trading venues. Given that most OTFs are currently established in the UK, this is not surprising. Also, some Spanish trading venues operate under the SSTI waiver.

- About 8% of volume in terms of notional trading volume (6% in terms of total number of transactions) traded under a waiver benefitted from an SSTI waiver. The SSTI-waiver is notably used to trade bonds, in particular sovereign bonds. From Figure 16 below, it can be noted that close to 82% of the notional trading volume per asset class under the SSTI waiver can be allocated to sovereign bonds and 11% to other types of bonds. Finally, 11% of the notional trading volume under the SSTI-waiver is concluded in credit derivatives and 6% in interest rate derivatives. There is only marginal trading volume in the remaining asset classes.

FIGURE 16 NOTIONAL TRADING VOLUME BENEFITTING FROM SSTI-WAIVER, PER ASSET CLASS, 2018

73. ESMA is of the view that the SSTI waiver results in a number of disadvantages:

[9] For a detailed discussion on the SI-regime for non-equity instruments, see the ESMA CP published on 3 February 2020 (ESMA70-156-1757).
[10] See ESMA (2019): Annual Report on the application of waivers and deferrals, ESMA70-56-1010, 9 October 2019, p. 18 onwards

- The SSTI-waiver adds further complexity to an already complex pre-trade transparency regime by adding yet another threshold to be assessed. It should be noted that this concept is currently not applied in any other non-EU jurisdiction;

- The limited transparency disclosed for quotes benefitting from the SSTI-waiver is at best meaningless and may even result in more ambiguity for market participants.

- The SSTI waiver grants a preferential treatment to RFQ- and voice-trading systems compared to other trading systems. Moreover, due to the lack of consistent classification of trading systems (see Section 3.1.2.4), and in particular for RFQ-systems, there is a high risk of the inconsistent granting of the SSTI-waiver across the Union, which may further distort the level playing field. For instance, when preparing opinions on SSTI-waivers, ESMA identified a number of systems that, while labelled as an RFQ-system, did not meet the RFQ definition.

- Notifications for SSTI-waivers are burdensome to process for both market participants, CAs and ESMA due to the many elements to be assessed. Given the limited take up of the SSTI-waiver and the arguments set out above, this could be considered as excessive bureaucracy without added value.

B. Conclusions and Proposals

74. For the reasons set out above, ESMA is suggesting to delete the SSTI-waiver.

75. ESMA is aware that the deletion of the SSTI waiver could increase the importance of the use of the other waivers, in particular of the LIS waiver which would put into question the benefit of the deletion in terms of pre-trade transparency, especially also considering that the SSTI waiver is only available for RFQ and voice trading systems. However, the LIS waiver is only available for orders of a certain size and orders below the LIS threshold would be subject to pre-trade transparency (in particular orders above the SSTI and below the LIS threshold which currently benefit from the SSTI waiver).

76. At the same time, ESMA recognises that it is important to provide liquidity providers in thin markets with the necessary protection against market risks, since otherwise there is a risk that liquidity providers may withdraw from markets.

77. Therefore, ESMA proposes to compensate the deletion of the SSTI-waiver for non-equity instruments, by lowering the pre-trade LIS-thresholds. Such an approach would significantly simplify the pre-trade transparency regime while allowing to continue protecting liquidity providers, provide for a level-playing field across the different trading systems, since the LIS-waiver is available for any type of trading systems, as well as provide more clarity to market participants and reduce bureaucracy.

78. Such an amendment would require an amendment of the Level 1 text (deletion of the SSTI-waiver) and a recalibration of the LIS-threshold in RTS 2 (level 2 change). ESMA considers that under such a proposal the pre-trade LIS-threshold would need to be re-calibrated but should in any case remain higher than the current SSTI-threshold to ensure

that pre-trade transparency is the rule and not an exception and to increase the overall level of transparency. Given that the SSTI-waiver is in particular used for sovereign bonds, it could be considered to reflect this by providing a lower LIS-threshold for sovereign bonds compared to other types of bonds and/or other asset classes.

79. In consequence of deleting the SSTI-waiver under Article 9(1)((b) of MiFIR, ESMA suggests also to delete the SSTI package order waiver under Article 9(1)(e)(iii) of MiFIR.

Q3: Are you supportive of ESMA's proposal to delete the pre-trade SSTI-waiver? Would you compensate for this by lowering the pre-trade LIS-thresholds across all asset classes or only for selected asset classes? What would be the appropriate level for such adjusted LIS-thresholds? If you do not support ESMA's proposal to delete the pre-trade SSTI-waiver, what should be the way forward on the SSTI-waiver in your view?

80. Furthermore, ESMA is interested in feedback from stakeholders how such proposal might affect the use of the SSTI for the SI quoting obligations under Article 18 of MiFIR. One option could be to keep the concept of SSTI for the SI quoting obligations, similar to the concept of standard market size (SMS) for equity instruments, which is only used in context of the SI-obligations (Option 1). Another option could consist in removing the SSTI-concept also for the SI-quoting obligation and to replace it by a reference to the LIS. For instance, SIs could be subject to the quoting obligations of Article 18 of MiFIR up to a certain percentage of the LIS threshold (Option 2). Option 1 could be delivered without changes to the Level 1 text, whereas option 2 would require changing level 1 and 2. ESMA considers that option 2 would however simplify the regime and the calculations to be undertaken by ESMA to calculate the SSTI thresholds.

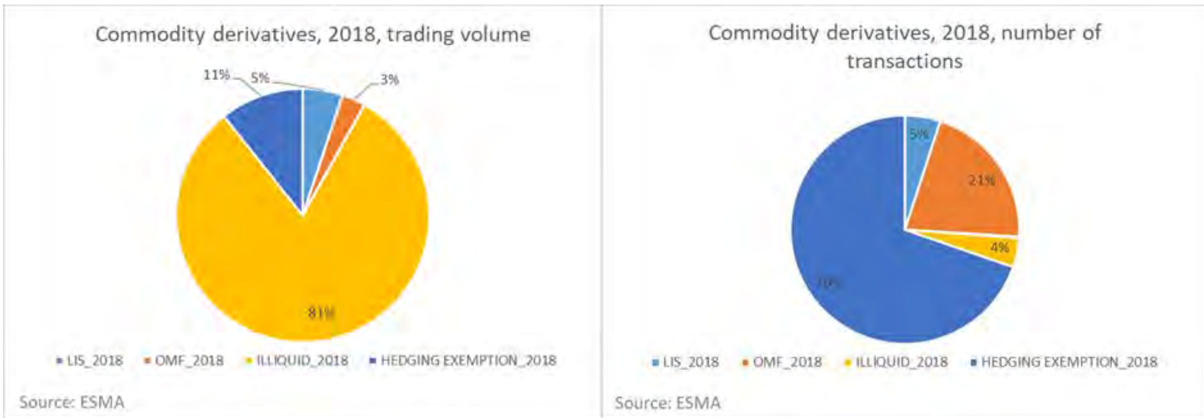
Q4: What are your views on the use of the SSTI for the SI-quoting obligations. Should it remain (Option 1) or be replaced by linking the quoting obligation to another threshold (e.g. a certain percentage of the LIS-threshold) (Option 2)? Please explain.

3.1.2.3 Hedging exemption and negotiated trades

A. Analysis

81. Based on data received by ESMA, currently the hedging exemption is only used for commodity derivatives. In particular, 11% of the notional trading volume and 70% in terms of number of transactions in commodity derivatives is benefitting from the hedging exemption (see Figure 17 below).

FIGURE 17 USE OF HEDGING EXEMPTION FOR COMMODITY DERIVATIVES COMPARED TO WAIVERS



82. The pre-trade transparency exemption for hedging derivative transactions executed by non-financial counterparties under Article 8 of MiFIR has been a source of uncertainty for some market participants and trading venues as pre-trade transparency typically applies to orders whilst transactions are subject to post-trade transparency.

83. To ensure a converging application of this exemption and contribute to a level playing field across trading venues, ESMA published a Q&A clarifying that this pre-trade transparency exemption may only be used for the formalisation of pre-arranged derivative transactions where at least one of the counterparties to the transaction is a non-financial counterparty, the transaction is in derivative instruments, and the transaction has to as a result reduce risks directly relating to the commercial activity or treasury financing activity of the non-financial counterparty or of that group. ESMA further clarified that the exemption is not applicable to orders and quotes.

84. Therefore, ESMA considers more clarity and legal certainty should be provided for the application of the hedging exemption.

B. Conclusions and Proposals

85. ESMA considers that there would be merit in providing more clarity and in increasing legal certainty for market participants by turning the exemption provided for in Article 8 of MiFIR into a pre-trade transparency waiver under Article 9(1) of MiFIR.

86. The scope of this new pre-trade transparency waiver for negotiated transactions would mirror the conditions currently set out in Article 8 for the pre-trade transparency exemption. It would apply to pre-arranged or negotiated transactions in derivatives where at least one counterparty to the transaction is a non-financial counterparty and where the transaction results in reducing risks directly relating to the commercial activity or treasury financing activity of the non-financial counterparty or of that group.

87. ESMA considers two possible options with regard to the scope of application of this new pre-trade transparency waiver for negotiated transactions:

- Option 1: the waiver could be requested for any type of derivative;

- Option 2: as based on the data received by ESMA, the hedging exemption is currently only used for commodity derivatives, Option 2 would limit the scope of this negotiated trade waiver to risk reducing transactions in commodity derivatives only.

88. In all cases, ESMA is not minded to extend the scope of such pre-trade transparency waiver for negotiated trades beyond that of the hedging exemption so as not to impair the level of pre-trade transparency currently available for non-equity instruments. However, where a transaction or the instrument traded would not be eligible to this negotiated trade waiver, trading venues would continue to be able to formalise pre-arranged or negotiated transactions provided that a relevant waiver is available under Article 9(1) of MiFIR (e.g. an LIS or ILQ waiver).[11] The reference to the hedging exemption in Article 8 of MiFIR would be deleted.

Q5: Would you support turning the hedging exemption into a limited negotiated trade waiver? If so, would you support Option 1 or Option 2? If not, please explain why.

3.1.2.4 Emergence of new trading systems and inconsistent classification of trading systems

A. Analysis

89. Article 8(2) of MiFIR sets out a list of different types of trading venues for which pre-trade transparency requirements must be calibrated, including orderbook, quote-driven, hybrid, periodic auction trading and voice trading systems. Annex I of RTS 2 provides a short description of each of those trading systems, as well as of RFQ systems, together with the related pre-trade information to be made public.

90. The waiver notifications received demonstrated a wide variety of trading systems used by trading venues, elaborating in particular on RFQ and periodic auction systems, with a related pre-trade impact.

91. With regards to RFQ systems, the description provided in Annex I of RTS 2 proved insufficient to ensure a shared interpretation of the characteristics of such systems. ESMA had to issue some Q&As to further clarify that the definition did not foresee the possibility for a participant initiating an RFQ to further negotiate the quote received from the RFQ respondent to agree on the final details of the transaction. Where such further negotiation is taking place, it should be considered as a separate trading process outside the initial RFQ session. This clarification of the definition of RFQ systems proved necessary in particular with respect to pre-trade transparency as only RFQ systems, together with voice trading systems, are eligible to the SSTI waiver.

[11] See ESMA Questions and Answers on MiFiD II and MiFIR transparency topics, page 51.

92. When processing the pre-trade transparency waiver requests, ESMA also noted that trading venues are operating a variety of functionalities that share some of the characteristics of RFQ systems whilst not exactly meeting the definition of RFQs systems as set out in Annex I of RTS 2. These include for instance Request-for-Trade (RFT) functionalities where a participant would send an AIOI to another participant without being requested to or Quote-Posting-Functionalities (QPF) where one participant would post AIOIs to other eligible participants. Since those trading functionalities are being qualified as "hybrid" systems, they offer significant leeway to trading venues to decide on the level of pre-trade-transparency they consider appropriate to make available.

93. With regards to periodic auctions, the description provided in Annex I of RTS 2 was initially intended to cover the long-established opening and closing auctions used to set the price of an instrument at the beginning or end of the trading day as well as intra-day auctions that aggregate liquidity at a couple of points in time throughout the day or that are used to resume trading after a market volatility interruption.

B. Conclusions and Proposals

94. The description of trading systems in Annex I of RTS 2 does not appear to provide the necessary flexibility to accommodate market developments and the potentially novel regulatory issues they raise, including with respect to pre-trade transparency. As proposed for the equity and equity-like instruments regime, ESMA therefore proposes that when a new trading system emerges that is not, or was not intended to be, covered by the first five rows of Annex I of RTS 2, ESMA would issue an Opinion specifying its definition and the pre-trade information to be made public in accordance with Article 2 of RTS 2 and building on the pre-trade transparency requirements for existing trading systems. This would require the introduction of a mandate for ESMA in Level 1. Level 2 would further clarify the process and timeline for such Opinions.

Q6: Do you agree with ESMA's observations on the emergence of new trading systems and the proposed way forward requiring a Level 1 change and ESMA to issue an Opinion for each new trading system defining its characteristics and the transparency requirements? Would you have suggestions for the timeline and process of such Opinions? Please explain.

95. In addition, ESMA notes that the last row in Annex I of RTS 2 should be amended to review the definition of a hybrid system. A trading system that falls within two or more of the five rows, such as a trading system that combines an opening auction followed by continuous order book trading and a closing auction does not qualify as a hybrid system eligible to bespoke pre-trade transparency obligations. Such trading system has to meet the pre-trade transparency obligations that apply to each relevant row or component part of the overall system. Therefore, ESMA proposes to further clarify the definition of a hybrid system in Annex I of RTS 2.

Q7: Do you agree with the proposal for amending the definition of hybrid system? Are there in your view trading systems currently not or not appropriately covered in RTS 2 on which ESMA should provide further guidance? Please explain.

3.1.2.5 Quality of pre-trade transparency information published

A. Analysis

96. Trading venues are required to publish the range of bid and offer prices and the depth of trading interest at those prices in accordance with the type of trading system they operate. The information requirements per type of trading system are specified in Annex I of RTS 2.

97. Moreover, according to Article 18 of MiFIR SIs also have to make public firm quotes for liquid non-equity instruments below the SSTI-threshold. ESMA clarified in a Q&A that SIs – as for equity instruments – are required to make the information available through at least one of the following means: proprietary arrangements, APAs or the facilities of a regulated market which has admitted the financial instrument in question to trading. There is currently no further specification on the information (content and format) to be published by SIs. However, ESMA provided guidance in a Q&A that pre-trade transparency information published by trading venues and SIs should allow identifying unequivocally the financial instrument to which the information published refers, for instance via the use of ISINs[12].

98. Based on information received from 40 SIs in the context of ESMA's work on the review report on non-equity SIs, currently about half of SIs publish pre-trade information via APAs. A few SIs do not publish any quotes since they are only active in illiquid instruments which are not subject to quoting obligations. The remaining SIs publish the information via proprietary arrangements, i.e. on their website.

99. Trading venues and SIs are required to make real-time pre-trade data available on a reasonable commercial basis (RCB). Moreover, 15 minutes after publication trading venues are required to make the information available free of charge. ESMA's assessment mainly relies on the information provided free of charge. In that context it should be noted, as highlighted in the recent review report on the cost of market data and the equity consolidated tape (CT)[13] that not all trading venues are currently (fully) complying with the requirement to make pre-trade data available free of charge 15 minutes after publication. This significantly limited the analysis ESMA could perform.

100. Moreover, as presented in the section 3.1.2.1, many orders/quotes in non-equity instruments benefit from a waiver from pre-trade transparency. In consequence, no pre-trade transparency information is available for these orders, which further limits the analysis that can be performed.

101. ESMA assessed the quality of available pre-trade transparency based on information available from trading venues, APAs (when publishing quotes for SIs) and SIs operating

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[12] See Q&A 5 of the section general Q&As on transparency topics of the ESMA Q&As on MiFID II and MiFIR transparency topics.

[13] https://www.esma.europa.eu/sites/default/files/library/mifid_ii_mifir_review_report_no_1_on_prices_for_market_data_and_the_equity_ct.pdf

in the Union, taking into account the size of the entities (small and big entities) and the geographical scope of activity (national vs. EU-wide). The analysis focused on the asset class of bonds (both sovereign and other types of bonds), equity derivatives and interest rate derivatives.

102. Overall, it can be noted that there is a large variety in the approaches for publishing pre-trade data by trading venues, APAs and SIs, both in terms of how to access the information as well as in terms of the content of information disclosed.

103. Concerning the access to pre-trade data, ESMA observed the following issues:

- in many cases, no pre-trade information could be found, or the information is challenging to find on the website of these entities (this applies equally to data published by SIs, trading venues and APAs (when publishing quotes for SIs));

- where APAs publish SI quotes, different approaches can be distinguished: some APAs provide the data free of charge (either in real-time or on a delayed basis) whereas other APAs charge fees for accessing the data;

- sometimes users are required to register upfront in order to access the (delayed) quotes, a few SIs charge a fee for accessing pre-trade data;

- in some cases, quotes are presented in separate files covering only a very short time-period and using formats that are not human-readable;

- in some cases, the information is only available in the language of the jurisdiction where the trading venue, APA or SI is established, thereby making it challenging for non-local clients to access the information.

104. Concerning the content of the information published, ESMA observed the following:

- Identification of instrument: All trading venues, APAs and SIs publish the information specifying the instrument quoted. In most cases, this identification is done on the basis of the ISIN. Some trading venues, APAs and SIs, provide also a further description or categorisation of the instrument (e.g. information on issuers, further classification of the instruments).

- Heterogeneous approaches for pre-trade disclosure: Trading venues, SIs and APAs publish different details of information. While the large majority of entities publish information identifying the instrument, depth of trading interest and bid and offer prices, this information is not published in the same manner (different levels of granularity, different presentation, different acronyms used).

- Trading venues, SIs and APAs use different pricing methodologies. For instance, bonds are currently either priced in percentage or monetary value.

- For RFQ systems, there are many instances where only one quote appears per trade. While this may reflect RFQ to one systems or cases where only one quote was received in response to an RFQ, it may also be a consequence of trading venues only disclosing the RFQ quote that is selected by the RFQ-requester is disclosed.

B. Conclusions and Proposals

105. The following can be concluded from the analysis above:

- (Delayed) pre-trade information is difficult to find, data users challenge that the data is charged on a RCB and it appears that a number of trading venues and APAs are not complying with the requirement to make available pre-trade data free of charge 15 minutes after publication;

- There are various challenges for accessing pre-trade data (access restrictions, language issues, formatting);

- There are various challenges concerning the content of the data published. In particular, the absence of a common standard results in a patchwork of pre-trade information that is difficult to read and compare.

106. As already set out in the MiFID II review report on the cost of market data, ESMA will work on supervisory guidance further specifying ESMA's expectations on how trading venues, APAs and SIs should comply with the obligation to publish market data on a RCB. Furthermore, ESMA, in close cooperation with CAs, will follow-up on the compliance of trading venues and APAs with the obligation to provide market data free of charge 15 minutes after publication.

107. To improve the accessibility of quotes published by SIs, either directly or via APAs, ESMA is of the view that also SI quotes should be made available free of charge 15 minutes after publication. Such an amendment of the Level 1 text would make it easier to access SI quotes and also contribute to a level playing field between the requirements for trading venues, APAs and SIs as concerns market data.

108. To improve the usability of pre-trade data ESMA is suggesting harmonising the content and format of pre-trade transparency to be published. Hence, as for post-trade transparency, ESMA would specify the fields to be populated for the pre-trade transparency disclosure, taking into account the different trading systems operated as well as the specificities of the different non-equity asset classes. This would allow all stakeholders to understand and compare with ease the different quotes published. Such a standardisation would require an empowerment for ESMA to develop technical standards in the Level 1 text.

Q8: Do you agree with ESMA's proposal to require SIs to make available data free of charge 15 minutes after publication? Please explain.

Q9: Would you see value in further standardising the pre-trade transparency information to increase the usability and comparability of the information? Please explain.

3.2 Article 10 - Post-trade transparency requirements for trading venues and investment firms in respect of non-equity instruments

109. As part of the objective of enhancing the efficiency, resilience and integrity of financial markets, MiFIR introduces post-trade transparency requirements for trading venues and investment firms in respect of bonds, SFPs, emission allowances and derivatives ("non equity instruments") traded on a trading venue, whilst recognising the need for adaptations of the regime through deferred publication.

110. After setting out the legal framework for post-trade transparency requirements in respect of non-equity instruments under MiFID II, this section of the CP provides an assessment of the level of post-trade transparency currently available for those instruments as well as of the quality, and therefore the usefulness, of available post-trade transparency together with proposals for improvements, including to streamline the deferral regime and to have a more harmonised regime across Member States. This section also further considers the concept of traded on a trading venue (ToTV) that underpins post-trade transparency requirements for non-equity instruments and the challenge raised by its application to OTC transactions in derivative instruments. Finally, proposals are made to remove the possibility of unilateral suspensions of the transparency regime for one or more non-equity classes when there is a drop of liquidity at EU level for such class(es) due to its unclear purpose, its complex application, and also considering the fact that no NCA has made use of it until now.

3.2.1 Legal framework

111. Article 10 of MiFIR requires market operators and investment firms operating a trading venue to make public the price, volume and time of transactions in respect of non-equity instruments traded on a trading venue. The details of all such transactions must be made public as close to real-time as is technically possible and in any case within 15 minutes after the execution of the transaction for the first three years of application of MiFIR and within 5 minutes thereafter. Article 21 of MiFIR together with Article 64 of MiFID II introduce similar requirements for transactions concluded by investment firms OTC.

112. However, under Article 11 of MiFIR, CAs may allow for the deferred publication of the details of transactions in non-equity instruments based on the size or type of transactions. Deferred publication may be authorised in respect of transactions that i) are LIS compared with normal market size, ii) are related to a financial instrument or a class of instruments for which there is not a liquid market, and iii) are above a SSTI or the class of instruments which would expose liquidity providers to undue risk and takes into account

whether the relevant market participants are retail or wholesale investors. The methodology for determining the respective LIS and SSTI thresholds as well as whether a financial instrument or a class of financial instrument has a liquid market is set out in RTS 2.

113. RTS 2 clarifies that transactions benefitting from a deferral only need to be published by 19.00 local time on the second working day after the date of the transaction (T+2). Furthermore, RTS 2 clarifies that package transactions where at least one of the components is a financial instrument that is illiquid, LIS compared with normal market size or above SSTI, can also benefit from deferred publication for all their components.

114. In conjunction with an authorisation of deferred publication, each CA has the discretion to decide on the level of information to be disclosed during the initial deferral time period and allow for the publication of limited information for an extended deferral period within the boundaries set out in Article 11(3) of MiFIR and as further specified in RTS 2. In particular, CAs may allow the following:

a. During the initial deferral period of two days, CAs may request the publication of either the details of each transaction except volume or of transactions in a daily aggregated form for a minimum number of 5 transactions executed on the same day, to be made public the following working day before 09.00 local time;

b. CAs may allow the omission of the publication of the volume of an individual transaction for an extended time period of four weeks;

c. In respect of non-equity instruments that are not sovereign debt, CAs may allow, for an extended time period of deferral of four weeks, the publication of the aggregation of several transactions executed over the course of one calendar week on the following Tuesday before 09:00 local time;

d. In respect of sovereign debt instruments, CAs may allow, for an indefinite period of time, the publication of the aggregation of several transactions executed over the course of one calendar week on the following Tuesday before 09.00 local time.

115. Furthermore, point b. and d. may be used consecutively, i.e. after the lapsing of the volume omission after four weeks, transactions can be aggregated for an indefinite period.

116. Otherwise, when the deferral period elapses all details of all individual transactions must be published. RTS 2 specifies the list of flags to be used when reporting under the various deferrals.

117. Similar to the pre-trade transparency regime, CAs may also decide to temporarily suspend post-trade transparency requirements on a trading venue they supervise for a class of bond, SFPs, emission allowances or derivatives when trading volumes in that class of financial instrument on all EU trading venues over the last 30 days represents less than a certain percentage of the average monthly volume over the 12 months

preceding those 30 days (Article 11(4) of MiFIR and Article 16 of RTS 2). The percentage that may trigger a temporary suspension differs depending on whether the financial instruments are considered to have a liquid market or not. The temporary suspension is valid for an initial period that may not exceed three months and may be renewed for further periods of three months at a time.

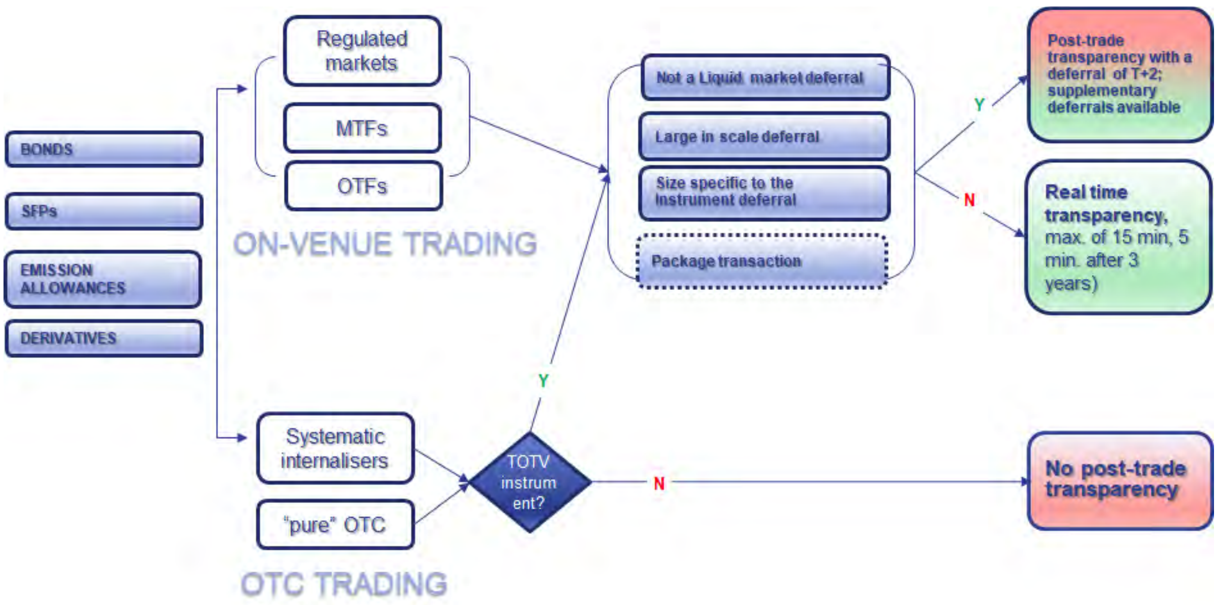
118. A similar post-trade transparency framework applies to investment firms when executing transactions in financial instruments traded on a trading venue outside a trading venue. Investment firms are required to make public the details of such transactions through an APA on the same conditions as the ones applicable to trading venues (Article 21 of MiFIR and Article 64 of MiFID II).

119. Likewise, CAs may authorise investment firms to provide for deferred publication or may request the publication of limited details of a transaction or details of several transactions in an aggregate form and may temporarily suspend post-trade disclosure by investment firms on the same conditions as the ones set forth in respect of trading venues in Article 11 of MIFIR.

120. By contrast to on-venue transactions, post-trade transparency requirements do not apply to transactions executed outside a trading venue where the exchange of financial instruments is determined by factors other than the current market valuation of the financial instrument, such as transfers of financial instruments for collateral or lending purposes or "give-ups" and "give-ins" (Article 12 of RTS 2).

121. FIGURE 18 below, provides a description of the post-trade transparency regime on- and off-venue.

FIGURE 18 THE POST-TRADE TRANSPARENCY REGIME FOR TRADING VENUES



3.2.2 ESMA's assessment of the post-trade transparency framework

3.2.2.1 Assessment of the current level of post-trade transparency and the deferral regime

A. Analysis

122. As for pre-trade transparency, the current level of post-trade transparency can be assessed along two dimensions. Firstly, by comparing post-trade transparency post-MiFID II to the level of post-trade transparency prior to MiFID II and secondly by assessing the types of deferrals used overall and per asset class.

Post-trade transparency under MiFID I vs. MiFID II

123. A number of jurisdictions already had post-trade transparency requirements in place for non-equity instruments under MiFID I. This is for instance the case for France and Italy, where post-trade transparency requirements applied to financial instruments other than shares admitted to trading on regulated markets. However, the law did not specify the timing and content of the information to be published but rather required trading venues to have in place appropriate post-trade transparency requirements taking into account the market structure, the specific features of the instrument and the size of the transactions. Specifically, in Italy, as in the case of the pre-trade transparency regime, the Consolidated Law on Finance empowered Consob to extend, in whole or in part, the post-trade transparency regime also to financial instruments other than shares admitted to trading on regulated markets, and, in the exercise of such power, Consob required under its Regulation on Markets that: (i) trading venues – as well as systematic internalisers – should establish appropriate pre-trade transparency requirements, to be set taking into account the specific features both of the market and of the instrument/transaction concerned; (ii) investment firms should make public the details (date and time, financial instrument concerned, price and quantity) of the transactions executed OTC on financial instruments admitted to trading on Italian regulated markets other than shares by the end of the next trading day.

124. As mentioned in the pre-trade section, in the UK, before MiFID II entered into force the FCA handbook set expectations in the form of guidance on pre- and post-trade transparency requirements applicable to trading venues for instruments other than shares like bonds and derivatives.

125. In Greece, the law transposing MiFID into national legislation, empowered the Hellenic Capital Market Commission (HCMC) to issue a resolution specifying the conditions for the authorisation of trading venues as well as their organisational requirements. In this context, trading venues were required to include in their rules the arrangements adopted for the post-trade transparency in respect of transactions in financial instruments other than shares.

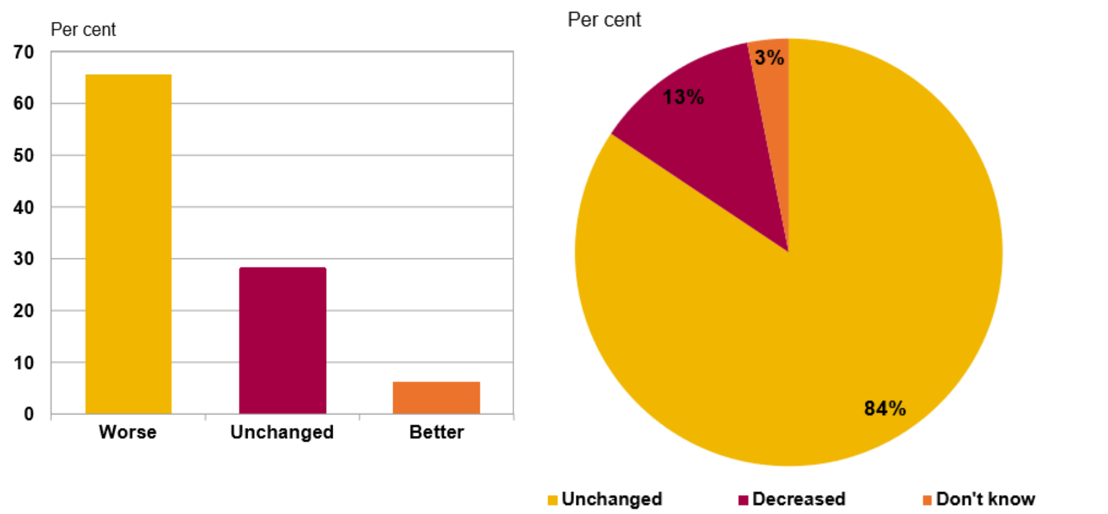
126. In addition, Sweden and Denmark had post-trade transparency requirements in place. Sweden required the publication of post-trade information on government bonds and covered bonds for a long time and applied post-trade transparency to corporate bonds

starting in 2015. The rules required the publication of the price and volume of transactions no later than 9:00 AM of the day following the transaction. With the application of MiFID II since 3 January 2018, Finansinspektionen (FI) authorised the deferred publication of the details of transactions for bonds (T+2) combined with the publication of limited details of several transactions in aggregated form when at least five transactions in a single instrument are executed on the same day. Moreover, FI authorised volume-masking for an extended period of deferral for government bonds, covered bonds and derivatives having such bonds as underlying, i.e. the volume of an individual transaction is published only after an extended period of four weeks.

127. A study[14] of FI on the impact of the MiFID II post-transparency regime to the Swedish markets for government, covered and corporate bonds, revealed that for the large majority of Swedish market participants participating in a survey transparency has decreased since the application of MiFID II (see Figure 19). Nevertheless, the study concludes that MiFID II delivered on its objective to move more trading of bonds on trading venues while at the same time noting that significant trading flow also moved to SIs (see

128. Figure 20).

FIGURE 19 PERCEPTION OF TRANSPARENCY (LEFT) AND TRADING VOLUMES (RIGHT) IN SWEDISH BONDS SINCE 2018



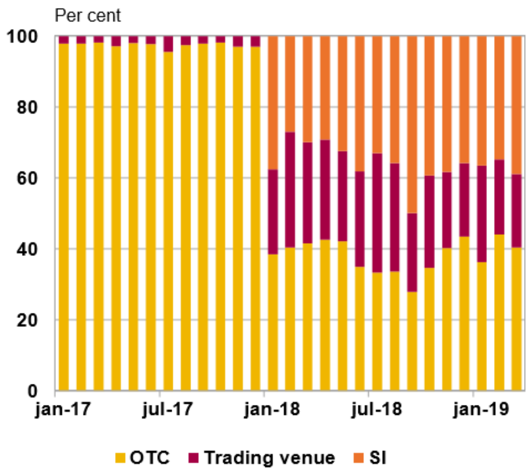
Source: FI's survey.
Note: A total of 21 respondents answered the question, "How has transparency on the Swedish market for corporate, government and covered bonds changed since MiFID II/MiFIR was introduced on 3 January 2018?"

Source: FI's survey.
Note: A total of 21 respondents answered the question, "How have the new transparency rules affected your trading volumes?"

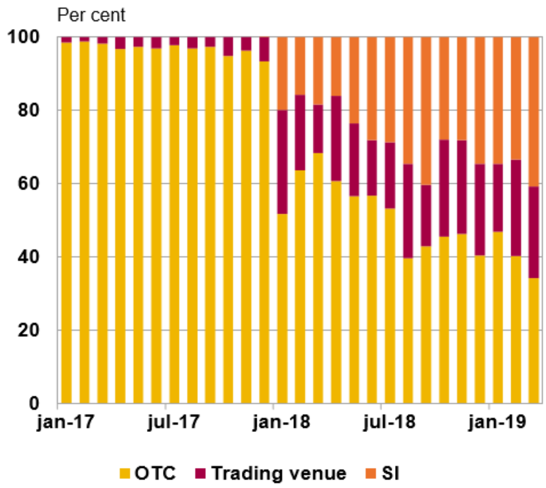
Source: Finansinspektionen

[14] https://www.fi.se/contentassets/0174249373f1415bb14bd2bd14a77307/fi-tillsyn-15-transparens-obligationsm-engn.pdf

FIGURE 20 INCREASED TRADING ON TRADING VENUES FOR GOVERNMENT AND COVERED BONDS (LEFT) AND CORPORATE BONDS (RIGHT)



Source: FI's transaction reporting system.
Note: Percentage of the transaction volume for government and covered bonds that are traded in different ways.



Source: FI's transaction reporting system.
Note: Percentage of the transaction volume for corporate bonds that are traded in different ways.

129. Furthermore, the FI study concluded that the new transparency rules have not had an impact on the trading volume and that trading patterns remained largely the same, which is consistent with the findings of ICMA covering the EU market.

130. In Denmark, the industry has reached an agreement on how to maintain the level of transparency available before MiFID II. According to this agreement, market participants committed to publish information about transactions in bonds as soon as possible after the trade is concluded. Market participants are also able to defer publication of information until the end of the trading day for transactions in corporate bonds and mortgage bonds if the volume exceeds certain thresholds[15].

131. Finally, many trading venues (regulated markets and MTFs) trading non-equity instruments in jurisdictions with no legal framework governing post-trade transparency published some information on transactions executed on their platforms, and for large transactions with a deferral.

Use of deferrals

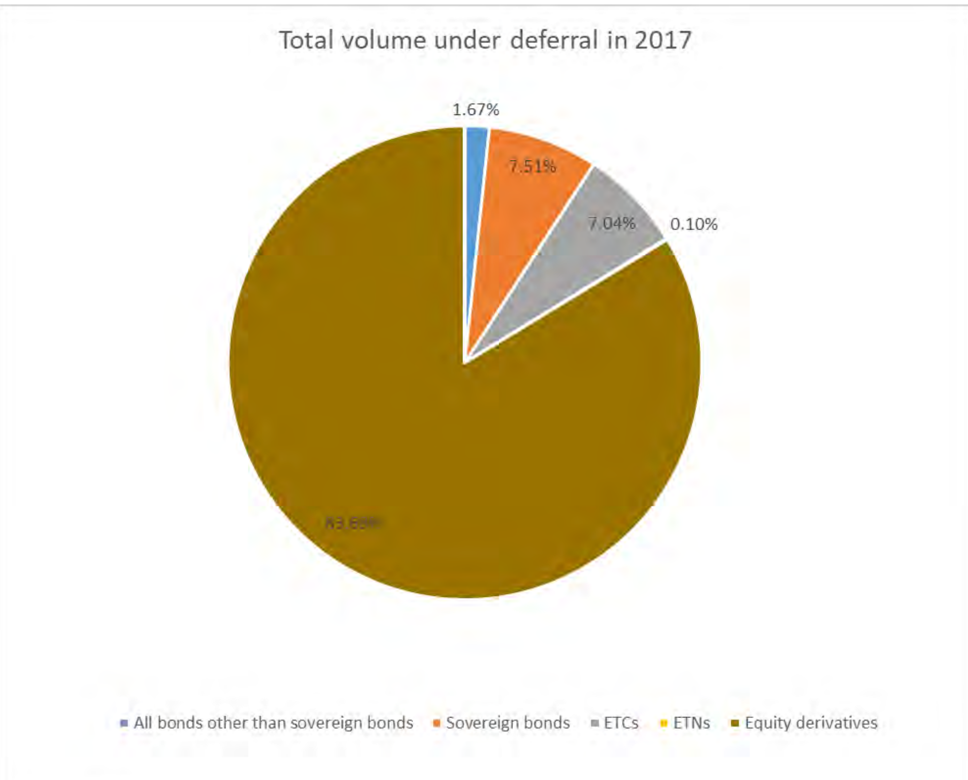
132. In order to compare the availability of post-trade transparency information before and after MiFID II/ MiFIR, ESMA performed a data collection across trading venues and APAs in order to gather trading activity data subject to a post-trade transparency regime applicable at national level in 2017 and subject to the MiFID II/ MiFIR post-trade transparency regime in 2018.

[15] See: http://www.nasdaqomxnordic.com/bonds/denmark/?languageId=1

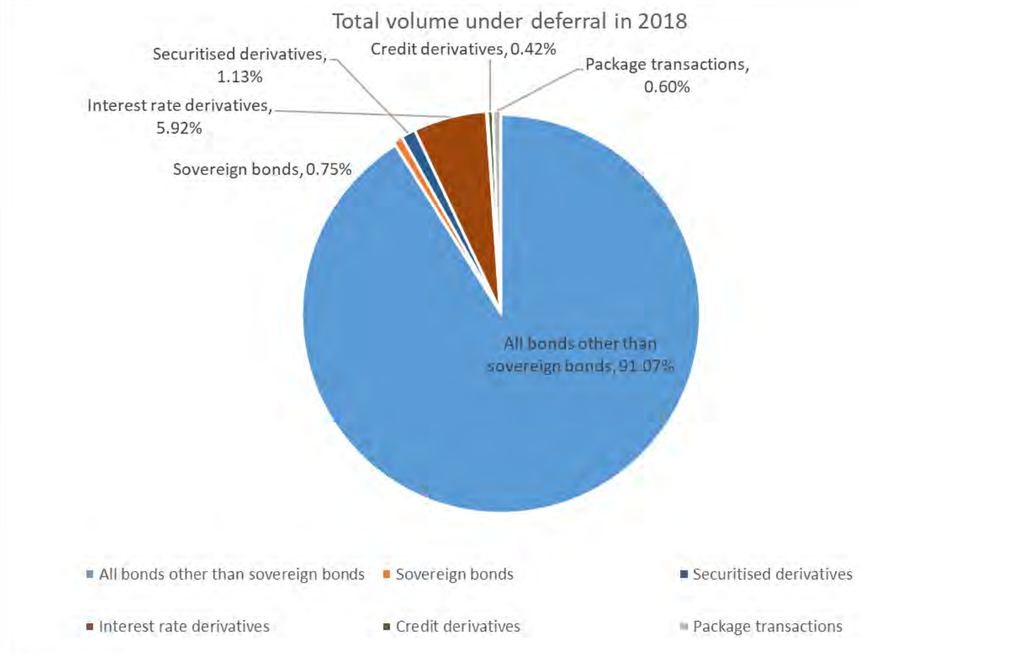
133. Figure 21 and Figure 22 show the use of deferrals per asset class in 2017, i.e. before MiFID II, and in 2018, including transactions executed on trading venues SIs and OTC. Concerning the notional amount volume traded in 2017 most transactions not subject to real-time post-trade transparency were executed in equity derivatives (84%), followed by sovereign and other types of bonds (10%) and ETCs (7%). The share of other asset classes was marginal. This can be attributed to the fact that many asset classes were either not subject to real-time transparency prior to MiFID II or pre-dominantly executed OTC (e.g. by brokers that are authorised as OTFs or MTFs under MiFID II).

134. When looking at the notional amount of transactions benefitting from a deferral in 2018, a major shift can be observed compared to 2017. In 2018, the large majority of transactions benefitting from a deferral in terms of notional trading volume are bonds, in particular bonds of type other than sovereign (91%%) and interest rate derivatives (5.9%). The share of transactions in other asset classes benefitting from a deferral in terms of notional amount is marginal.

FIGURE 21 TRADING NOTIONAL AMOUNT BENEFITTING FROM A DEFERRAL, 2017 (TOP) AND 2018(BOTTOM)



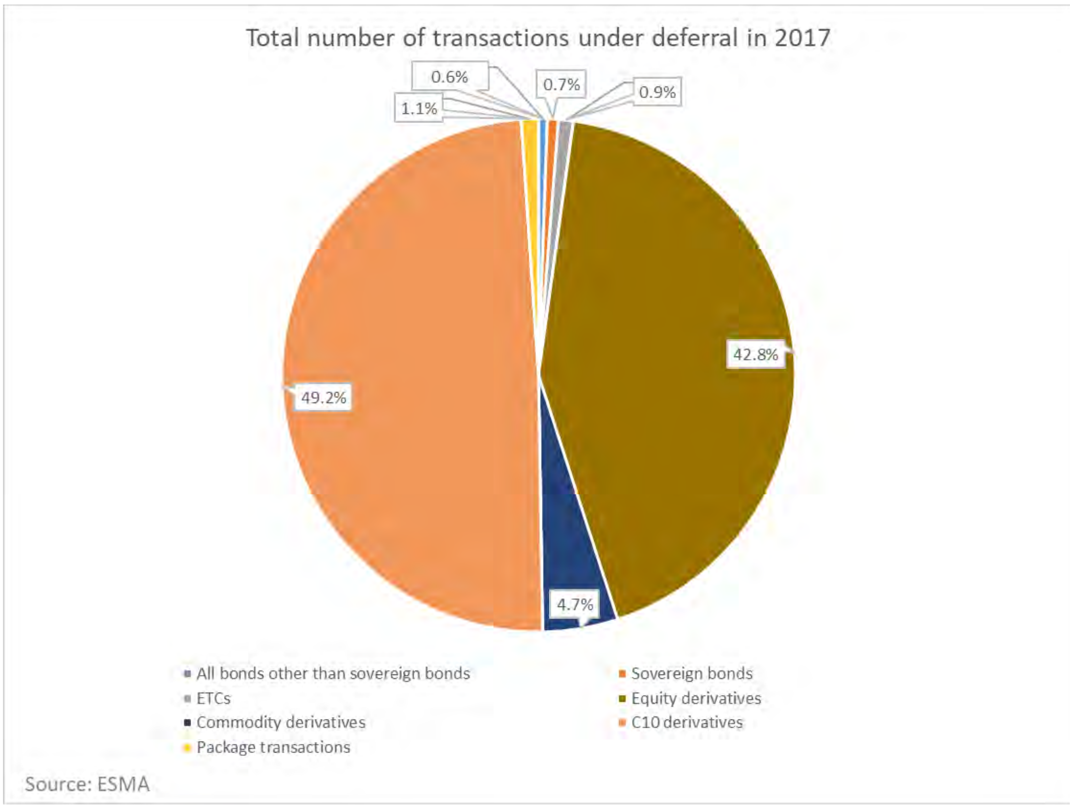
Source: ESMA

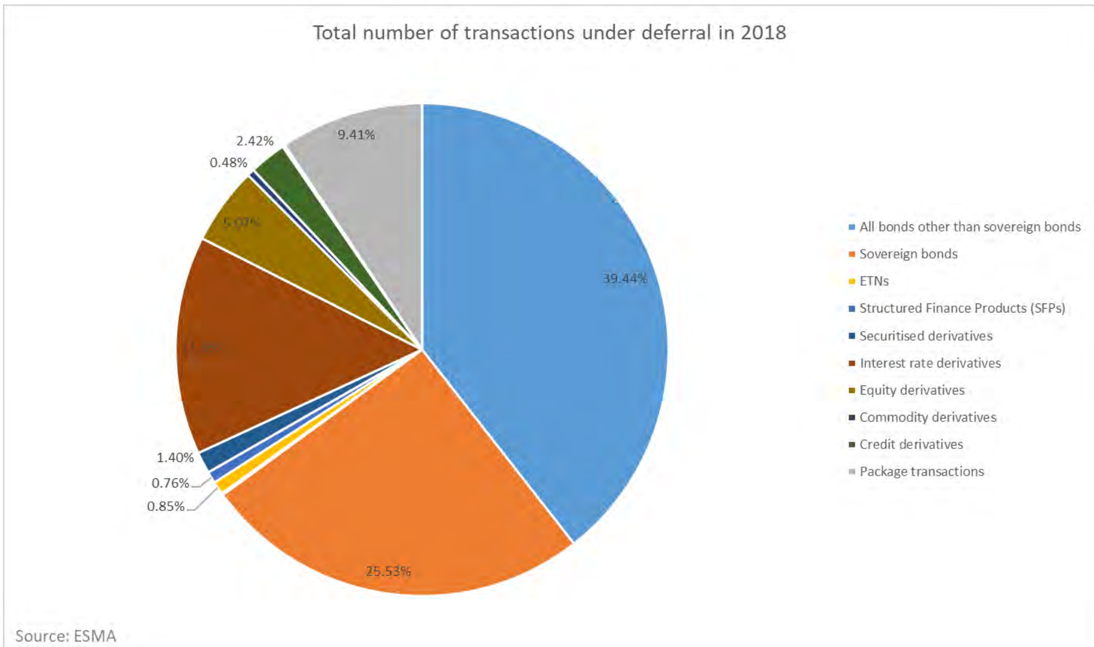


Source: ESMA

135. This change is also broadly reflected when comparing the number of transactions benefitting from deferred publication in 2017 and 2018 (see Figure 22 below), even though the use of deferrals is spread across more asset classes in terms of number of transactions compared to the notional amount of transactions. In 2018, most transactions benefitting from a deferral were bonds (sovereign bonds: 25.5%; all the other types of bonds: 39.4%), followed by interest rate derivatives (14.4%) and package transactions (9.4%).

FIGURE 22 NUMBER OF TRANSACTIONS BENEFITTING FROM A DEFERRAL, 2017 (TOP) AND 2018 (BOTTOM)

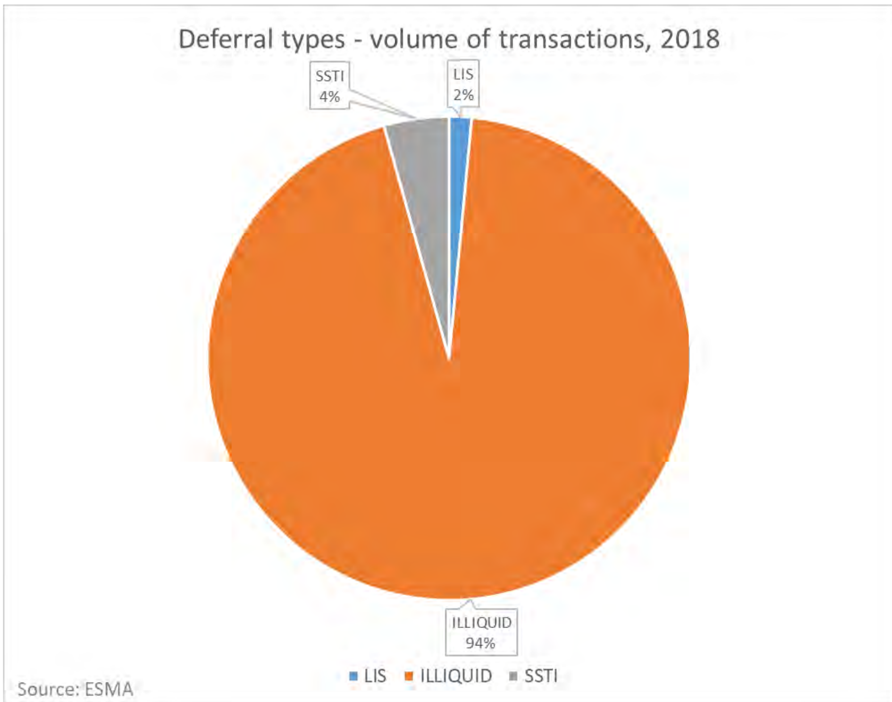




136. Figure 23 below shows the use of deferrals by types based on the notional trading volume of transactions concluded on trading venues in 2018. It can be observed that the ILQ deferral is by far the most used deferral type, covering 94% of notional trading volume. Furthermore, 4% of the trading notional trading volume under deferrals use the

SSTI deferral and the LIS deferral is used only for 2% of the trading volumes. It should be noted that transactions using the ILQ deferral may also conclude transactions that are above SSTI or LIS.

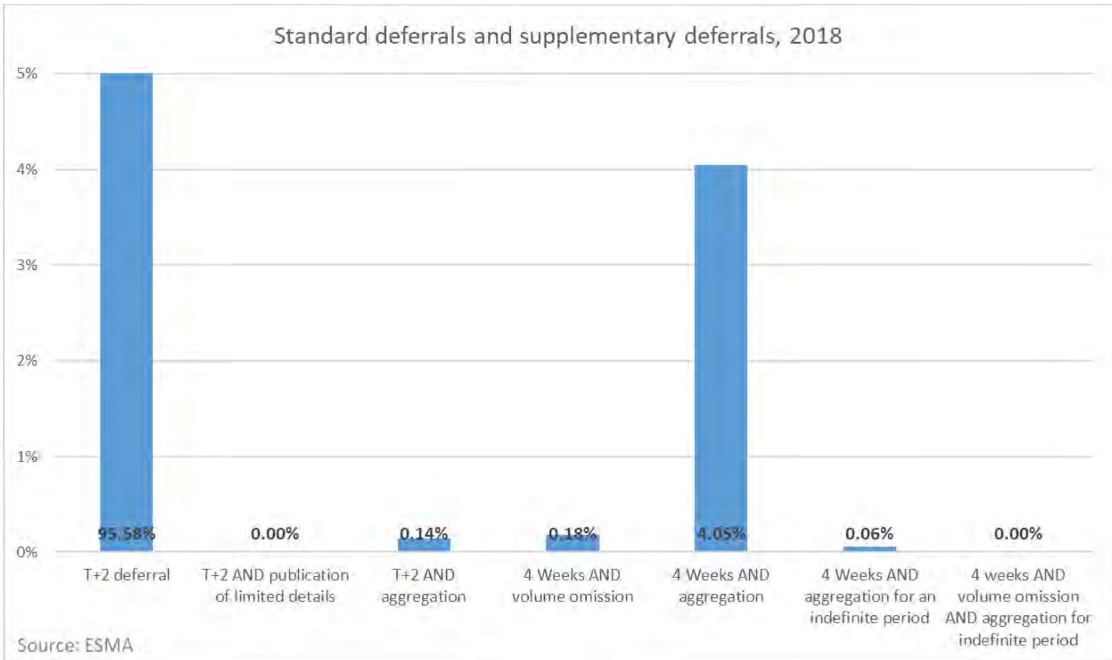
FIGURE 23 USE OF DIFFERENT DEFERRAL TYPES, BASED ON NOTIONAL TRADING VOLUME OF TRANSACTIONS IN 2018 BENEFITTING FROM A DEFERRAL



137. Most transactions in non-equity instruments (95.6% of notional amount trading volume) benefitting from deferred publication are published on T+2, i.e. using the standard deferral period (see Figure 24).

138. Concerning the supplementary deferrals, the possibility to publish transactions in aggregated form during a period of 4 weeks is also particularly used (4.1% of notional amount trading volume), whereas the trading volume for the other types of supplementary deferrals are marginal.

FIGURE 24 USE OF STANDARD AND SUPPLEMENTARY DEFERRALS ACROSS ALL NON-EQUITY INSTRUMENTS, NOTIONAL AMOUNT TRADING VOLUME, 2018

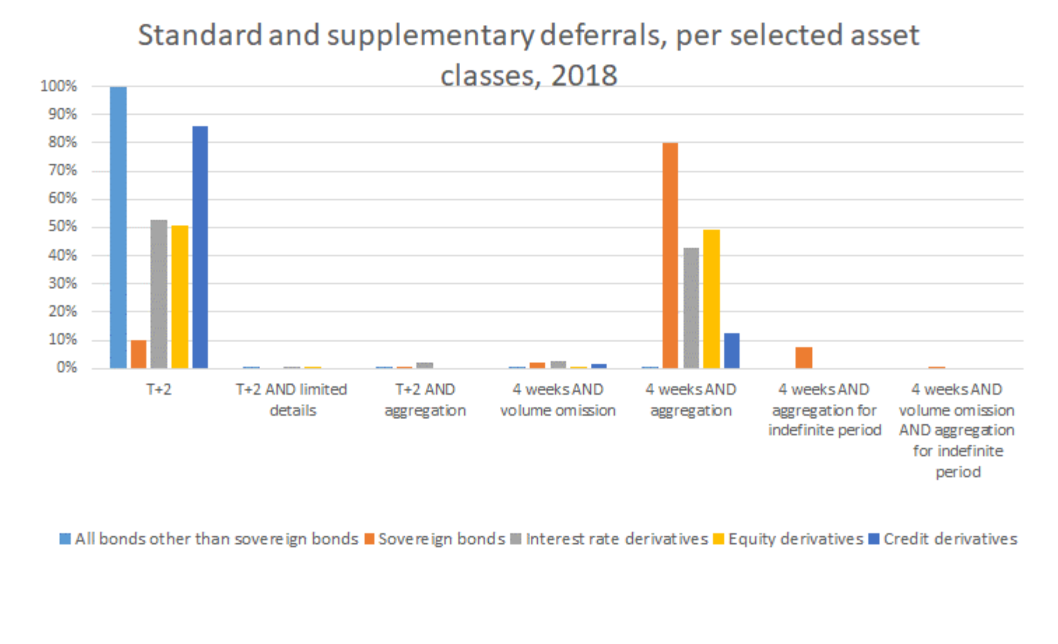


139. However, it can be noted that the deferrals are used differently across asset classes (Figure 25). For instance, while nearly all trading notional amount in bonds of type other than sovereign benefitting from a deferral is subject to the standard deferral period of 2 days, most sovereign bonds benefitting from a deferral use the option to aggregate transactions for a period of 4 weeks and/or indefinitely.

140. Moreover, it can be observed that about half of the trading volume in equity and interest derivatives benefitting from a deferral are published after 2 days (standard deferral) or after 4 weeks (supplementary deferrals, using the option to aggregate transactions during the 4 week deferral period).

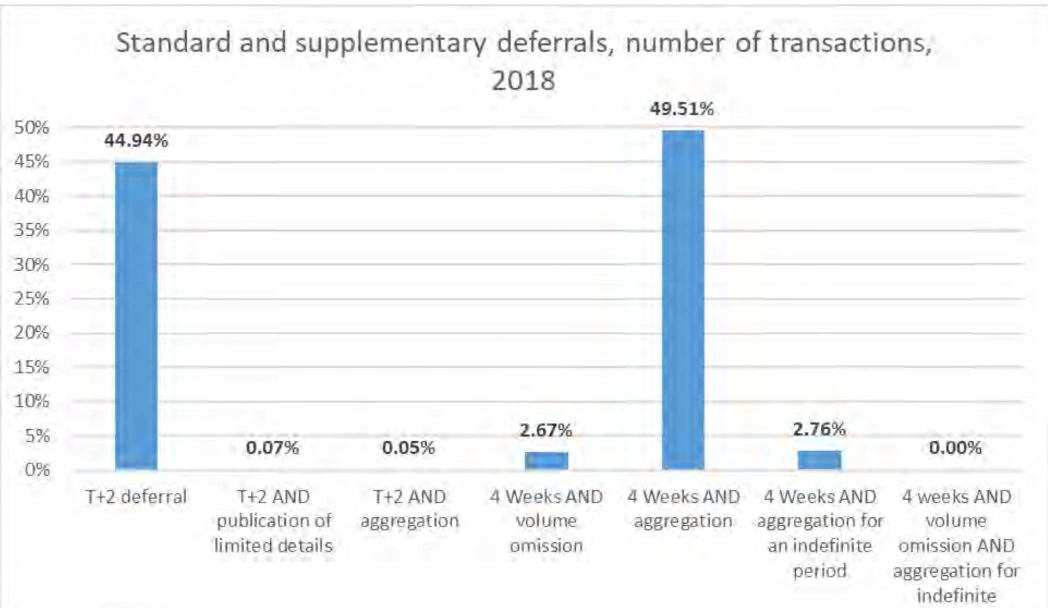
141. Concerning credit derivatives, about 85% of the notional amount traded benefitting from a deferral is published after 2 days, and the remaining 15% after 4 weeks (in most cases publishing aggregated transactions for 4 weeks).

FIGURE 25 USE OF STANDARD AND SUPPLEMENTARY DEFERRALS, SELECTED ASSET CLASSES, NOTIONAL AMOUNT, 2018



142. Looking at the use of the different deferrals based on the number of transactions (Figure 26) reveals a more equal split between the standard deferral of T+2 (45%) and the supplementary deferral of 4 weeks (55%). For the latter, as for the notional amount trading volume, most transactions benefit from the option to aggregate transactions for a period of 4 weeks (49.5%).

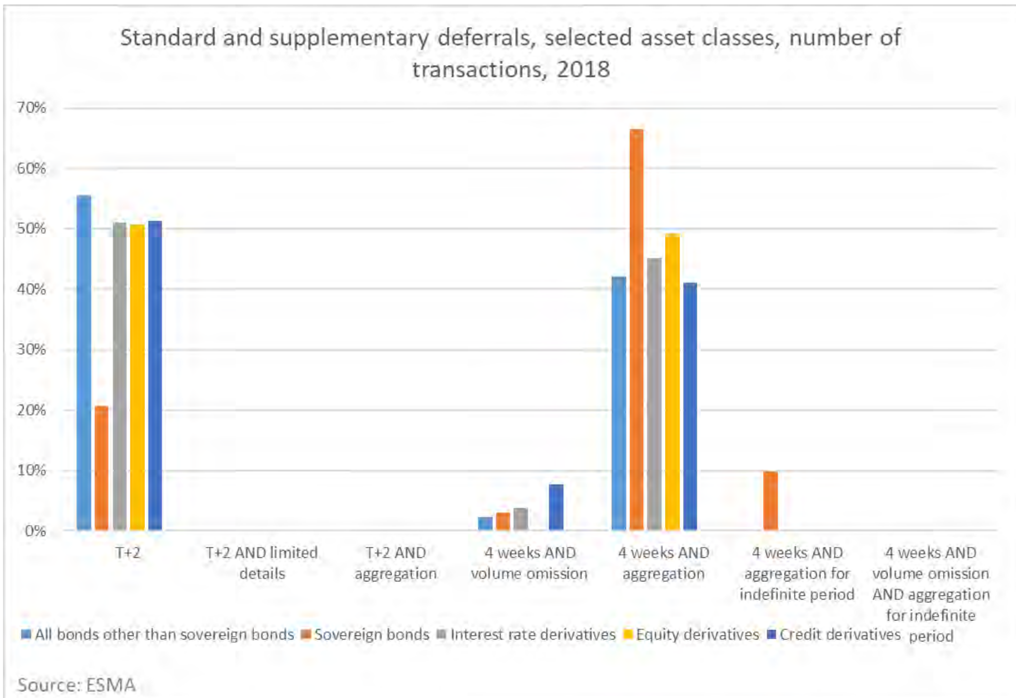
FIGURE 26 USE OF STANDARD AND SUPPLEMENTARY DEFERRALS, NUMBER OF TRANSACTIONS, 2018



Source: ESMA

143. This observation also holds true when looking at selected asset classes (Figure 27), where it can be observed that deferrals for most asset classes are broadly equally split between the T+2 and 4 weeks aggregated deferral. However, it can be noted that the use of deferrals is different for sovereign bonds, where 75% of transactions benefit either from a 4 week or indefinite deferral (while publishing aggregated transactions) and only about 25% of transactions from the T+2 deferral.

FIGURE 27 USE OF STANDARD AND SUPPLEMENTARY DEFERRALS, SELECTED ASSET CLASSES, NUMBER OF TRANSACTIONS, 2018



144. In conclusion, it can be said that the different use of deferrals between number of transactions and notional trading volume of transactions seems to indicate that many small transactions in illiquid instruments are published only after an extended period of deferral.

145. As set out in ESMA's Annual Report for 2018 on the application of waivers and deferrals[16] and in the table on deferrals published on ESMA's website[17], there are some common denominators in the way CAs have chosen to implement the rules on deferred publication, noting that there are also some exceptions. For transactions of potentially the same size in the same instrument, there are differences across the EU as to when post-trade information is expected to be made available.

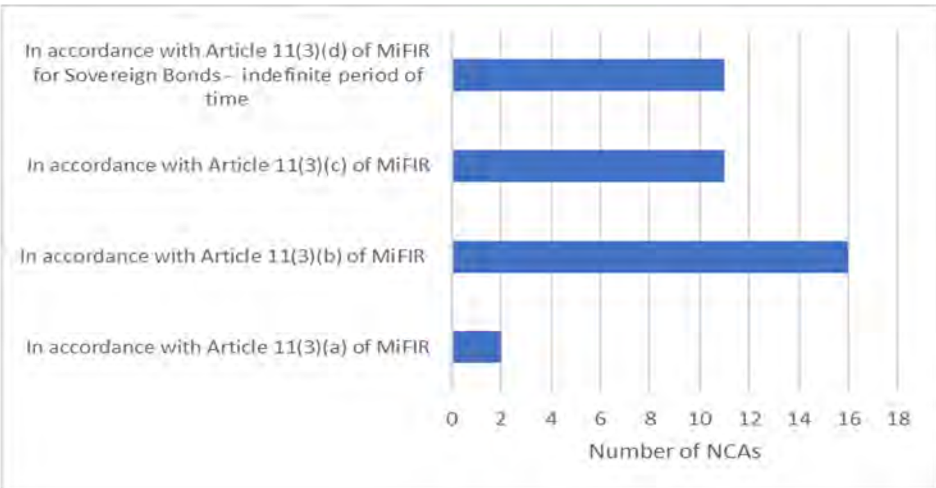
146. When the transaction takes place on a trading venue, the trading venue has to comply with the deferral regime applicable in the Member State where it is authorised. However, when a member of that trading venue would be trading the same financial instrument

[16] https://www.esma.europa.eu/sites/default/files/library/esma70-156-1010_annual_report_2019_waivers_and_deferrals.pdf
[17] https://www.esma.europa.eu/sites/default/files/library/esma70-156-173_deferred_publication_requirements.xlsx

OTC, the applicable deferral regime is that in place in the Member State where the investment firm in charge of post-trade publication is located. This is a source of complexity and a source of errors for market participants, particularly for APAs to which investment firms often outsource compliance with the timing and content of post-trade publication.

147. ESMA's annual report on the use of waivers and deferrals revealed that 21 out of 31 CAs allow the deferred publication of OTC-transactions. However, investment firms in only 12 of these 21 jurisdictions are making use of this possibility. Concerning, the possibility of supplementary deferrals, many CAs opted for the most flexible approach, i.e. allowing an extended deferral period of 4 weeks during which transactions can be either aggregated or the volume omitted (see Figure 28). Only two CAs (Portugal and Sweden) required the publication of additional information during the standard deferral period of T+2.

FIGURE 28 AUTHORISATION OF SUPPLEMENTARY DEFERRALS



148. Furthermore, as discussed above, concerns have been expressed by some market participants and CAs about a disappointing level of post-trade transparency in non-equity instruments under MiFID II. ESMA appreciates that there may be various factors contributing to this outcome, such as the definition of ToTV (see Section 3.2.2.3) or the phased-in approach to bond market liquidity (see Section 4.1.2).

B. Conclusions and Proposals

149. In summary, ESMA's preliminary assessment of the level of post-trade transparency points to the following:

150. The overall level of real-time post-trade transparency appears to be very limited.

151. Most transactions published with a deferral belong to the asset class of bonds (sovereign bonds and other bonds). The vast majority of transactions using a deferral are for illiquid instruments.

152. A difference in the use of deferrals can be observed when comparing the number of transactions to the notional amount trading volume of transactions. In terms of notional amount trading volume, most transactions published with a deferral (with the exception of sovereign bonds) are published after 2 days, i.e. the standard deferral period. However, in terms of number of transactions published with a deferral, about half of the transactions are only made fully post-trade transparent after an extended period of 4 weeks. This points to the somewhat counterintuitive conclusion that in particular small transactions (in illiquid instruments) benefit from the supplementary deferrals.

153. While many CAs make use of the supplementary deferrals, it can be observed that in practice nearly all transactions using the supplementary deferrals use the option of publishing aggregated transactions during the 4-week deferral period (or for an indefinite period for sovereign bonds). The use of the other options is only marginal. Although most CAs have been focussing on the same options, the diversity of available deferral options enshrined in the Level 1 text does not appear to have delivered on the objective of improving the functioning of the EU internal market by establishing uniform requirements for the transparency of transactions in financial instruments and by providing less regulatory complexity for market participants.

154. Whist MiFID II/MiFIR aimed at providing an updated harmonised legal framework to enhance the efficiency, resilience and integrity of financial markets notably by achieving greater transparency for non-equity instruments, it is unclear that this objective has been achieved. Based on the above assessment, ESMA considers that more real time post-trade transparency information should be made available across asset classes to enhance competition among market participants, reduce asymmetries of information and deliver high quality information for market users. However, ESMA also notes that such benefit would only be delivered through more uniform rules further supporting the EU single market. Proposals are set out below to that end.

Q10: Do you agree with ESMA's assessment of the level of post-trade transparency and with the need of a more streamlined and uniform post-trade regime which does not include options at the discretion of the different jurisdictions? If not, please explain why and, where available, support your assessment with data.

155. As a first step, ESMA recommends, similarly to the proposal for pre-trade transparency, to delete the concept of SSTI for the deferral regime. This proposal aims at delivering a simple post-trade transparency regime resulting in more transparency and more clarity for market participants. However, ESMA is aware that also on the post-trade side the deletion of the SSTI might make other deferrals, such as the LIS more relevant, especially considering that the SSTI is applicable only to certain transactions, i.e. those executed between an investment firm dealing on own account other than on a matched principal basis and another counterparty. The LIS threshold can be applied to all transactions thus the benefits of the deletion in terms of post-trade transparency might be put into question. Similar as for the pre-trade SSTI, ESMA suggests compensating for the deletion of the SSTI-deferral by lowering the post-trade LIS threshold, possibly to different levels depending on the asset class. Such a proposal would require a change of the Level 1 text

(deletion of SSTI-deferral) and of the level 2 text (recalibration of the post-trade LIS threshold).

156. In consequence of deleting the SSTI-deferral, ESMA suggests also to delete the SSTI package deferral as provided in RTS 2.

Q11: Do you agree with this proposal? What would be the appropriate level of such a revised LIS-threshold in your view?

157. To address the concerns identified ESMA further proposes to remove the discretionary regime for post-trade deferrals to the benefit of one single regime. ESMA considers that the current regime led to a patchwork of rules applying across the Union which is difficult to understand and to apply for market participants. ESMA agrees with the comments made by many stakeholders that a four-week delay for the publication of a transaction provides information to market participants which is of limited use.

158. ESMA is proposing to create a single regime which has the potential to reduce unnecessary complexity, remove barriers to trade in the Union and create an adequate level playing field for post-trade transparency.

159. The new regime would seek to enhance available post-trade transparency in non-equity instruments with three main options being considered below.

Option 1 Volume masking for transactions in illiquid instruments and for large transactions

- Post-trade information of transactions in illiquid instruments and above the large-in-scale threshold would be published as close to real time as possible with the volume being masked.

- The volume of the transactions is then published after a certain period of time following the transaction, such as two calendar weeks.

Option 2 Volume masking only for large transactions

- Post-trade information for transactions above the large-in-scale threshold would be published as close to real time as possible with the volume being masked. Transactions in illiquid instruments would be published in real time.

- The volume of the large-in-scale transactions is then published after a certain period of time following the transaction, such as two calendar weeks.

- This option would require the deletion of the deferral for illiquid instruments which would be in line with the regime currently in place in the US.

- However, in contrast to the US regime where the transaction details of block size transactions are never made public, all the details of volume masking transactions would be published after a certain period of time, such as two calendar weeks.

Option 3 Volume masking for large trades for two days and extended volume masking for very large trades

- As in Option 2, post-trade information for transactions above the large-in-scale thresholds would be published as close to real time as possible with the volume being masked.
- The volume of the large-in-scale transactions is then published after two days.
- For very large transactions, such as those 5 times the large-in-scale threshold, would be published after a certain period of time, such as four calendar weeks.

160. ESMA is aware that the amendments to the post-trade deferral regime under all three options represent a significant change that the deletion of the deferral for transactions in illiquid instruments suggested under Options 2 and 3 will be met with concerns of having detrimental effects on, for instance, liquidity providers. In particular, because more frequent episodes of illiquid markets where market participants are unable/unwilling to facilitate transfer of risk would be expected.

161. At the same time the ESMA proposal would align MiFIR more closely with the US regime. In order to find the proper balance between the potential negative impacts and benefits of the proposal, ESMA is seeking stakeholder views on the best way forward. ESMA is therefore looking for concrete input backed up by data analysis what specific concerns stakeholders may have and how they can be addressed in MiFIR while arriving at a future regime which provides a genuine alignment of rules thereby creating a level-playing field.

162. Figure 29 below summarises the differences under the three options.

FIGURE 29 OPTIONS FOR SUPPLEMENTARY DEFERRALS

	Real-time publication of all transactions with volume masking for some transactions	Deferred publication of volume for transactions			
		In Illiquid instruments	above LIS		Above Extra-LIS after a certain period of time
			t+2	after a certain period of time	
Option 1	Yes	Yes	No	Yes	No
Option 2	Yes	No	No	Yes	No
Option 3	Yes	No	Yes	No	Yes

163. In none of the options above would a further delay or specific treatment be applied to sovereign debt instruments. In that regard, ESMA notes that some Nordic countries (Finland, Sweden, Denmark, Latvia) do not allow for supplementary deferral under Article 11(3)(b) (omission of the publication of the volume of an individual transaction) and Article 11(3)(d) (publication of several transactions in an aggregated form for an indefinite period of time) for sovereign debt instruments. ESMA is not aware that the liquidity of the sovereign bond market in those Member States have been negatively impact by the decision taken by the relevant CAs[18]. On the contrary, market participants in those countries ask for and voluntarily apply a more stringent set of transparency rules.

164. The more streamlined harmonised approach suggested above would also have the benefit of reducing the complexity and source of errors identified in paragraph 142 with regards to the Member State applicable deferral regime.

Q12: In your view, should the real time publication of volume masking transactions apply to transactions in illiquid instruments and above LIS waiver (Option 1) or to transactions above LIS only (Option 2 and Option 3). Please elaborate. If you support another alternative, please explain which one and why.

Q13: Do you agree with the publication of the price and volume of all transactions after a certain period of time, such as two calendar weeks (Option 1 and 2) or do you support the two-steps approach for LIS transactions (Option 3)? Please explain why and provide any alternative you would support. Which is the optimal option in case a consolidated tape would emerge in the future?

3.2.2.2 Assessment of the quality of post-trade transparency information

A. Analysis

165. Trading venues and investment firms (via APAs) are subject to the requirement to make transactions post-trade transparent in real time, unless being authorised to publish the information with a deferral. The detailed fields to be made public by trading venues (regulated markets, MTFs, OTFs) and APAs as well as the list of flags are specified in Annex II of RTS 2. Currently, Article 7(4) of RTS 2 requires post-trade information to be made public within 15 minutes after the transaction has been executed. As of 3 January 2021, this period will be reduced to 5 minutes (Article 7(4)(b) of RTS 2).

166. As for pre-trade transparency, trading venues and APAs are required to make real-time pre-trade data available on a RCB and free of charge 15 minutes after publication. ESMA's assessment on the quality of post-trade information relies mainly on the delayed

[18] See also section 3.2.2.1.

information provided free of charge. As highlighted in the recent review report on the cost of market data and the equity consolidated tape (CT)[19] and also in section 3.1.2.5 not all trading venues and APAs are currently (fully) complying with the requirement to make data available free of charge 15 minutes after publication. This limited the analysis on post-trade data that ESMA could perform for this CP.

167. Nevertheless, on a high-level the following observations can be made. Firstly, as presented in the previous section, many transactions are only published with a deferral of 2 days or 4 weeks. While such deferrals protect liquidity providers from market risk and allow the hedging of positions, they significantly undermine the value of available post-trade data since post-trade transparency is only provided with a delay of 2 days or 4 weeks or, for sovereign bonds, is never fully provided (see from Figure 24 to Figure 27).

168. Secondly, the number of trading venues and APAs publishing post-trade data is very high (279 entities reported non-equity data to FITRS in 2018, 156 entities for the EU27), resulting in a dispersion of post-trade information across many entities and making it challenging for market participants to obtain a consolidated view (see Table 1). To date no CT for non-equity instruments has emerged.

169. This observation was also confirmed by the FI study on the Swedish bond market, where market participants considered that the information is published in a fragmented manner and is not always easily accessible, thereby making it challenging to get a full picture of transactions executed.

19 https://www.esma.europa.eu/sites/default/files/library/mifid_ii_mifir_review_report_no_1_on_prices_for_market_data_and_the_equity_ct.pdf

Table 1 Number of trading venues and APAs non-equity per country

COUNTRY CODE	COUNTRY	RMs	MTFs	OTFs	APAs
AT	AUSTRIA	2	1	-	1
BE	BELGIUM	2	5	-	-
BG	BULGARIA	2	1	-	1
CY	CYPRUS	1	1	-	-
CZ	CZECH REPUBLIC	2	2	1	-
DE	GERMANY	16	15	2	1
DK	DENMARK	1	1	-	-
EE	ESTONIA	1	1	-	-
ES	SPAIN	9	2	4	1
FI	FINLAND	1	1	-	-
FR	FRANCE	3	5	6	1
GB	UNITED KINGDOM	8	75	35	6
GR	GREECE	3	1	-	1
HR	CROATIA	1	-	-	1
HU	HUNGARY	2	-	-	-
IE	IRELAND	1	3	1	-
IS	ICELAND	1	1	-	-
IT	ITALY	7	10	-	-
LI	LIECHTENSTEIN	-	-	-	-
LT	LITHUANIA	1	1	-	-
LU	LUXEMBOURG	1	1	-	-
LV	LATVIA	1	1	-	-
MT	MALTA	2	1	-	-
NL	NETHERLANDS	6	11	1	5
NO	NORWAY	7	1	-	1
PL	POLAND	-	-	-	-
PT	PORTUGAL	3	1	-	-
RO	ROMANIA	1	1	-	-
SE	SWEDEN	9	3	-	1
SI	SLOVENIA	1	1	-	-
SK	SLOVAK REPUBLIC	1	-	-	-
		96	147	50	20

(*) The table includes trading venues and APAs (in terms of segment MICs) that reported quantitative data reports related to the trading activity of non-equity instruments to FITRS over the period Jan 2018-Dec 2019. Data related to instruments terminated in 2018 or in 2019 is excluded.

(**) The number of Polish venues and APAs is zero because Poland is a non-delegating country, i.e. an NCA who has not signed a Delegation Agreement with ESMA on the Instruments Reference Data Project

Source: FITRS

170. From Table 2 below it can be seen that the trading in non-equity instruments is mainly executed OTC, with nearly 90% of notional amount reported to FITRS by APAs.

TABLE 2 TOP 15 REPORTING ENTITIES NON-EQUITY

TRADING VENUE/ APA NAME	OPERATING MIC	ENTITY TYPE	NCA OF THE TRADING VENUE/ APA	MARKET SHARE
TRADEWEB EUROPE	TREA	APA	GB	54.82%
LONDON STOCK EXCHANGE	ECHO	APA	GB	17.85%
CREDITEX BROKERAGE - ICE	IFEU	TV	GB	9.35%
ABIDE FINANCIAL	AFDL	APA	GB	5.25%
NEX SEF	NEXS	TV	GB	4.62%
BGC BROKERS LP - TRAYPORT	BGCI	TV	GB	2.61%
BROKERTEC EUROPE	BTEE	TV	GB	0.94%
XTRAKTER	TRAX	APA	GB	0.77%
REFINITIV TRANSACTIONS SERVICES LIMITED	RTSL	TV	GB	0.52%
BLOOMBERG	BMTF	TV	GB	0.37%
TULLETT PREBON EUROPE	TPEL	TV	GB	0.30%
EBS MTF	EBSN	TV	NL	0.24%
EUREX DEUTSCHLAND	XEUR	TV	DE	0.21%
ELIXIUM	TRDE	TV	GB	0.20%
GFI SECURITIES LTD	GFIC	TV	GB	0.19%

Source: FITRS

(*) The table includes trading venues and APAs that reported quantitative data reports related to the trading activity of non-equity instruments to FITRS over the period Jan 2018 - Dec 2019. Data related to instruments terminated in 2018 or 2019 is excluded.

171. Thirdly, the value of available post-trade data, both for real-time as well as for deferred data, is significantly undermined due to data quality issues. This is in particular the case for OTC-transactions. The issues identified by ESMA, and including feedback received from stakeholders, include:

- Inconsistent reference data (e.g. equity instruments reported as non-equity instruments and vice versa, inconsistent classification of non-equity instruments);
- Many derivatives are currently out of scope of the transparency requirements (see section 3.2.2.3).
- Missing attributes for trades as specified in table 1 and 2 of Annex II of RTS 2 (e.g. transaction time, ISIN, price, …);
- Publication of erroneous information (e.g. incorrect/implausible price or quantity, implausible transaction times, inconsistencies between time of publication and time of transaction);
- Duplicative and/or missing trade reports for OTC transactions;

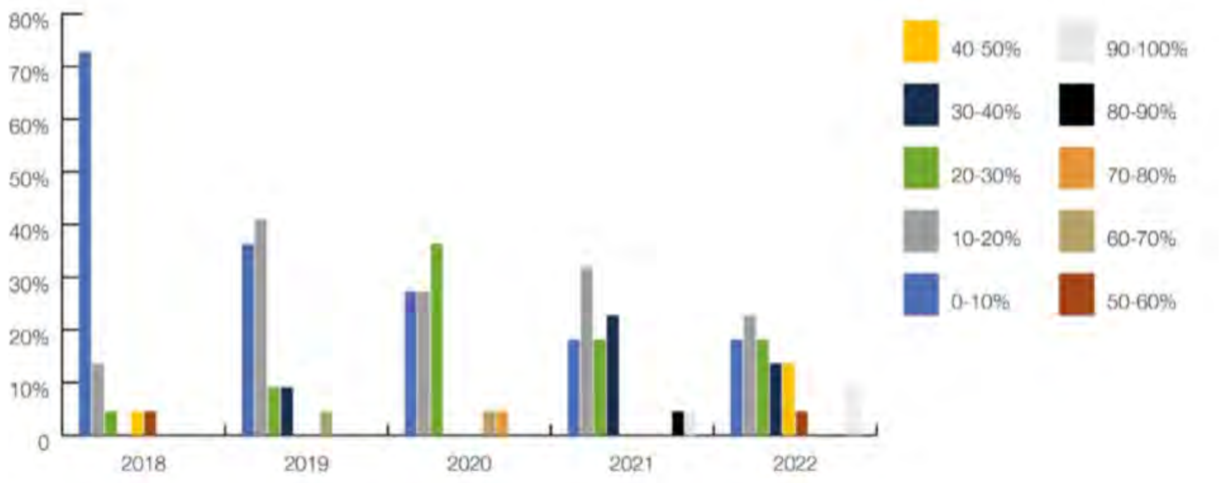
- Inconsistent use of flags for the purpose of post-trade transparency as specified in Table 3 of Annex II of RTS 2 (e.g. inconsistent use of the cancellation and amendment flags, inconsistent use of the flags for supplementary deferrals); and

- Late publication of trade reports not benefiting from a deferral or after the lapse of the deferral (i.e. not in real-time and at times later than 15 minutes after the execution of the transaction).

172. The FI study highlighted inconsistencies in the volume of OTC transactions reported and considered that the post-trade information currently published by APAs is only partial.

173. The limited usability of the current transparency information provided is largely confirmed by the ICMA study assessing the impact of the MiFID II transparency provisions on bonds, which concludes that currently a large part of transparency information is not usable (Figure 30).

FIGURE 30 PERCENTAGE OF USABLE TRADE DATA (PRE- AND POST-TRADE TRANSPARENCY)



Source: ICMA

B. Conclusions and Proposals

174. The following can be concluded from the analysis above:

- (Delayed) post-trade information is difficult to find and/or frequently accessible only with restrictions;[20]

- Given the long deferral period, in particular where the 4-week deferral period is used, currently the value of most post-trade information is limited and often outdated;

[20] See also the analysis in section 3.1.2.5.

- The usability of the data is further limited due to the fragmented reporting environment with currently more than 279 trading venues and APAs operating;
- The current fragmented and complex reporting environment also hinders a CTP from emerging due to the high costs of implementing the different rules necessary for a proper aggregation of data under the different post-trade transparency regimes across jurisdictions; and
- The value of the data is significantly undermined by data quality issues.

175. Concerning the first issue, as already set out in the MiFID review report on the cost of market data, ESMA will follow up, in close cooperation with CAs, on the compliance of trading venues and APAs with the obligation to provide market data free of charge 15 minutes after publication.

176. Concerning the deferral period, ESMA is making some proposals on the possible way forward in section 3.2.2.1.

177. Concerning data quality issues, ESMA considers that the current specification in Level 2 is sufficiently clear, and that data quality could be improved by a stronger focus on enforcement of the current provisions by CAs. Furthermore, ESMA considers issuing in some areas further supervisory guidance. Finally, ESMA considers a change to the L1 to broaden the scope of derivatives subject to the transparency requirements (see section 3.2.2.3).

Q14: Do you agree with ESMA's proposed way forward to issue further guidance and put a stronger focus on enforcement to improve the quality of post-trade data? Are there any other measures necessary at the legislative level to improve the quality of post-trade data? What changes to the transparency regime in Level 1 could lead to a substantial improvement of data quality?

Q15: What would be the optimal transparency regime to help with the potential creation of a CTP?

3.2.2.3 Assessment of the concept of traded on a trading venue (TOTV)

A. Analysis

178. The concept of 'traded on a trading venue (TOTV) applies to a number of provisions in MiFID II and MiFIR, and in particular the pre- and post-trade transparency requirements for trading venues and investment firms (including SIs) trading OTC, the obligations to report transaction data and the requirement to submit reference data. MiFIR does not provide for a definition of TOTV.

179. While the concept of TOTV applies also to pre-trade transparency, there is no ambiguity on its application by trading venues. The concept of TOTV is also of relevance for the SI-quoting obligations. However, given the currently limited number of liquid instruments,

most quotes provided by SIs are currently not subject to pre-trade transparency requirements. The concept of TOTV is of high relevance on the post-trade side, where only SI and OTC-transactions in TOTV instruments are subject to post-trade transparency requirements. Furthermore, transactions in TOTV instruments are subject to transaction reporting requirements.

180. It should be noted that the scope of transaction reporting is currently broader than the scope of post-trade transparency since in addition to TOTV instruments, financial instruments, where the underlying is TOTV or where the underlying is an index or a basket composed of TOTV instruments are subject to transaction reporting when traded OTC but not to the transparency requirements.

181. The concept of TOTV is straight forward for financial instruments traded on trading venues – every instrument traded on a trading venue is by definition TOTV and therefore subject to MiFID II/MiFIR and more specifically the rules on trade and transaction reporting.

182. Furthermore, the concept of TOTV is clear for OTC-transactions in instruments that are securities or that are centrally issued and fully standardised (e.g. shares and bonds). Whenever a security or centrally issued instrument (e.g. a bond) is available for trading on a trading venue, OTC-transactions in the same instrument (i.e. the same bond) are TOTV and subject to the MiFID II/MiFIR transparency and transaction reporting requirements.

183. It is however more challenging to specify the scope of TOTV for derivatives. While derivatives traded on regulated markets, MTFs or OTFs are TOTV, the TOTV status of contracts traded OTC but sharing a number or many characteristics with those contracts traded on MTFs or OTFs is unclear.

184. In May 2017 ESMA issued an opinion[21] further specifying the concept of TOTV for OTC-derivatives in order to delineate OTC derivatives that are within the scope of MiFIR and therefore subject to the transparency and transaction reporting requirements from those OTC derivatives that are not considered TOTV and in consequence outside the scope of those requirements.

185. The ESMA opinion is based on a narrow interpretation of the concept of TOTV by clarifying that only OTC derivatives sharing the same reference data details as the derivatives traded on a trading venue should be considered TOTV and, hence, subject to the MiFIR transparency and transaction reporting requirements.

186. The notion of "same reference data details" should be understood as the OTC-derivatives sharing the same values as the ones reported to the Financial Instruments Reference Data System (FIRDS) in accordance with the fields of Regulation (EU) 2017/585 (RTS 23) for derivatives admitted to trading or traded on a trading venue, except

[21] ESMA Opinion OTC derivatives traded on a trading venue (ESMA70-156-117), 22 May 2017, accessible at: https://www.esma.europa.eu/sites/default/files/library/esma70-156-117_mifir_opinion_on_totv.pdf

for fields 5 to 12 (the trading venue and issuer-related fields). Hence, OTC-derivatives not sharing the same reference data as instruments reported to FIRDS, for instance the ISIN, would not be considered TOTV.

187. ESMA opted for this narrow interpretation since, at the time, it was perceived as the best approach to ensure the consistent interpretation of the concept of TOTV across the different provisions of MiFIR and contribute to supervisory convergence in the Union. It was also considered as the most pragmatic way to get the MiFID II transparency and transaction reporting regime up and running, given the reduced IT complexity of this approach.

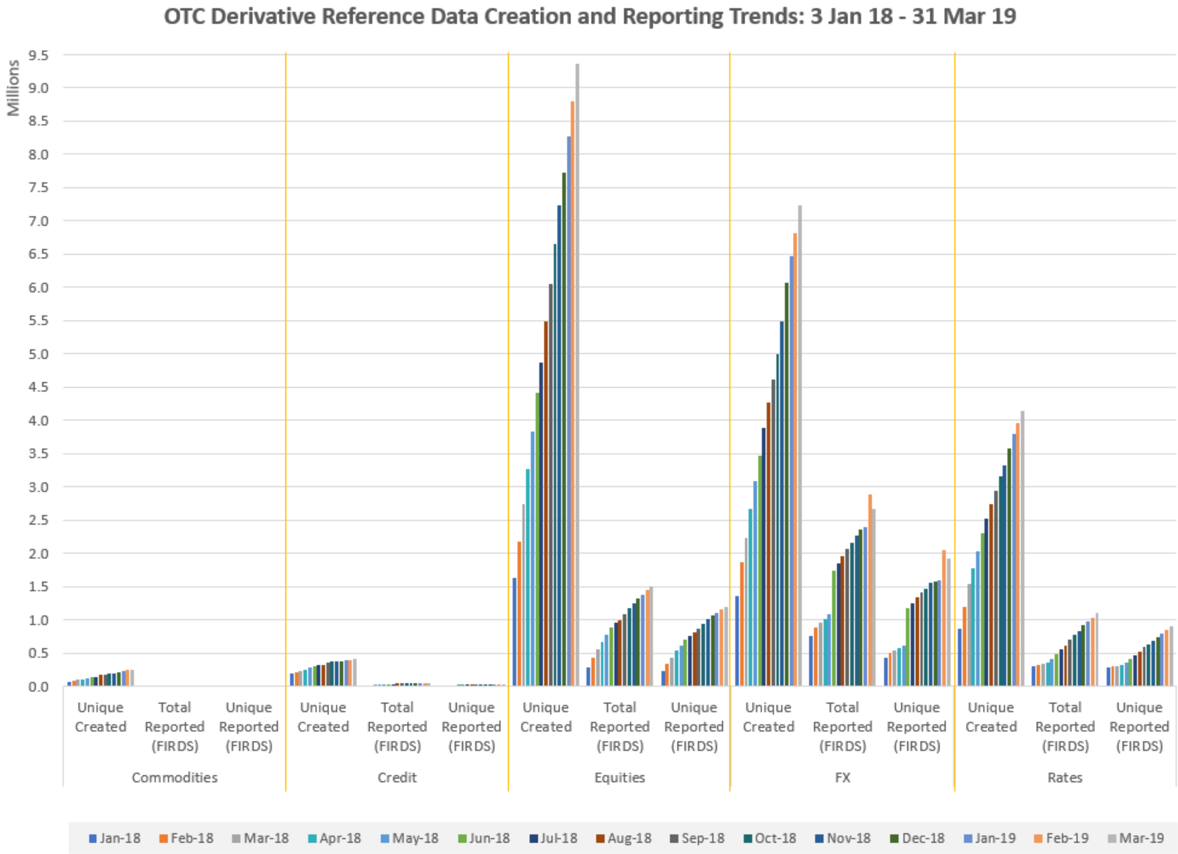
188. Nevertheless, ESMA was aware that this narrow interpretation significantly reduces the scope of OTC-derivatives considered to be TOTV. Therefore, ESMA committed to monitor market developments to ensure that this interpretation of TOTV does not undermine market transparency and efficiency, does not result in information asymmetries between market participants and does not create incentives to move trading to the OTC space as this would run counter to the legislative goals expressed in MiFID II/MiFIR.

189. Following the issuance of the opinion, ESMA received mixed feedback from stakeholders. While some stakeholders embraced the interpretation as being pragmatic and providing legal certainty, other stakeholders expressed strong concerns that the interpretation was too narrow and therefore exempted too many OTC-derivatives from the scope.

190. While it is difficult to specify the percentage of OTC-derivatives currently not considered TOTV, and hence not subject to transaction reporting and transparency, an analysis carried out by ANNA DSB reveals that a low share of ISINs created for OTC-derivatives is currently reported to FIRDS.

191. Figure 31 shows the relation between the number of ISINs generated by ANNA DSB (Uniquely Created) and reporting of those ISINs to FIRDS, distinguishing between ISINs reported by only one entity (Uniquely Reported (FIRDS)) and ISINs reported by multiple parties (Total reported (FIRDS)) across asset classes and covering the time period January 2018 to March 2019.

FIGURE 31 ISIN GENERATION FOR OTC-DERIVATIVES AND REPORTING TO FIRDS



Source: ANNA-DSB: FIRDS Analysis for March 2019; https://www.anna-dsb.com/2019/04/23/firds-analysis-for-march-2019/

192. The following observations can be made:

- The number of ISINs generated has been constantly increasing as has the reporting of ISINs to FIRDS;

- There is a large gap between the ISIN creation and the reporting of those ISINs to FIRDS across all asset classes. The gap is particularly high for equity derivatives (about 1 out of 9 ISINs generated is reported to FIRDS) and for commodity derivatives and credit derivatives, where barely any ISINs are reported to FIRDS. Currently (as of March 2019) about a quarter of ISINs generated for FX derivatives and interest rate swaps are ultimately reported to FIRDS;

- Most ISINs across asset classes are used and reported by one party (since the numbers on unique reporting are nearly at the same level as total reporting). This is somewhat different for FX derivatives where more ISINs appear to be reported by multiple parties. Overall, this seems to indicate that most contracts are assigned a new ISIN and that ISINs are not shared across venues or SIs.

193. This analysis seems to confirm the concerns expressed by various stakeholders that currently only few OTC-derivatives are TOTV.

194. Furthermore, it should be noted that not all investment firms trading OTC-derivatives are currently registered as users to ANNA DSB with the right to create ISINs. It is therefore possible that the numbers of ANNA DSB underestimate the share of OTC-derivatives currently not considered TOTV. At the same time, not all ISINs created by ANNA DSB necessarily result in an order or trade but may at times only be generated by trading venues and/or SIs to stand ready to offer such a contract should there be demand for it. Furthermore, it appears that sometimes users create different ISINs for instruments that are actually the same, thereby inflating the numbers. Hence, this might indicate that the share of OTC-derivatives considered not TOTV might be lower than the number above indicates.

B. Conclusions and Proposals

195. Based on the analysis carried out above, ESMA considers that the status quo results in exempting many OTC-derivatives from the MiFIR transparency and transaction reporting requirements.

196. MiFID II has the explicit objective to increase the level of transparency, including for OTC-transactions and market participants are only able to get a complete overview of the market if they are able to see on-venue and off-venue derivatives which share a degree of economic equivalence. Moreover, ESMA notes that already back in 2009 the G20 committed to improve transparency for OTC-derivatives. A broader TOTV approach would deliver on this objective. The situation may be different from a transaction reporting perspective given the somewhat broader scope of the transaction reporting requirements.

197. MiFIR used the same TOTV concept for both transparency and transaction reporting even though the scopes of both obligations are in practice slightly different as explained above. While ESMA has so far considered it more appropriate from a policy and technical perspective to maintain the same TOTV concept applicable to both transparency and transaction reporting, it would welcome views from market participants regarding whether they considered it useful to maintain this approach or to go for different TOTV interpretations for transparency and transaction reporting.

Q16: Do you agree with ESMA's above assessment? If not, please explain.

Q17: Are you of the view that the interpretation of TOTV should remained aligned for both transparency and transaction reporting? If not, please explain why.

198. ESMA is seeking stakeholders' feedback on three possible options going forward (on the basis of a harmonised interpretation for both transparency and transaction reporting). Under option 1, the current approach would be maintained, whereas option 2 and 3 would modify the concept of TOTV by defining the concept directly in the legal framework itself, thereby providing for a clear and sound legal basis adequately taking the situation of OTC derivatives into account.

199. **Option 1:** Maintain the status quo, i.e. the ESMA opinion on TOTV for OTC-derivatives is maintained. This option is already implemented and would hence require no action, but it is likely that many derivatives would continue to be out of scope (in particular for transparency). This approach would not require any changes to the legal framework.

200. **Option 2:** Under option 2, the Level 1 text would clarify that derivatives traded OTC would be considered within scope of transparency and transaction reporting where they share a minimum number of characteristics with derivatives available for trading on trading venues. Such an amendment should be complemented by an empowerment for ESMA to specify the characteristics to be shared between on-venue derivatives and derivatives traded OTC in order for the latter to be considered within scope of the requirements. ESMA should also specify standards for making such transactions post-trade transparent and for transaction reporting.

201. In ESMA's view the ISIN should not be one of the key characteristics to be met in order for an OTC-derivative to be within scope. For instance, where a stock index option on CAC 40 is traded on a trading venue, all OTC stock index options referring to the CAC 40 would be considered within scope, regardless of whether they are sharing the same ISIN or not. In addition, ESMA considers that trading venues should be required to publish on their websites at the beginning of the trading day a list of the derivatives they offer for trading, including information on the sub(-asset) class, so that market participants could determine whether the similar contracts they trade OTC are within scope of MiFIR transaction reporting and transparency.

202. Option 2 would thereby broaden the scope of transparency and transaction reporting, while maintaining the approach that not all OTC-derivatives should be subject to post-trade transparency and transaction reporting. Option 2 would require changing the current level 1 text as well as developing new level 2 measures.

203. **Option 3**: Under option 3, the concept of TOTV for OTC-derivatives would be abandoned and, in principle, any OTC-derivative would be subject to post-trade transparency and transaction reporting. This approach would closely follow the approach chosen in the US for derivatives as set out in section 727 of the Dodd Frank Act and further specified in 17 CFR part 43 for post-trade transparency.

204. According to rules in the US real-time reporting and public dissemination requirements apply to all publicly reportable swap transactions (interest rate, credit, equity, foreign exchange, and other commodity), including swaps executed on-venue as well as OTC. In particular, 17 CFR part 43 further specifies the meaning of a publicly reportable swap transaction as 'Any executed swap that is an arm's-length transaction between two parties that results in a corresponding change in the market risk position between the two parties; or any termination, assignment, novation, exchange, transfer, amendment, conveyance, or extinguishing of rights or obligations of a swap that changes the pricing of the swap. […]'

205. Nevertheless, this approach would still allow to exempt certain transactions from post-trade transparency and transaction reporting, in particular non-price forming OTC-

transactions as specified in Article 12 of RTS 2 and Article 2(5) of RTS 22 or transactions for portfolio compression (Article 31 of MiFIR).

206. This approach would significantly broaden the scope of OTC-derivatives subject to post-trade transparency and transaction reporting but would, at the same time, simplify the regime and remove incentives to move trading to the OTC-space to circumvent the MiFIR requirements. This approach would be a radical change compared to the current approach and would require significant adjustments by market participants. Option 3 would require an amendment of the L1 text and an L2 empowerment to specify types of transactions to be exempted from the post-trade transparency and transaction reporting requirements.

207. It should be noted that options 2 and 3 would be operationally complex to implement compared to the current approach (Option 1), both from the perspective of the ESMA IT-systems but also for the publication of post-trade transparency information and the reporting of transactions.

Q18: Which of the three options proposed, would you recommend (Option 1, Option 2 or Option 3)? In case you recommend an alternative way forward, please explain.

3.2.2.4 Temporary suspension of transparency

A. Analysis

208. To date the provisions in Articles 9(4), 11(2) and 21(4) of MiFIR to temporarily suspend the pre- and post-trade transparency requirements for non-equity instruments where the liquidity of a class of financial instruments falls below a certain threshold have never been used by a CA.

209. The provisions in RTS 2 further specifying the parameters and methods for a temporary suspension, take into account that a temporary suspension should only be considered where there has been a significant drop in liquidity compared to a sufficiently long reference period to avoid a temporary suspension due to for instance seasonal effects. Moreover, the approach reflects that liquidity in illiquid instruments may be more volatile than for liquid instruments and therefore provided for a more restrictive threshold for suspending the transparency provisions for illiquid instruments.

210. ESMA considers that co-legislators may have introduced this provision as an ‘emergency brake’ in case of detrimental effects of the transparency provisions, for instance in case of a miscalibration of the transparency requirements. It should be noted that the transparency requirements have been calibrated very conservatively to avoid possible detrimental effects of the transparency requirements.

211. ESMA considers that the concept of a temporary suspension of the transparency provisions as currently set out in MiFIR raises a number of questions:

212. It is not clear what the objective of such a temporary suspension is. In case of events that might significantly damage investors' interests or the orderly functioning of the market, trading venues and CA can already suspend instruments from trading. The consequence of such a suspension includes that the pre- and post-trade transparency requirements no longer apply (since the instrument is no longer TOTV). Hence, it is unclear in which circumstances CAs may want to use the possibility to temporarily suspend the transparency obligation while not suspending the instrument from trading.

213. Most non-equity instruments are currently considered as not having a liquid market and therefore the large majority of orders are waived from pre-trade transparency and most transactions are only published with a deferral of 2 days or 4 weeks. It is unclear what the purpose of suspending illiquid instruments would be, since for these instruments the transparency requirements are already largely disapplied.

214. The possibility to temporarily suspend the transparency obligations is limited to the jurisdiction of the CA using this option and there is no EU wide mechanism, despite the fact that calculations are supposed to be performed at EU level. For instance, should one CA decide to temporarily suspend the transparency obligations for sovereign bonds, such suspension would be limited to sovereign bonds traded on trading venues established in that jurisdiction and to sovereign bonds traded by investment firms established in that jurisdiction. In other words, unless there is a coordinated action by CAs, despite an EU-wide drop in liquidity of sovereign bonds, the transparency obligations would continue applying in all other jurisdictions, thereby distorting the level playing field.

215. Last but not least, in order to exercise such an option an NCA is expected to perform the calculations using trading activity recorded at EU level and all NCAs are facing the issue to collect this data.

B. Conclusions and Proposals

216. In view of the issues identified above and taking into account that to date no CA used, or even considered suspending the transparency obligations, ESMA suggests removing the possibility to temporarily suspend the transparency obligations.

217. Alternatively, should there be demand for maintaining this provision, ESMA would recommend introducing a mechanism ensuring that where the thresholds are met, the temporary suspension is applied across the Union.

Q19: What is your view on the proposal to delete the possibility for temporarily suspending the transparency provisions? Please explain.

3.3 Trading obligation derivatives

218. The trading obligation for derivatives (DTO) is specified in Title V of MiFIR, in particular Articles 28 and 32 to 34 of MiFIR and is closely connected to the clearing obligation for derivatives (CO) under Regulation (EU) No 648/2012 (EMIR).

219. This section assesses the legal framework of the DTO.

3.3.1 Assessment of the legal framework

3.3.1.1 Article 28 of MIFIR

A. Analysis

220. Pursuant to Article 28(1) of MiFIR, financial counterparties and certain non-financial counterparties, as defined in EMIR and specified in the RTS determining the classes of derivatives subject to the CO, are required to trade derivatives subject to the DTO on regulated markets, MTFs, OTFs or third-country trading venues following an equivalence decision by the Commission under Article 28(4) of MiFIR.

Equivalence decisions

221. According to Article 28(4) of MiFIR, "The legal and supervisory framework of a third country is considered to have equivalent effect where that framework fulfils all the following conditions:

- trading venues in that third country are subject to authorisation and to effective supervision and enforcement on an ongoing basis;
- trading venues have clear and transparent rules regarding admission of financial instruments to trading so that such financial instruments are capable of being traded in a fair, orderly and efficient manner, and are freely negotiable;
- issuers of financial instruments are subject to periodic and ongoing information requirements ensuring a high level of investor protection;
- it ensures market transparency and integrity via rules addressing market abuse in the form of insider dealing and market manipulation;"

222. Currently two equivalence decisions have been adopted by the Commission. The first relates to the CFTC-authorised designated contract markets (DCMs) and swap execution facilities (SEFs)[22] in the US and the other one to Singapore approved exchanges and recognised market operators[23].

[22] Commission Implementing Decision (EU) 2017/2238 of 5 December 2017 on the equivalence of the legal and supervisory framework applicable to designated contract markets and swap execution facilities in the United States of America in accordance with Regulation (EU) No 600/2014 of the European Parliament and of the Council (OJ L 320, 6.12.2017, p. 11).
[23] Commission Implementing Decision (EU) 2019/541 of 1 April 2019 on the equivalence of the legal and supervisory framework applicable to approved exchanges and recognised market operators in Singapore in accordance with Regulation (EU) No 600/2014 of the European Parliament and of the Council (OJ L 93, 2.4.2019, p. 18).

Circumvention provisions

223. Article 28(2) of MiFIR introduces provisions aiming at preventing the circumvention of the DTO via third-country entities. Pursuant to Article 28(2) of MiFIR, the DTO should apply (i) to transactions of counterparties subject to the DTO with third-country financial entities that would be subject to the CO if they were established in the Union; and (ii) to third-country entities that would be subject to the DTO if they were established in the Union provided that the contract has a direct, substantial and foreseeable effect within the Union or where such obligation is necessary or appropriate to prevent the evasion of the DTO.

224. The types of contracts which have a direct, substantial and foreseeable impact in the Union and the cases where the DTO is necessary or appropriate are further specified in Commission Delegated Regulation 2017/579[24] (RTS 5). The RTS closely follows the approach chosen for a parallel provision in Article 4(1)(a)(iv) and (v) of EMIR, which is further specified in Commission Delegated Regulation (EU) No 285/2014[25].

225. To ESMA's knowledge, so far, the provisions in Article 28(2) have never been applied. However, following Brexit, it is likely that counterparties established in the UK and subject to the UK CO and DTO would be considered as third-country financial entities that would be subject to the EU CO if they were established in the Union. As a consequence, EU counterparties subject to the DTO would be required to conclude transactions in derivatives subject to the EU DTO with such UK counterparties on trading venues (either in the EU or on equivalent third-country trading venues) in accordance with Article 28(2) of MiFIR. Furthermore, at the same time, UK counterparties would have to comply with the UK DTO and to conclude transactions on venues eligible to comply with the UK DTO.

Trading of derivatives subject to the DTO on a non-exclusive and non-discriminatory basis

226. Article 28(3) of MiFIR states that the derivatives subject to the trading obligation should be traded or admitted to trading on a trading venue on a non-exclusive and non-discriminatory basis. ESMA has not been made aware of any issues concerning the provision in Article 28(3) of MiFIR and therefore currently does not consider it necessary to amend this provision.

Link to the Clearing Obligation (CO)

227. The DTO is closely linked to the CO under EMIR since according to Articles 28(1) and 32(1) of MiFIR, the introduction of the CO is the precondition for the DTO and triggers the need to assess whether the class of derivatives should also be subject to the DTO.

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[24] Commission Delegated Regulation (EU) 2017/579 of 13 June 2016 supplementing Regulation (EU) No 600/2014 of the European Parliament and of the Council on markets in financial instruments with regard to regulatory technical standards on the direct, substantial and foreseeable effect of derivative contracts within the Union and the prevention of the evasion of rules and obligations, OJ L 87, 31.3.2017, p. 189; https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R0579

[25] Commission Delegated Regulation (EU) No 285/2014 of 13 February 2014 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on direct, substantial and foreseeable effect of contracts within the Union and to prevent the evasion of rules and obligations, OJ L 85, 21.3.2014, p. 1, https://eur-lex.europa.eu/eli/reg_del/2014/285/oj

According to Article 32(1) of MiFIR, ESMA should within 6 months after the adoption of RTS on the CO by the Commission submit draft RTS specifying which of the classes subject to the CO should be subject to the DTO specifying the dates from which the DTO takes effect.

228. To date, ESMA analysed several classes of interest rate, credit, equity and foreign-exchange OTC derivatives and proposed some of them for the CO. The CO currently applies to some OTC interest rate derivatives denominated in EUR, GBP, JPY, USD, NOK, PLN, and SEK; and certain CDS on European corporate indices. ESMA assessed some equity derivatives as well as non-deliverable FX forwards but did not propose to include these classes of derivatives in the CO.

229. However, in order to reduce systemic risk, the set of classes subject to the CO may evolve and ESMA will continue analysing the different classes of derivatives to assess whether they are suitable for the CO.

230. Following the amendment of EMIR (EMIR Refit)[26], the scope of counterparties subject to the CO (Article 4a) has been amended. ESMA already conducted the review on the alignment of MiFIR with the changes introduced by EMIR Refit in January 2020 and recommended a full alignment between the CO and the DTO provisions on the scope of counterparties.[27]

B. Conclusions and Proposals

231. At this point in time, ESMA does not consider it necessary to amend the provisions in Article 28 of MiFIR other than the alignment of the MiFIR provisions to reflect the EMIR Refit changes.

Q20: Do you have any remarks on the assessment of Article 28 of MiFIR? Please explain.

3.3.1.2 Article 32 of MiFIR

3.3.1.2.1 The determination of derivatives that should be subject to the DTO

A. Analysis

232. Article 32(1) of MiFIR sets out the procedure to determine the classes of derivatives that are subject to the DTO and requires ESMA to draft RTS specifying the classes of derivatives subject to the DTO and the dates from which the DTO takes effect for different categories of counterparties as defined in the RTS specifying the CO. A precondition for a class of derivatives (or a subset) to be considered subject to the DTO is that it should first be declared subject to the CO (see above).

[26] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02012R0648-20190617&from=EN
[27] https://www.esma.europa.eu/sites/default/files/library/esma70-156-2076_emir_final_report_on_alignment_clearing_and_trading_obligations.pdf

233. Article 32(2) of MiFIR specifies two further conditions for a class of derivatives subject to the CO to be considered for the DTO: (i) the class of derivatives (or a subset) must be admitted to trading or traded on at least one trading venue as referred to in Article 28(1) of MiFIR (Article 32(2)(a), 'the venue test'), and (ii) there must be sufficient third-party buying and selling interest in the class of derivatives (or a sub-set) so that it is sufficiently liquid to trade only on the venues referred to in Article 28(1) (Article 32(2)(b), 'the liquidity test').

The venue test

234. When drafting the RTS specifying the DTO, ESMA assessed the criterion of whether 'a class of derivatives is admitted to trading or traded on at least one trading venue' using the concept of a trading venue making a class of derivatives available to trading, i.e. the trading venue offers to trade a class of derivatives to its members, and participants or clients.

235. This concept was used since a) most trading venues (MTFs and OTFs) offering trading in derivatives do not have a process in place for admitting instruments to trading, and b) ESMA considered that the venue test should focus on whether a specific class of derivatives is available for trading on a European trading venue and not on an assessment of actual trading of a specific derivative (since the latter is done under the liquidity test, see below).

The liquidity test

236. Article 32(2)(b) of MiFIR, as further specified in Article 32(3) of MiFIR and in Commission Delegated Regulation (EU) 2016/2020[28] (RTS 4), sets out the following criteria for the liquidity test:

- the average frequency of trades over a range of market conditions;
- the average size of trades over a range of market conditions;
- the number and type of active market participants; and
- the average size of spreads.

237. When drafting the RTS specifying the DTO, ESMA initially aimed at doing a quantitative assessment of these criteria, including the use of minimum thresholds to be met. However, this approach proved difficult to apply and, following the feedback received from stakeholders, ESMA opted for a holistic approach, which is not based on fixed thresholds

[28]Commission Delegated Regulation (EU) 2016/2020 of 26 May 2016 supplementing Regulation (EU) No 600/2014 of the European Parliament and of the Council on markets in financial instruments with regard to regulatory technical standards on criteria for determining whether derivatives subject to the clearing obligation should be subject to the trading obligation (Text with EEA relevance), *OJ L 313, 19.11.2016, p. 2,* https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2016.313.01.0002.01.ENG&toc=OJ:L:2016:313:TOC%20OJ%20L%20313,%2019.11.2016,%20p.%202%E2%80%935

but rather relies on a combined quantitative and qualitative assessment of the above criteria. The approach focussed in particular on the criterion of ‘frequency of trading’, which was complemented by the other criteria.

238. This approach was chosen due to:

- The lack of high-level quality and sufficiently granular data covering trading activities in the Union in derivatives subject to the CO[29];

- The lack of available data on the number and type of market participants, including market makers;

- The lack of data on the average size of spreads;

- The ambiguity on how to interpret certain criteria, e.g. the ratio of market participants to the average size of transactions, and on how to weigh the different criteria.

239. In order to determine the relevance and the availability of the parameters provided by Level 1 and to assess the effects of MiFID II/MiFIR on the classes subject to the DTO, ESMA carried out a data analysis.

The classes of interest rate derivatives subject to the trading obligation

240. For the purposes of this CP, ESMA collected data for interest rate derivatives which are subject to the trading obligations and which are available for trading (i.e. admitted to trading or first traded on a trading venue) on any trading day of the observation period and available for trading over 2 periods, the first is 11-17 December 2017 (both dates included) and the second is 30 September to 6 October 2019 (both dates included).

241. As specified in Annex III of RTS 2 an interest rate derivative is any contract as defined in Annex I, Section C(4) of Directive 2014/65/EU whose ultimate underlying is an interest rate, a bond, a loan, any basket, portfolio or index including an interest rate, a bond, a loan or any other product representing the performance of an interest rate, a bond or a loan. Furthermore, Fixed-to-Float 'single currency swaps' and futures/forwards on Fixed-to-Float 'single currency swaps' means a swap or a future/forward on a swap where two parties exchange cash flows denominated in the same currency and the cash flows of one leg are determined by a fixed interest rate while those of the other leg are determined by a floating interest rate.

242. The classes of interest rate derivatives subject to the DTO are fixed-to-float single currency interest rate swaps which have, among other specific characteristics, the floating

[29] To be noted that at the time of the assessment, MiFID II did not yet apply and hence, no OTFs were operating in the EU.

rate based on one of the following indices: EURIBOR 3m, EURIBOR 6m, USD LIBOR 3m, USD LIBOR 6m, BP LIBOR 3m and GBP LIBOR 6m.

243. Out of the 30 trading venues included in the ESMA Register for the Trading Obligations[30], 10 trading venues provided data, all of them located in the UK with the exception of three trading venues under the jurisdiction of France, Spain and the Netherlands respectively.

244. From Table 3 below it can be inferred that:

- For fixed-to-float single currency interest rate swaps which have the floating rate based on the EURIBOR 3m:
    - The number of sub-classes having recorded volume in 2018 has increased, 9 more sub-classes traded after MiFID II/MiFIR;
    - The average notional amount traded increased from EUR 1bn to EUR 1.7bn but the average number of transactions decreased from 20 to 17. This hints to an increase in the trade size;
    - The number of market participants and market makers decreased, suggesting a more concentrated market;
    - Last but not least, the average daily volume weighted average spread has relatively increased from 44.58% to 63.46%[31], making the transactions in these instruments more costly.
- For fixed-to-float single currency interest rate swaps which have the floating rate based on the EURIBOR 6m:
    - The number of sub-classes having recorded volume in 2018 has remained stable (14 in 2017 vs. 13 in 2018);
    - The average notional amount traded increased from EUR 2bn to EUR 6.6bn and the average number of transactions also increased from 57 to 115;
    - The number of market participants and market makers remained stable;
    - Last but not least, the average daily volume weighted average spread has increased from 37.32% to 57.35%[32], making the transactions in these instruments more costly.

[30] https://www.esma.europa.eu/sites/default/files/library/public_register_for_the_trading_obligation.pdf
[31] Excluding negative values
[32] Excluding the outlier value of 2530%

- For fixed-to-float single currency interest rate swaps which have the floating rate based on the USD LIBOR 3m:
    - The number of sub-classes having recorded volume in 2018 has slightly increased (31 in 2017 vs. 35 in 2018);
    - The average notional amount traded increased from EUR 265M to EUR 475M and the average number of transactions also increased from 7 to 16;
    - The number of market participants and market makers slightly increased;
    - Last but not least, the average daily volume weighted average spread has increased from 25.13% to 48.41%, making the transactions in these instruments more costly.
- For fixed-to-float single currency interest rate swaps which have the floating rate based on the USD LIBOR 6m:
    - The trading activity was null in 2017 and is close to null in 2018. In other words, no significant change in trading has occurred for this asset class.
- For fixed-to-float single currency interest rate swaps which have the floating rate based on the GBP LIBOR 3m:
    - The number of sub-classes having recorded volume in 2018 increased (5 in 2017 vs. 18 in 2018);
    - The average notional amount traded increased from EUR 128M to EUR 324M and the average number of transactions also increased from 2 to 4;
    - The number of market participants and market makers increased also due to the increased number of traded sub-classes;
    - Last but not least, the average daily volume weighted average spread has decreased from 76.80% to 57.18%, making the transactions in these instruments less costly.
- For fixed-to-float single currency interest rate swaps which have the floating rate based on the GBP LIBOR 6m:
    - The number of sub-classes having recorded volume in 2018 has remained stable (9 in 2017 vs. 10 in 2018);
    - The average notional amount traded increased from EUR 433M to EUR 2.9bn and the average number of transactions also increased from 9 to 58;
    - The number of market participants and market makers slightly increased;

- Last but not least, the average daily volume weighted average spread has decreased from 73.63% to 63.37%, making the transactions in these instruments less costly.

TABLE 3 STATISTICS FOR INTEREST RATE DERIVATIVES RESULTING FROM THE DATA COLLECTION

Reference data											Transaction data Data related to period 1: 11-17 December 2017												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	EUR	SPO2	No	T_2Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	19	1,784,772,000	5	7	7	32	23.33%	26.67%	23.33%	25.97%	25.90%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	23	704,673,000	5	7	10	32	43.00%	43.57%	44.13%	40.00%	45.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	53	3,095,772,000	5	7	13	32	40.00%	40.97%	40.67%	44.25%	40.65%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	14	629,200,000	3	7	6	32	50.00%	43.19%	41.06%	45.00%	50.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	20	730,234,000	5	7	9	32	40.64%	36.25%	40.00%	40.00%	42.95%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	31	1,227,217,000	5	7	13	32	40.70%	40.00%	42.50%	43.22%	45.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	14	162,981,000	4	7	11	32	50.00%	50.00%	60.00%	60.00%	50.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	5	68,150,000	2	7	4	32	55.00%	60.00%	55.00%	60.00%	60.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	24	1,188,692,000	5	7	9	32	40.00%	40.00%	35.00%	36.07%	35.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	1	4,250,000	1	7	1	32	60.00%	55.00%	60.00%	60.00%	60.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data — Data related to period 2: 30 September - 6 October 2019												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	EUR	SPO2	No	T_2Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	42	6,494,431,003	5	7	14	31	71.92%	73.64%	60.28%	60.73%	60.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	42	2,925,661,003	5	7	14	31	65.13%	59.73%	62.84%	53.33%	52.77%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	32	3,471,275,001	5	7	10	31	63.66%	53.33%	61.42%	58.36%	46.67%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	16	710,319,000	2	7	6	31	63.65%	53.33%	52.69%	40.00%	46.67%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	18	1,271,942,001	4	7	8	31	63.61%	58.51%	52.69%	40.00%	53.06%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	37	2,084,384,000	5	7	10	31	84.11%	77.11%	69.64%	62.85%	70.28%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	18	988,233,000	4	7	7	31	67.89%	67.06%	40.00%	54.99%	53.33%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	16	462,989,003	5	7	5	31	66.67%	74.54%	67.70%	74.21%	53.33%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	33	2,241,499,001	5	7	16	31	64.50%	63.41%	60.86%	48.79%	50.98%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	AA	30/360	EURIBOR 3M	QA	Actual/360	6	154,892,000	2	7	4	31	100.00%	100.00%	90.00%	91.03%	91.77%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	14	4,610,500,006	2	5	8	-	0.00%	0.00%	0.00%	-10.90%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	11	1,925,000,007	3	5	8	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	8	1,000,000,004	3	5	6	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	3	220,000,000	1	3	2	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	2	750,000,001	1	3	3	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	12	1,040,000,004	3	5	9	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	3	200,000,002	1	4	4	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	3	165,000,001	1	4	3	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	7	1,950,000,002	2	5	5	-	0.00%	-9.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	AA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	SA	30/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	SA	Actual/360	EURIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

ESMA PUBLIC USE

Reference data											Transaction data Data related to period 1: 11-17 December 2017												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	EUR	SPO2	No	T_2Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	1	30,000,000	1	5	-	-	0.00%	0.00%	0.00%	8.60%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	36	3,135,037,000	5	7	16	32	35.00%	37.04%	35.00%	37.00%	35.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	44	2,427,786,000	5	7	17	32	25.41%	26.67%	26.67%	37.07%	27.48%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	113	4,479,655,000	5	7	27	32	36.45%	35.00%	35.00%	36.41%	35.19%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	38	1,117,363,000	5	7	16	32	35.00%	35.00%	36.18%	35.43%	45.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	48	1,854,196,000	5	7	15	32	35.00%	35.00%	35.00%	37.44%	35.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	237	6,005,770,000	5	7	30	32	59.28%	24.04%	60.03%	61.51%	23.88%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	23	417,783,000	5	7	14	32	45.00%	40.00%	44.00%	45.00%	40.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	46	1,006,750,000	5	7	16	32	28.34%	83.33%	28.76%	84.85%	30.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	51	3,665,800,000	5	7	19	32	23.47%	23.33%	23.33%	23.33%	23.33%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	33	1,163,984,000	5	7	10	32	35.62%	37.87%	35.00%	35.69%	35.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	28	1,313,352,000	4	7	12	32	35.34%	35.00%	35.00%	35.00%	50.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	11	196,619,000	4	7	9	32	40.00%	50.00%	40.00%	45.00%	44.23%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	84	1,420,664,000	5	7	21	32	88.56%	33.33%	91.30%	90.61%	32.19%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 2: 30 September - 6 October 2019												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	EUR	SPO2	No	T_2Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	AA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	57	10,199,456,007	5	7	14	31	75.18%	74.02%	59.99%	59.88%	57.82%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	51	6,516,021,006	5	7	14	31	64.87%	53.63%	57.84%	50.88%	51.23%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	201	16,226,825,005	5	7	31	31	57.65%	56.91%	52.18%	46.03%	37.80%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	35	1,891,036,000	5	7	16	31	58.11%	52.84%	46.57%	2530.00%	40.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	92	6,019,955,004	5	7	19	31	58.26%	52.51%	46.34%	52.65%	57.02%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	465	20,584,475,686	5	7	41	31	64.39%	52.04%	50.90%	57.49%	48.20%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	77	2,859,176,006	5	7	20	31	78.96%	67.19%	61.88%	60.37%	64.89%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	146	4,661,701,008	5	7	29	31	79.51%	58.62%	57.54%	58.76%	53.51%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	51	6,242,716,998	5	7	14	31	46.64%	42.72%	47.26%	43.06%	37.58%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	22	998,604,001	5	7	12	31	61.45%	51.94%	50.96%	51.27%	45.79%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	67	2,656,715,000	5	7	20	31	57.55%	52.30%	46.34%	51.92%	46.20%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	41	4,323,354,001	5	7	14	31	65.42%	60.26%	60.62%	52.55%	53.83%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	AA	30/360	EURIBOR 6M	SA	Actual/360	195	3,224,875,002	5	7	32	31	100.89%	89.83%	84.42%	68.52%	66.92%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	AA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 1: 11-17 December 2017												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	EUR	SPO2	No	T_12Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data										Transaction data Data related to period 2: 30 September - 6 October 2019												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	EUR	SPO2	No	T_12Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	AA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	SA	30/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	SA	30/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	SA	Actual/360	EURIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_2Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_4Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_5Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_6Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_7Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_10Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_15Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_20Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_3Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_8Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_9Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_12Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	EUR	SPO2	No	T_30Y	COS	SA	Actual/360	EURIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 1: 11-17 December 2017												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	GBP	SPOT	No	T_2Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	2	193,494,385	2	7	3	21	90.00%	100.00%	80.00%	100.00%	80.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_4Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	2	88,527,586	1	7	2	21	95.00%	80.00%	90.00%	90.00%	90.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_5Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	7	-	21	100.00%	100.00%	100.00%	100.00%	90.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_6Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	7	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_7Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	1	15,202,350	1	7	2	21	110.00%	100.00%	100.00%	100.00%	100.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_10Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	5	-	21	110.00%	80.00%	100.00%	100.00%	90.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_15Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	7	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_20Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	7	-	21	130.00%	100.00%	100.00%	100.00%	100.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_3Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	4	316,169,572	2	7	4	21	90.00%	90.00%	70.00%	90.00%	65.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_8Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	7	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_9Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	7	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_12Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	7	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_30Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	7	-	21	130.00%	120.00%	100.00%	100.00%	100.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_2Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_4Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_5Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	1	28,367,893	1	7	1	1	0.00%	110.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_6Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_7Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	7	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_10Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	7	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_15Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	7	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_20Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_3Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	7	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_8Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_9Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_12Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_30Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 2: 30 September - 6 October 2019												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	GBP	SPOT	No	T_2Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	12	1,665,302,841	3	7	8	23	90.00%	80.00%	81.42%	82.57%	80.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_4Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	6	393,606,492	2	7	4	23	80.00%	92.80%	80.00%	86.96%	80.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_5Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	10	1,313,483,361	3	7	2	23	80.00%	94.55%	80.00%	84.99%	86.44%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_6Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	1	189,610,045	1	7	1	1	0.00%	0.00%	0.00%	109.47%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_7Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	5	205,589,051	3	7	2	23	90.00%	80.00%	87.82%	87.13%	93.36%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_10Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	2	125,240,370	2	5	4	23	80.00%	80.00%	80.00%	70.00%	70.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_15Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	2	10,465,124	2	7	1	1	120.03%	0.00%	0.00%	116.63%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_20Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	3	14,698,175	2	7	2	23	90.00%	100.00%	103.18%	105.85%	90.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_3Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	11	1,639,328,839	4	7	5	23	80.00%	81.34%	82.86%	81.86%	79.03%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_8Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	3	117,366,930	2	7	2	3	0.00%	0.00%	104.84%	105.33%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_9Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	4	54,688,713	4	7	2	3	102.51%	139.94%	105.55%	106.26%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_12Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	2	7,876,975	2	7	2	2	0.00%	83.49%	0.00%	112.48%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_30Y	COS	QA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	3	16,848,838	2	7	4	23	90.00%	90.00%	90.00%	90.00%	105.50%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_2Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_4Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_5Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	1	4,501,129	1	7	1	1	0.00%	0.00%	0.00%	75.97%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_6Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_7Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	1	13,053,273	1	7	1	1	0.00%	0.00%	0.00%	81.33%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_10Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	1	3,938,488	1	7	1	1	83.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_15Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	1	3,150,790	1	7	1	1	0.00%	88.33%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_20Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_3Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	2	48,612,190	2	7	2	2	0.00%	90.20%	0.00%	82.79%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_8Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_9Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_12Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_30Y	COS	SA	Actual/365F	GBP LIBOR 3M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 1: 11-17 December 2017												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	GBP	SPOT	No	T_2Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_4Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_5Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_6Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_7Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_10Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_15Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_20Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_3Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_30Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_2Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_4Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_5Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_6Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_7Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_10Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_15Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_20Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_3Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_30Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_2Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_4Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_5Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_6Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_7Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_10Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_15Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_20Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_3Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_30Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_2Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	6	1,616,022,536	2	7	7	21	80.00%	90.00%	80.00%	80.00%	65.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_4Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	4	198,193,600	4	7	6	21	80.00%	70.00%	80.00%	80.00%	80.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_5Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	12	625,372,389	4	7	6	21	80.00%	65.00%	60.00%	80.00%	60.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_6Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	3	63,418,860	1	7	3	21	80.00%	65.00%	80.00%	80.00%	80.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_7Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	7	-	21	80.00%	70.00%	70.00%	80.00%	70.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_10Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	22	636,282,455	5	7	10	21	68.28%	64.00%	40.00%	63.93%	40.16%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_15Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	2	20,269,800	1	7	3	21	80.00%	80.00%	80.00%	80.00%	80.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_20Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	6	46,378,730	3	7	5	21	100.00%	90.00%	80.00%	80.00%	70.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_3Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	7	473,655,699	2	7	9	21	80.00%	60.00%	80.00%	80.00%	80.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_30Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	23	216,592,502	4	7	10	21	76.33%	73.33%	40.00%	50.00%	82.25%	0.00%	0.00%

Reference data											Transaction data Data related to period 2: 30 September - 6 October 2019												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	GBP	SPOT	No	T_2Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_4Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_5Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_6Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_7Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_10Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_15Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_20Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_3Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_30Y	COS	QA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_2Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_4Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_5Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_6Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_7Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_10Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_15Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_20Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_3Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_30Y	COS	QA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_2Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_4Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_5Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_6Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_7Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_10Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_15Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_20Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_3Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_30Y	COS	SA	Actual/365F	GBP LIBOR 6M	QA	Actual/365F	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_2Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	16	2,191,016,741	4	7	8	23	70.00%	70.00%	70.00%	71.15%	70.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_4Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	13	1,760,388,554	4	7	8	23	69.45%	60.00%	60.00%	70.00%	70.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_5Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	112	8,083,221,209	5	7	17	23	70.18%	68.90%	64.63%	63.56%	71.48%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_6Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	6	930,496,206	2	7	4	23	70.23%	60.00%	60.00%	63.72%	70.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_7Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	15	1,374,536,336	2	7	8	23	70.00%	70.00%	63.13%	60.00%	65.46%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_10Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	232	9,191,272,407	5	7	20	23	43.38%	47.11%	47.88%	44.52%	43.35%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_15Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	26	964,049,462	4	7	12	23	53.33%	53.33%	46.67%	51.56%	53.33%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_20Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	36	1,071,325,608	4	7	13	23	81.66%	80.00%	70.00%	70.00%	80.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_3Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	16	1,738,410,758	4	7	7	23	71.35%	69.41%	60.00%	60.00%	60.00%	0.00%	0.00%
SWAP	GBP	SPOT	No	T_30Y	COS	SA	Actual/365F	GBP LIBOR 6M	SA	Actual/365F	109	1,776,867,738	5	7	16	23	65.58%	69.20%	60.00%	58.59%	56.43%	0.00%	0.00%

Reference data											Transaction data Data related to period 1: 11-17 December 2017											
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	USD	SPO2	No	T_2Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	3	210,351,321	3	7	2	3	39.49%	39.11%	38.51%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	5	144,192,438	3	7	5	5	33.76%	38.54%	39.05%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	4	45,802,304	3	7	3	4	0.00%	38.14%	45.02%	0.00%	36.07%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	2	78,033,554	2	7	2	1	0.00%	0.00%	44.70%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	1	15,012,977	1	7	1	1	0.00%	0.00%	36.95%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	4	21,204,770	2	7	2	4	0.00%	34.21%	0.00%	0.00%	36.35%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	7	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	1	4,240,954	1	7	1	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	6	241,734,381	4	7	2	5	40.33%	43.65%	36.38%	37.77%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	1	8,481,908	1	7	1	1	0.00%	0.00%	0.00%	38.38%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	7	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	1	85,220,000	1	5	2	20	20.00%	20.00%	20.00%	30.00%	20.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	1	8,522,000	1	5	2	20	30.00%	30.00%	30.00%	30.00%	30.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	5	-	20	30.00%	30.00%	25.00%	30.00%	30.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	5	-	20	30.00%	30.00%	30.00%	30.00%	30.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	2	30,673,235	1	5	4	20	30.00%	30.00%	30.00%	30.00%	30.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	1	4,261,000	1	5	2	20	20.00%	30.00%	30.00%	30.00%	30.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	1	37,496,800	1	5	2	20	30.00%	30.00%	20.00%	30.00%	30.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	5	-	20	30.00%	30.00%	30.00%	30.00%	30.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	17	912,437,537	4	7	11	20	28.42%	26.97%	26.52%	29.54%	30.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	13	380,559,694	4	7	9	20	33.71%	33.12%	32.34%	32.86%	30.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	24	1,271,642,707	5	7	16	20	30.00%	29.87%	32.72%	20.00%	33.52%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	6	296,357,869	4	7	5	5	0.00%	0.00%	0.00%	34.36%	34.76%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	9	356,522,656	5	7	5	20	31.75%	32.01%	30.00%	30.00%	30.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	26	429,150,464	5	7	13	20	27.13%	33.32%	27.16%	39.88%	40.35%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	5	63,571,330	3	7	4	20	30.72%	20.00%	30.00%	30.00%	36.18%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	3	117,105,838	2	7	2	20	30.00%	30.00%	30.00%	30.00%	36.28%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	13	741,895,027	5	7	8	20	30.00%	34.04%	30.00%	31.43%	31.77%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	1	23,861,600	1	7	2	20	30.00%	30.00%	30.00%	40.00%	30.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	17	112,111,559	5	7	4	20	39.57%	30.00%	35.34%	36.53%	38.37%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 2: 30 September - 6 October 2019											
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	USD	SPO2	No	T_2Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	20	1,401,028,513	5	7	8	10	69.28%	55.12%	60.39%	58.96%	54.81%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	8	290,252,919	4	7	6	5	46.88%	48.94%	51.06%	46.07%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	8	283,115,552	3	7	4	6	0.00%	48.91%	51.01%	0.00%	50.85%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	2	39,987,555	1	7	2	2	0.00%	0.00%	0.00%	68.10%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	5	112,184,766	3	7	3	4	0.00%	51.80%	0.00%	48.87%	53.83%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	13	196,369,093	5	7	8	9	56.15%	50.76%	47.73%	48.12%	51.12%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	4	47,307,932	3	7	4	4	55.18%	55.50%	53.32%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	2	21,046,082	2	7	2	2	0.00%	60.97%	0.00%	0.00%	56.80%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	13	455,235,899	3	7	5	8	0.00%	50.95%	55.33%	0.00%	57.04%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	1	8,509,937	1	7	1	1	0.00%	0.00%	48.28%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	7	95,896,929	5	7	2	5	65.88%	52.13%	58.93%	53.80%	61.08%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	8	114,513,236	3	5	4	20	50.00%	50.00%	50.00%	50.00%	50.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	2	21,907,899	2	5	4	20	50.00%	50.00%	50.00%	50.00%	50.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	6	76,974,387	2	5	4	20	50.00%	50.00%	50.00%	50.00%	50.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	2	136,119,000	1	5	3	20	60.00%	40.00%	40.00%	40.00%	40.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	3	21,641,106	2	5	4	20	60.00%	40.00%	40.00%	40.00%	40.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	5	-	20	70.00%	70.00%	70.00%	70.00%	70.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	2	23,584,680	1	5	2	20	50.00%	50.00%	50.00%	50.00%	50.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	1	6,072,722	1	5	2	20	70.00%	70.00%	70.00%	70.00%	70.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	46	5,568,515,845	5	7	18	20	60.99%	45.51%	43.54%	48.32%	47.75%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	34	636,097,212	5	7	20	20	58.11%	46.05%	42.78%	46.80%	44.51%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	74	2,248,290,646	5	7	31	20	56.57%	43.52%	42.13%	43.49%	43.63%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	15	244,958,091	5	7	11	12	51.88%	47.23%	45.87%	52.88%	49.84%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	29	382,569,950	5	7	15	20	56.98%	42.73%	41.05%	48.55%	44.32%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	96	1,779,314,715	5	7	24	20	63.27%	42.55%	62.47%	43.41%	44.38%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	25	345,445,863	5	7	14	20	62.71%	61.41%	61.87%	61.71%	66.44%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	18	239,172,972	4	7	12	20	70.00%	63.09%	62.01%	67.35%	65.30%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	27	870,197,736	5	7	16	20	59.70%	44.32%	43.05%	44.82%	44.41%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	13	121,016,017	4	7	7	20	62.02%	64.24%	60.00%	63.59%	63.24%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	41	345,871,138	5	7	13	20	69.56%	66.76%	64.97%	66.93%	68.30%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 1: 11-17 December 2017													
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	USD	IMMD	No	T_2Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	1	35,839,271	1	5	2	19	20.00%	30.00%	20.00%	30.00%	20.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	1	18,896,683	1	5	2	19	20.00%	20.00%	20.00%	30.00%	30.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	7	779,763,000	2	5	2	19	30.00%	25.00%	25.00%	30.00%	25.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	8	813,363,122	2	5	5	19	30.00%	25.00%	30.00%	25.00%	30.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	23	923,784,800	5	5	11	19	30.00%	30.00%	30.00%	30.00%	30.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	2	464,702	1	5	2	19	40.00%	40.00%	40.00%	43.33%	40.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	5	-	19	30.00%	30.00%	30.00%	40.00%	30.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	5	-	19	30.00%	30.00%	30.00%	30.00%	30.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 2: 30 September - 6 October 2019												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	USD	IMMD	No	T_2Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	AA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	2	6,352,220	2	5	3	19	50.00%	50.00%	50.00%	50.00%	50.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	5	8,167,140	4	5	3	19	70.00%	70.00%	70.00%	70.00%	70.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	AA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	5	-	19	55.00%	45.00%	45.00%	45.00%	45.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	3	59,892,360	1	5	5	19	55.00%	45.00%	45.00%	45.00%	45.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	5	-	19	55.00%	45.00%	45.00%	45.00%	45.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	17	297,933,400	5	5	8	19	90.00%	93.33%	93.33%	83.33%	83.33%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	1	24,501,420	1	5	2	19	70.00%	70.00%	70.00%	70.00%	70.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	SA	30/360	USD LIBOR 3M	QA	Actual/360	8	106,029,230	2	5	3	19	50.00%	30.00%	30.00%	30.00%	30.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	SA	Actual/360	USD LIBOR 3M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

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Reference data											Transaction data Data related to period 1: 11-17 December 2017												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	USD	SPO2	No	T_2Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

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Reference data											Transaction data Data related to period 2: 30 September - 6 October 2019												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	USD	SPO2	No	T_2Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 1: 11-17 December 2017												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	USD	SPO2	No	T_30Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	7	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data												
											Data related to period 2: 30 September - 6 October 2019												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	USD	SPO2	No	T_30Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	2	8,692,947	1	7	1	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_2Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_4Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_5Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_6Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_7Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_10Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_15Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_20Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_3Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_12Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	SPO2	No	T_30Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	AA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 1: 11-17 December 2017													
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	USD	IMMD	No	T_3Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 2: 30 September - 6 October 2019												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	USD	IMMD	No	T_3Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	AA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	AA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	AA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	SA	30/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	SA	30/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 1: 11-17 December 2017												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	USD	IMMD	No	T_10Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference data											Transaction data Data related to period 2: 30 September - 6 October 2019												
Contract type	Settlement currency	Trade start type	Optionality	Tenor	Notional type	Fixed leg payment frequency	Fixed leg day count convention	Floating rate index	Floating leg payment frequency	Floating leg day count convention	Total number of transactions	Total volume (in Euros)	Number of days traded	Number of days available for trading	Total number of active market participants	Total number of market makers	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
SWAP	USD	IMMD	No	T_10Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	SA	Actual/360	USD LIBOR 6M	QA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_2Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_4Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_5Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_6Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_7Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_10Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_15Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_20Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_3Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_12Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SWAP	USD	IMMD	No	T_30Y	COS	SA	Actual/360	USD LIBOR 6M	SA	Actual/360	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Source: ESMA

The classes of credit derivatives subject to the trading obligation

245. For the purposes of the CP, ESMA collected data for credit derivatives which are subject to the trading obligations (i.e. Index CDS on the on-the-run and first off-the-run series of the iTraxx Europe Main and iTraxx Europe Crossover settled in EUR with a 5Y tenor) and which are available for trading over 2 periods, the first is 11-17 December 2017 (both dates included) and the second is 30 September to 6 October 2019 (both dates included).

246. Out of the 14 trading venues included in the ESMA Register for the Trading Obligations[33], only three trading venues provided data, all located in the UK.

247. Despite the small number of responses, both sub-classes show to be liquid, before and after MiFID II/MiFIR, if the same parameters used to assess the liquidity of the sub-classes of index CDS for the purpose of the transparency obligations (i.e. average daily number of transactions greater or equal to 10 and average daily notional amount greater or equal to EUR 200,000,000) are used (see Table 4 below).

248. Furthermore, it is evident that the average daily notional amount in 2018 is roughly 4/4.5 times that in 2017 and the number of market participants has almost doubled. However, the average daily spread seems to have remained stable/slightly increased.

TABLE 4 STATISTICS FOR CDS INDICES RESULTING FROM THE DATA COLLECTION

	Data related to period: 11-17 December 2017					Data related to period: 30 September - 6 October 2019				
Underlying reference index	Average daily numnber of transactions	Average daily notional amount	% of days traded	Total number of active market participants (*)	Total number of market makers (*)	Average daily numnber of transactions	Average daily notional amount	% of days traded	Total number of active market participants (*)	Total number of market makers (*)
iTraxx Europe Crossover	18	258,521,637	71%	27.00	14.00	54	1,173,647,571	71%	45.00	15.00
iTraxx Europe Main	17	875,941,429	71%	30.00	14.00	50	3,375,898,773	71%	42.00	16.00

(*) Maximum value collected

Source: ESMA

Underlying reference index	Daily volume weighted average spread D1	Daily volume weighted average spread D2	Daily volume weighted average spread D3	Daily volume weighted average spread D4	Daily volume weighted average spread D5	Daily volume weighted average spread D6	Daily volume weighted average spread D7
Data related to period: 11-17 December 2017							
iTraxx Europe Crossover	2.30	1.42	1.13	1.34	1.27	NA	NA
iTraxx Europe Main	0.09	0.34	0.38	0.29	0.47	NA	NA
Data related to period: 30 September - 6 October 2019							
iTraxx Europe Crossover	1.79	1.99	2.03	1.37	2.25	NA	NA
iTraxx Europe Main	0.41	0.46	0.36	0.43	0.47	NA	NA

(*) Average value collected

Source: ESMA

[33] https://www.esma.europa.eu/sites/default/files/library/public_register_for_the_trading_obligation.pdf

Extension of the DTO to derivatives not cleared or not made available for trading

249. Article 32(4) of MiFIR empowers ESMA to identify and notify to the Commission the classes of derivatives or individual derivative contracts that should be subject to the DTO but for which no CCP has yet received authorisation under Article 14 or 15 of EMIR, or which are not admitted to trading or traded on a trading venue. Following the notification from ESMA, the Commission may publish a call for development of proposals for imposing the DTO on those derivatives.

250. To date, ESMA has not recommended to make classes of derivatives, which are not cleared or not made available for trading, subject to the DTO on the basis of the procedure in Article 32(4) of MiFIR.

B. Conclusions and Proposals

251. While at the time of specifying the first RTS on the DTO, ESMA was initially struggling with the application of the venue and the liquidity tests, ESMA considers that the holistic approach ultimately chosen takes the criteria set out in Article 32 and RTS 4 appropriately into account. While at the time of the assessment, not all criteria were fully taken into account, ESMA considers that they are nevertheless relevant and likely to be assessed for future assessments.

252. ESMA therefore does not consider it necessary to amend the provisions at Level 1 and Level 2.

253. ESMA is seeking feedback from stakeholders whether ESMA should make use of the provision in Article 32(4).

Q21: Do you have any views on the above-mentioned criteria and whether the criteria are sufficient and appropriate for assessing the liquidity of derivatives? Do you consider it necessary to include further criteria (e.g. currency)? Do you consider that ESMA should make use of the provision in Article 32(4) for asset classes currently not subject to the trading obligations? Please explain.

3.3.1.2.2 Suspension of the trading obligation

A. Analysis

254. Pursuant to Article 32(5) of MiFIR, ESMA should submit to the Commission a draft RTS in order to amend, suspend or revoke an existing RTS whenever the trading obligation of a class or a subset thereof is modified following a change in the criteria set out above. The Commission may afterwards adopt these RTS.

255. Therefore, the process for a suspension of a trading obligation does not allow for a shortened procedure to be applicable in case of an emergency linked to market changes that would require an immediate suspension of the DTO. Indeed, the process for

submitting technical standards requires first ESMA to conduct a public consultation and then the Commission to endorse the draft RTS submitted within 3 months.

256. ESMA believes that under certain circumstances a swift suspension of the DTO could be needed to preserve the stability of financial markets in line with what has been agreed for the closely associated CO for derivatives in the EMIR Refit.

257. ESMA recognises that where the suspension of the CO has been requested, and where it is considered to be a material change in the criteria for the DTO to take effect, EMIR Refit enables ESMA to propose the concurrent suspension of the DTO on the basis of EMIR, instead of MiFIR. Under this mechanism, the suspensions of the DTO and the CO would function in parallel: they can be requested at the same time, become effective at the same time and be extended at the same time, for the same period.

258. However, EMIR Refit does not introduce a standalone mechanism to suspend the DTO, without suspending the CO. ESMA considers that there may be circumstances where the CO may not be suspended but which nevertheless require a swift suspension of the DTO. For instance, that could be the case where a class of OTC derivatives becomes unsuitable for mandatory trading on a trading venue or where there has been a material change to one of those criteria in respect of a particular class of OTC derivatives (e.g. sudden change of liquidity due to major market events). Moreover, such a tool may also be necessary for derivatives subject to the DTO following the procedure under Article 32(4) of MiFIR.

B. Conclusions and Proposals

259. Therefore, ESMA recommends establishing a self-standing possibility to suspend the DTO. Such process should closely mirror the process set out in EMIR Refit for the suspension of the CO, including the following steps:

- Where one of following conditions is met, ESMA may submit a request to the Commission to suspend the DTO:

    i. the class of OTC derivative is no longer suitable for the DTO on the basis of the criteria referred to in paragraphs 2 and 3 of Article 32;

    ii. a trading venue is likely to cease trading that specific class of OTC derivative and no other trading venue is making available to trade that class of derivatives without interruption;

    iii. the suspension of the DTO for a specific class of OTC derivative or for a specific type of counterparty is necessary to avoid or address a serious threat to the orderly functioning of the financial markets in the Union and that suspension is proportionate to that aim.

- The Commission should, without undue delay after receipt of the request made by ESMA and based on the reasons and evidence provided by ESMA, either suspend the DTO for the specific class of OTC derivative or for the specific type of counterparty, or reject the requested suspension. The Commission should inform ESMA of its decision and should provide a detailed reasoning explaining it.

- The Commission's decision to suspend the DTO should be communicated to ESMA and should be published in the Official Journal of the European Union, on the Commission's website and in the public register referred to in Article 34 of MiFIR.

- A swift suspension of the DTO should be valid for a period of three months from the date of the publication of that suspension in the Official Journal of the European Union.

- The Commission should notify ESMA of its intention to extend a suspension of the DTO. ESMA should issue an opinion on the extension of the suspension within a short period of time after that notification. After consulting ESMA, the Commission may extend the suspension for additional periods of three months, with the total period of the suspension not exceeding twelve months. An extension of the suspension should be published in accordance with paragraph c.

Q22: Do you agree that a procedure for the swift suspension of the trading obligation for derivatives is needed? Do you agree with the proposed procedure? Please explain.

3.3.1.3 Other issues concerning the derivatives trading obligation

260. ESMA would also like to consult market participants whether they see any other issues with the application of the DTO. One point that could be raised is the application of the DTO to branches and whether the application should be aligned with that of the share trading obligation.

Q23: Do you have a view on this or any other issues related to the application of the DTO?

3.3.1.4 Article 34 of MiFIR

A. Analysis

261. Pursuant to Article 34 of MiFIR, ESMA should publish and maintain on its website a register specifying the derivatives subject to the DTO, the venues where they are admitted to trading or traded, and the dates from which the obligation takes effect.

262. Accordingly, the ESMA register includes 3 sections regarding:

- first the classes of derivatives subject to the DTO;

- second the list of EU and third country trading venues where these classes of derivatives are traded;

- finally, the date from which the DTO takes effect depending on the category of the counterparty.

263. As of today, the DTO applies to 8 classes of OTC fixed to float single currency interest rate swaps denominated in EUR, USD, GBP on Libor and Euribor with main tenors (3M, 6M). The DTO applies also to two classes of index credit default swaps on Itraxx Europe Main and crossover indices with a maturity of 5Y.

B. Conclusions

264. At this stage, ESMA considers the presence of a register as still valid and does not recommend any change in this respect.

Q24: Do you have any views on the functioning of the register? Please explain.

4 Level 2 review

265. This section of the CP focuses on changes to Level 2, in particular to RTS 2.

266. More specifically, Section 4.1 covers the annual review of RTS 2 required to change the parameter to assess the liquidity of bonds on a quarterly basis, and the percentile used to determine the pre-trade SSTI threshold for certain non-equity instruments. Furthermore, in Section 4.2, ESMA is providing a targeted review of RTS 2 only in relation to commodity derivatives. ESMA might consult on a broader RTS 2 review (including the methodology to perform the transparency calculations for other non-equity instruments than commodity derivatives) at another point in time.

4.1 Annual RTS 2 review

4.1.1 Introduction

267. The transparency regime for non-equity instruments is currently subject to a four-stage phase-in for the determination of the liquidity status of bonds (based on the criterion 'average daily number of trades') and the level of the pre-trade SSTI threshold for most derivatives (based on trade percentiles). The details of the phase-in regime are set out in Article 17 of RTS 2. Currently, the thresholds for both the liquidity determination of bonds and the pre-trade SSTI of the first stage of the phase-in apply.

268. Article 17(4) of RTS 2 provides for ESMA to submit to the Commission an assessment of the operation of the thresholds for the liquidity determination of bonds and the trade percentiles determining the pre-trade SSTI-threshold by 30 July of each year, starting on 30 July 2019, until the final stage of the phase-in has been reached.

269. According to Article 17(5) of RTS 2 ESMA should take the following factors into account for such assessment:

- The evolution of trading volumes in non-equity instruments covered by the pre-trade transparency obligations;

- The impact on liquidity providers of the percentile thresholds used to determine the SSTI; and

- Any other relevant factors.

270. Where, based on this assessment, ESMA considers that the thresholds should be adjusted to the next stage, it should submit to the Commission an amended version of RTS 2.

271. Given the uncertainty on the timing and conditions of Brexit, ESMA did not carry out the first assessment in 2019 and those uncertainties unfortunately remain, having an impact on ESMA performing the RTS 2 review.

272. ESMA nonetheless intends to submit the first annual assessment of the phase-in regime to the Commission by 30 July 2020 after the first annual transparency calculations have been performed. At the time the UK is no longer subject to EU law a number of factors that cannot be taken into account at this stage can be considered more fully.

273. This CP addresses the following questions:

- Should the average daily number of trades used to determine if a bond has a liquid market be set to 10 as provided for at stage 2 instead of 15 as provided for at stage 1 (section 4.1.2)?

- Should the trade percentile to determine the SSTI pre-trade threshold be set to 40% as provided for at stage 2 instead of 30% as provided for at stage 1 for the following asset classes (section 4.1.3)?

4.1.2 Average daily number of trades for the determination of bond liquidity

A. Analysis

274. The quarterly liquidity assessment for bonds (except ETCs and ETNs) is currently performed on the basis of three parameters:

- Average daily notional amount greater or equal to EUR 100,000;

- Average daily number of trades greater or equal to 15;

- Percentage of days traded over the period considered greater or equal to 80%.

275. Under the phase-in, the parameters for the average daily notional amount and the percentage of days traded would remain unchanged, but the average daily number of trades would be gradually reduced from 15 trades/day under stage 1 to 2 trades/day under stage 4 (see Table 5). When moving from stage 1 to stage 2, the average daily number of trades would be reduced from 15 to 10.

TABLE 5 LIQUIDITY DETERMINATION OF BONDS (EXCEPT ETCS AND ETNS)

Average daily notional amount	**Average daily number of trades**				**% of days traded**
EUR 100 000	S1	S2	S3	S4	80%
	15	10	7	2	

276. The approach to determine the liquidity status of bonds on a quarterly basis for each bonds was chosen due to concerns that the liquidity status of bonds may be subject to abrupt changes due to the fact that many bonds have cyclical trading patterns, i.e. high

trading frequency shortly after issuance and when the bond comes close to maturity, whereas the trading frequency is often low throughout the remaining life cycle.

277. Table 6 below displays the number of bonds considered to be liquid in the liquidity assessments from 2018Q4 to 2019Q3. Most of the bonds classified as liquid are sovereign bonds, followed by corporate bonds. It can be seen that only very few bonds have been considered liquid (between 0.15% and 0.31% of total bonds).

278. Overall, it can be noted that there was a slight upward trend of liquid bonds but that, in parallel the number of total bonds also slightly increased, thereby resulting in an overall stable percentage of liquid bonds to total bonds. Overall, the number of liquid bonds falls below ESMA's expectations based on calculations carried out when calibrating the regime, which estimated that about 2% of bonds would be classified as liquid or about 2000 bonds. However, these expectations were based on different values of the thresholds for the liquidity parameters than those applied in stage 1.

TABLE 6 LIQUID BONDS PER BOND TYPE, 2018Q4-2019Q3

	2018Q4	2019Q1	2019Q2	2019Q3
Liquid	**439**	**987**	**594**	**611**
of which				
Convertible	-	18	1	-
Other public	22	44	27	38
Sovereign	279	553	381	404
Covered	-	-	-	3
Corporate	86	257	136	125
Other	20	40	27	26
Illiquid	297,224	316,854	320,198	320,085

Total	**297,663**	**317,841**	**320,792**	**320,696**
% of liquid bonds	0.15%	0.31%	0.19%	0.19%

Source: FITRS

279. Table 7 below displays the change of liquidity status of bonds from one quarter to the other (based on the current first stage of the phase-in).

280. In particular, on the left-hand side there are the starting quarters (Q4 2018, Q1 2019 and Q2 2019). On the right-hand side there are the following quarters (Q1 2019, Q2 2019 and Q3 2019 respectively). More specifically:

- o 397 bonds which were liquid in Q4 2018 remain liquid in Q1 2019 while 35 become illiquid and 7 are not published in Q1 2019. 428 bonds which were illiquid in Q4 2018 become liquid in Q1 2019 while 281,133 remain illiquid and 15,663 are not published in Q1 2019;

- o 479 bonds which were liquid in Q1 2019 remain liquid in Q2 2019 while 446 become illiquid and 62 are not published in Q2 2019. 46 bonds which were illiquid in Q1 2019 become liquid in Q2 2019 while 288,664 remain illiquid and 28,144 are not published in Q2 2019;

- o 461 bonds which were liquid in Q2 2019 remain liquid in Q3 2019 while 121 become illiquid and 12 are not published in Q3 2019. 89 bonds which were illiquid in Q2 2019 becomes liquid in Q3 2019 while 288,956 remain illiquid and 31,153 are not published in Q3 2019.

281. As can be seen, most bonds that have been determined as illiquid in one quarter, remain illiquid throughout the next quarter (90-95% of illiquid bonds). Furthermore, there is a volatility concerning the liquidity status of bonds determined as liquid from one quarter to the other (ranging from 48.5-90.4% of bonds staying liquid from one quarter to the other).

282. These statistics seem hence to confirm that many bonds remain only liquid for a short period of time and that it is therefore necessary to regularly reassess the liquidity status of bonds. It should be noted that the change of the liquidity status from one quarter to the next is also linked to the current stage of the phase in and that at a future stage of the phase in the results may differ. Moreover, it could be argued that a different methodology for the liquidity determination of bonds could be simpler to perform and may result in less volatility.

TABLE 7 CHANGE OF LIQUIDITY STATUS BONDS

		2019Q1		
		Liquid	**Illiquid**	**Excluded[34]**
2018Q4	**Liquid**	397	35	7
		90.4%	8.0%	1.6%
	Illiquid	428	281,133	15,663
		0.1%	94.6%	5.3%
		2019Q2		
		Liquid	**Illiquid**	**Excluded**
2019Q1	**Liquid**	479	446	62
		48.5%	45.2%	6.3%
	Illiquid	46	288,664	28,144
		0.0%	91.1%	8.9%
		2019Q3		
		Liquid	**Illiquid**	**Excluded**
2019Q2	**Liquid**	461	121	12
		77.6%	20.4%	2.0%
	Illiquid	89	288,956	31,153
		0.0%	90.2%	9.7%

Source: FITRS

Q25: Do you agree that the current quarterly liquidity calculation for bonds is appropriate or would you be of the view that the liquidity determination of bonds should be simplified and provide for more stable results? Please explain.

[34] Bonds could be excluded from the quarterly calculations because they do no longer pass the completeness test, because there has been a change in the status of the instrument (i.e. the instrument is no longer considered to be a bond or the bond is considered as a new bond and in consequence not subject to the quarterly calculations).

283. When simulating the impact of moving to stage 2 (S2) of the phase-in, ESMA also reperformed the determination of the liquidity status of bonds based on the current data available in FITRS under stage 1 (S1), i.e. including additional data submitted as well as modifications and cancellations of submitted data by reporting entities for the period Q4 2018 to Q3 2019. Table 8 compares the number of liquid bonds based on the actually published results at the time to the number of liquid bonds determined on the basis of the recalculation which uses updated data.

284. The following can be observed:

- The number of liquid bonds is lower in the recalculation for all quarters, in particular for the reference period 2019 Q2; and
- Not all bonds considered liquid in the recalculation were considered liquid in the actual publication, and vice versa.

285. There are a number of reasons explaining such differences:

- o Corrections on quantitative data performed after the quarterly bond liquidity assessment are taken into account under the re-calculations;
- o Corrections on reference data, including the start trading date or the classification of the instrument, performed after the quarterly bond liquidity assessment are taken into account under the re-calculations;
- o Corrections on the calendars for days open in a trading venue;
- o The difficulty to exactly replicate the calculation of the third parameter, i.e. the percentage of days traded, outside the IT system.

TABLE 8 NUMBER OF LIQUID BONDS – ACTUAL PUBLICATION VS. RECALCULATION UNDER S1

	2018Q4	2019Q1	2019Q2	2019Q3
A. Number of liquid bonds based on recalculation under S1 (15 average daily number of trades)	622	996	793	845
B. Number of liquid bonds published under S1 (15 average daily number of trades)	439	987	594	611
C. Number of liquid bonds based on recalculation (A) which are also liquid as per publication (B)	438	720	580	602

286. In order to determine the impact of a potential change to stage 2 ESMA has simulated how many bonds would have qualified as liquid, during the last four quarters (Q1, Q2, Q3 and Q4 2019), using an average number of daily trades equal to 10 (S2) instead of 15 (S1). Table 9 below compares the results under stage 1, i.e. the current phase, and stage 2, covering the EU28. ESMA also performed the same calculation for the EU27[35].

287. It can be noted that the move from stage 1 to 2 would on average increase the number of liquid bonds by about 50%, both for the EU28 (slightly above 50%) and the EU27 (slightly below 50%). From Table 10 below it can be seen that this increases the number of liquid bonds between 0.32% to 0.48% (in the EU28). Hence, the overall share of liquid bonds remains very modest also under stage 2.

288. When comparing the situation for the EU27 vs. EU28, it can be observed that the total number of liquid bonds, under both stage 1 and 2 are significantly lower for the EU27 (about 50-60% lower for both stage 1and 2). At the same time, it has to be noted that the total number of bonds in the EU27 is just less than 1% lower than in the EU28. Hence, in relative terms the share of liquid bonds compared to total bonds is even smaller for the EU27 compared to the EU28.

TABLE 9 BONDS LIQUIDITY STATUS UNDER S1 AND S2 - EU28 VS. EU27

	2018Q4	2019Q1	2019Q2	2019Q3
A. Num of liquid bonds in the EU 28 under S1	622	996	793	845
B. Num of liquid bonds in the EU 27 under S1	258	377	330	353
C. Difference in num of liquid bonds EU27-EU28 under S1 [B – A] **(%)**	-364 (-58.52%)	-619 (-62.15%)	-463 (-58.39%)	-492 (-58.22%)
D. Num of liquid bonds in	966	1515	1258	1310

[35] The EU27 calculations exclude ISINs admitted to trading/traded only on UK trading venues. Furthermore, for the ISINs admitted to trading/traded in the EU27 exclude the trading volume is calculated excluding trading activity executed on the UK trading venues, by UK SIs (and reported to any APA) and OTC volume reported to UK APAs.

the EU28 under S2				
E. Num of liquid bonds in the EU27 under S2	383	563	477	527
F. Difference in num of liquid bonds EU27-EU28 under S2 [E – D] **(%)**	-583 (-60.35%)	-952 (-62.84%)	-781 (-62.08%)	-783 (-59.77%)
G. Difference in the num of liquid bonds in the EU28 between S2 and S1 [D – A] **(%)**	344 (55.31%)	519 (52.11%)	465 (58.64%)	465 (55.03%)
H. Difference in the num of liquid bonds in the EU27 between S2 andS1 [E – B] **(%)**	125 (48.45%)	186 (49.34%)	147 (44.55%)	174 (49.29%)

Source: ESMA (FITRS)

TABLE 10 % OF LIQUID BONDS S1 VS S2, EU27 AND EU28[36]

	2018Q4	2019Q1	2019Q2	2019Q3
Percentage of liquid bonds (over total number of bonds in the EU28) in the EU28 under S1	0.21%	0.31%	0.25%	0.26%
Percentage of liquid bonds (over total number of bonds in the EU27) in the EU27 under S1	0.09%	0.12%	0.10%	0.11%
Percentage of liquid bonds (over total number of bonds in the EU28) in the EU28 under S2	0.32%	0.48%	0.39%	0.41%
Percentage of liquid bonds (over total number of bonds in the EU27) in the EU27 under S2	0.13%	0.18%	0.15%	0.16%

Source: ESMA (FITRS)

B. Conclusions and Proposals

289. The analysis in section 3.1 and 3.2 concluded that the current level of pre- and post-trade transparency is very low and mainly driven by the high share of illiquid instruments, including for bonds. The analysis therefore concluded that a higher share of liquid instruments would increase the level of pre- and post-trade transparency. The move from stage 1 to stage 2 for the liquidity assessment of bonds, would increase the level of transparency for bonds.

290. From the analysis above it appears that a move from stage 1 to stage 2 would increase the total number of liquid bonds by about 50%. At the same time, also under stage 2 only a very small share of total bonds would be considered liquid (0.32-0.48% of total bonds under stage 2 compared to 0.21-0.31% of total bonds under stage 1 in the EU28). Hence, the move from stage 1 to stage 2 would result in a very modest increase in the share of

[36] Percentages calculated on the basis of the number of liquid bonds identified with the recalculation.

liquid bonds and of the level of transparency. ESMA considers it unlikely that such a change would have negative market impact.

291. ESMA therefore recommends moving to stage 2 for the liquidity assessment of bonds.

Q26: Do you agree with ESMA proposal to move to stage 2 for the determination of the liquidity assessment of bonds? Please explain.

4.1.3 Trade percentile for the determination of the pre-trade SSTI threshold

A. Analysis

292. Article 17 of RTS 2 requires ESMA to assess by 30 July of each year if the percentile to be used for the pre-trade SSTI threshold shall be changed and set to the value provided for the following stage, in this case stage 2 for all non-equity instruments.

293. Considering that ESMA will provide the first annual transparency calculation for all non-equity instruments other than bonds in the following months, it is considered premature to assess whether it is appropriate to move to stage 2 for those instruments at this point in time.

294. Indeed, the completeness and the quality of the data were insufficient to perform the annual transparency calculations in the year 2019. ESMA has constantly worked with NCAs and reporting entities to improve data completeness and data quality in order to be able to perform such calculations in 2020. Furthermore, ESMA will have data related to the trading activity excluding the UK only in 2021 when UK market participants presumably will no longer report data to ESMA IT systems, the Financial Instruments Reference Data System (FIRDS) and the Financial Instruments Transparency System (FITRS). For all those reasons, ESMA considers that at this point in time it is not in a position to propose the move to the following stage for the pre-trade SSTI threshold for derivatives.

295. However, as far as bonds (excluding ETCs and ETNs) are concerned, ESMA already performed in 2019 the annual transparency calculations related to the determination of the pre- and post-trade LIS and SSTI thresholds.

296. Consequently, in order to determine if the value of the pre-trade SSTI threshold should be changed ESMA has simulated for bonds (excluding ETCs and ETNs) what would be the value of such threshold using 40% instead of 30% on the basis of data reported to FITRS in year 2018.

297. The results of the analysis are presented in Table 11 below. The increase in value is relevant mainly for sovereign bonds and covered bonds. Considering that both types of bonds usually trade in big sizes, it seems to be appropriate to move to stage 2.

TABLE 11 PRE-TRADE SSTI THRESHOLDS

Bond Type	**Results of annual calculations published in 2019 (data of year 2018) SSTI pre-trade_30%**	**Simulation (data of year 2018) SSTI pre-trade_40%**
Corporate Bond	300,000	500,000
Convertible Bond	400,000	700,000
Other Public Bond	300,000	600,000
Covered Bond	600,000	1,500,000
Sovereign Bond	600,000	1,500,000
Other Bond	300,000	500,000

B. Conclusions and Proposals

298. In conclusion, ESMA proposes for SFPs, interest rate derivatives, commodity derivatives, credit derivatives, C10 derivatives, CFDs, emission allowances and emission allowance derivatives not to move to stage 2 for the determination of the pre-trade SSTI threshold.

299. As far as bonds (excluding ETCs and ETNs) are concerned, ESMA proposes to move to stage 2.

Q27: Do you agree with ESMA proposal not to move to stage 2 for the determination of the pre-trade SSTI thresholds for all non-equity instruments except bonds? Please explain.

Q28: Do you agree with ESMA proposal to move to stage 2 for the determination of the pre-trade SSTI thresholds for bonds (except ETCs and ETNs)? Please explain.

4.2 RTS 2 review for commodity derivatives[37]

4.2.1 Liquidity determination for commodity derivatives contracts

A. Analysis

300. Having received feedback from various stakeholders related to the specificities of the commodity derivatives markets and how they should be taken into consideration in RTS 2, ESMA is taking the opportunity of this review report to address those concerns.

301. Stakeholders have argued in particular that revisions would be necessary in relation to (1) the methodology to determine whether a commodity derivative contract has a liquid market or not; and (2) the level of the pre-trade LIS threshold for liquid commodity derivatives contracts.

302. Those two elements are relevant in the context of the waivers from pre-trade transparency as they determine the contracts which are eligible to the illiquid waiver under Article 9(1)(c) of MiFIR, and the LIS waiver under Article 9(1)(a) of MiFIR.

303. The changes proposed in this section of the paper are without prejudice to the proposals raised by ESMA on reviewing the Level 1 text. ESMA is working under the assumption that any review of RTS 2 can be performed and implemented ahead of any change of the Level 1.

304. RTS 2 (Annex III, Table 7.1) sets out that commodity derivatives contracts are deemed to have a liquid market when the average daily notional amount (ADNA) is greater than EUR 10M and the average daily number of trades (ADNT) is greater than 10. ESMA notes that, whilst the parameters for the ADNA and ADNT could in principle be set at different levels for different sub-asset classes (e.g. the one for "Metal commodity swaps" could be different than the one for "Energy commodity futures/forwards"), they are currently set in RTS 2 at the same level for all sub-asset classes.

305. The liquidity determination further depends on the choice of so-called "segmentation criteria", which are different in number and nature for each sub-asset class. The segmentation criteria define the way in which the contracts are aggregated into smaller subsets called "sub-classes". The liquidity determination is then performed at the sub-class level. All contracts in the same sub-class have the same liquidity determination (liquid or illiquid) and the same threshold values (pre- and post-trade LIS and SSTI).

306. ESMA notes that the system as it currently exists provides for an adequate level of flexibility, with a number of different segmentation criteria and the possibility to set different levels of ADNA, ADNT for different sub-asset classes. However, ESMA also reckons that such flexibility might not have been used so far in the most efficient manner.

[37] C10 derivatives are not tackled in this section

307. Indeed, structural differences between different commodity derivatives markets may support that the ADNA and ADNT are set at different levels depending on the underlying instruments. Likewise, the segmentation criteria might currently lead to very granular classes in some cases, and rather broad classes in other cases (with the potential result of mixing unrelated contracts in the same class).

308. This effect has already been identified for certain energy derivatives, where insufficient guidance was provided in relation to the population of a particular segmentation criterion ("Delivery/Cash settlement location", which is based on Field 14 of Table 2 of Annex IV of RTS 2). This led to inconsistent reporting and the resulting aggregation of multiple and unrelated contracts in the same class. As further explained in the next section ESMA is making some proposals to address this issue.

B. Conclusions and Proposals

Proposals in relation to the liquidity determination – ADNA and ADNT

309. Currently, the ADNA and ADNT are set at the same level for all commodity derivatives (ADNA = EUR10M and ADNT = 10 trades). There could be cases where those parameters might merit a recalibration, e.g. for certain energy sub-asset classes, the ADNT set at 10 trades might be too low and might lead to an inappropriate determination of classes "having a liquid market" (as illustrated in the next section 4.2.2).

310. Therefore, ESMA's current proposal is to examine the possibility to modify in RTS 2 the levels of the ADNA and ADNT for the various sub-asset classes. To the extent possible, the new parameters should take into account the results of the transparency calculations for derivatives which are intended to be published by ESMA in 2020 based on data for the year 2019.

311. ESMA is asking stakeholders to provide a general evaluation of the current calibration as per the question below.

Q29: What is your view on the current calibration of the ADNA and ADNT for commodity derivatives? Are there specific sub-asset classes for which the current calibration is problematic? Please justify your views and proposals with quantitative elements where available.

Proposals in relation to the liquidity determination – segmentation criteria

312. First, ESMA suggests that the segmentation criteria "delivery/cash settlement location" should apply to all commodity derivatives contracts where the geographical delivery location is relevant, rather than being limited to the sub-set currently set in RTS 2 (i.e. currently, the field is only applicable to the energy types oil, oil distillates, oil light ends, electricity and inter-energy while it is not applicable to the energy types natural gas, coal and renewable energy, nor to metals and agricultural contracts). Indeed, it would appear reasonable that this segmentation criterion is used consistently for all commodity

derivatives, and in particular for gas contracts which function in a similar way as electricity contracts.

313. Second, in relation to the way in which the field should be populated, ESMA suggests that when a standard already exists (such as the EIC Y code for electricity and gas contracts[38]), this standard should be used. At the moment, in the TTC, the EIC Y code is used only for electricity but not for gas contracts.

314. To that effect, the standard where available should be specified in the legislation (Field 14 of Table 2 of Annex IV of RTS 2).

315. When such standard does not exist, ESMA and NCAs should work closely with trading venues to determine an efficient and consistent way to populate this field, which could then be implemented via Level 3 measures or reporting instructions. This approach would prove relatively flexible, as it could be modified in the future depending on possible market developments. ESMA and NCA could also determine that in specific cases, the field should be left blank, which would result in the segmentation criterion not playing a role.

316. In addition, ESMA notes that the segmentation criterion “settlement type” (cash, physical or other) is currently used only for the sub-asset class “Energy commodity swaps” while it could be argued that the same segmentation criterion should also apply to “Energy commodity futures/forwards” and “Energy commodity options” as this is an important feature of energy contracts and is defined in the contract specifications. Hence ESMA suggests that the segmentation criterion “settlement type” is added to the sub-asset classes “Energy commodity futures/forwards” and “Energy commodity options”.

317. The proposals related to segmentation criteria are summarised below (they are not mutually exclusive):

- Proposal SC1: apply the segmentation criterion “delivery/cash settlement location” to all commodity derivatives;

- Proposal SC2: define in RTS 2, to the extent possible, the standards to report the field “delivery/cash settlement location” (e.g. EIC Y code for electricity and gas contracts);

- Proposal SC3: apply the segmentation criterion “settlement type” to all energy sub-asset classes;

318. All proposals require a change to RTS 2.

[38] The EIC C Y code for electricity and gas contracts corresponds to the delivery point of the market area. As per the EIC reference manual available on the entso-e website, “the EIC code of type Y is used to identify a domain which can be considered as a delimited area that is uniquely identified for a specific purpose and where energy consumption, production or trade may be determined. It can be a geographical or market area, such as control areas, balance groups, bidding zones, balancing areas, etc.”
The list of relevant EIC Y codes for each standard contract is maintained and published by ACER on the REMIT Portal at this link

Q30: In relation to the segmentation criteria used for commodity derivatives: what is your view on the segmentation criteria currently used? Do you have suggestions to amend them? What is your view on ESMA's proposals SC1 to SC3? In your view, for which sub-asset classes the "delivery/cash settlement location" parameter is relevant?

4.2.2 Level of pre-trade LIS thresholds for commodity derivative contracts

A. Analysis

319. Stakeholders have argued that, on the basis of the results of the transitional transparency calculations (TTC), the pre-trade LIS thresholds have been set at levels which are too high for the "least liquid" contracts having a liquid market. Stakeholders have noted, in particular, that the pre-trade LIS thresholds tended to be higher for less liquid than for very liquid contracts. Whilst it would appear more logical that LIS thresholds are higher for the most liquid contracts, the current methodology was claimed to lead to the opposite and somehow counterintuitive effect.

320. Using the TTC data, ESMA has further analysed the relation between the pre-trade LIS thresholds and the liquidity of the classes, as measured by the ADNT, for various classes deemed to have a liquid market. For some sub asset-classes (e.g. agricultural options), the number of liquid classes was too low to allow for a proper analysis. However, for the sub asset-classes presented below (energy futures in Figure 32, energy options in Figure 33, metal futures in Figure 34 and agricultural futures in Figure 35), the data shows that high values of LIS thresholds are observed for the classes where the ADNT is the lowest (typically less than 100), while for classes with the highest ADNT, the LIS values are lower, and in many cases equal to the floor[39].

[39] To recall, as per Article 13(2)(b)(ii) of RTS 2, the pre-trade LIS threshold for commodity derivatives is the highest of (1) the 70% percentile; and (2) the threshold floor (which is currently set at 500,000 EUR for all commodity derivatives).

In the figures below, each point represents one liquid sub-class, belonging to a specific sub-asset class.

FIGURE 32: ENERGY FUTURES – PRE-TRADE LIS THRESHOLD AS A FUNCTION OF ADNT

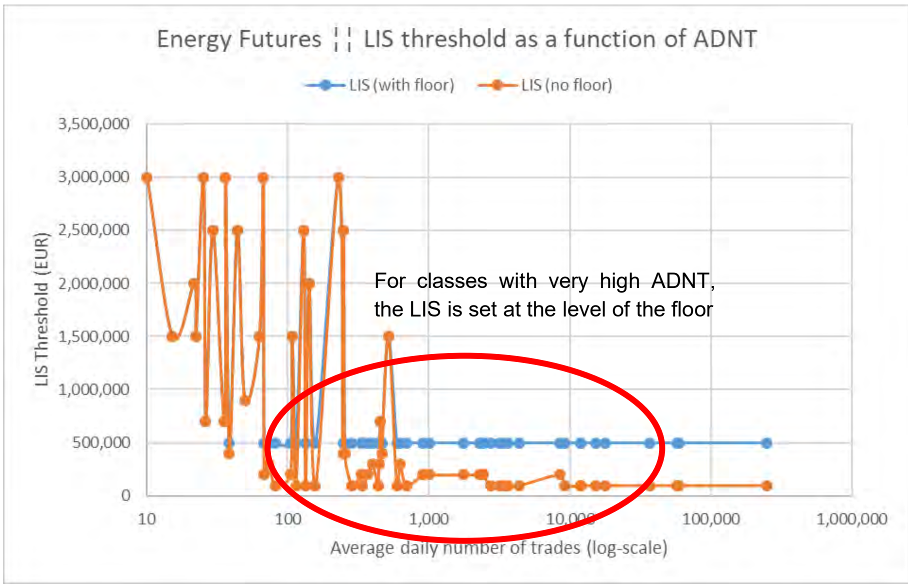


FIGURE 33: ENERGY OPTIONS – PRE-TRADE LIS THRESHOLD AS A FUNCTION OF ADNT

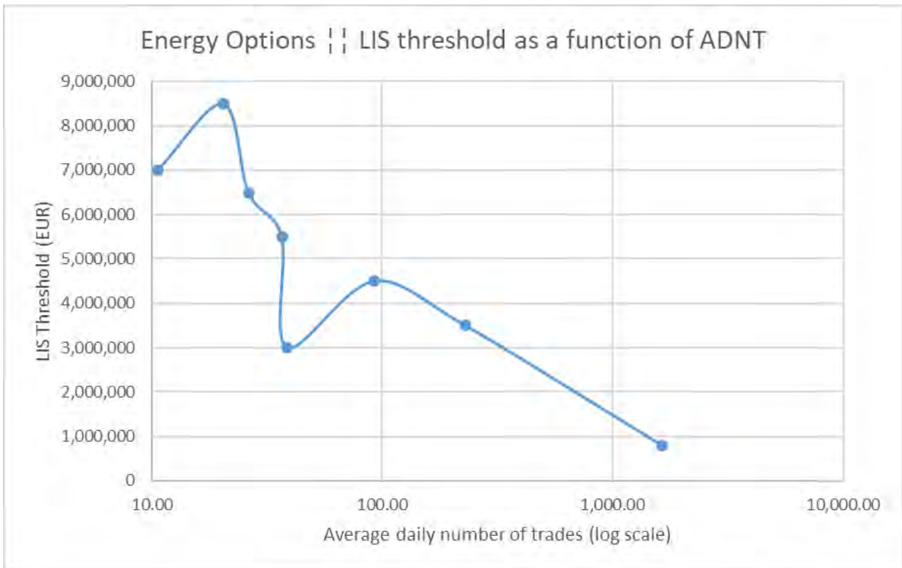


FIGURE 34: METAL FUTURES – PRE-TRADE LIS THRESHOLD AS A FUNCTION OF ADNT

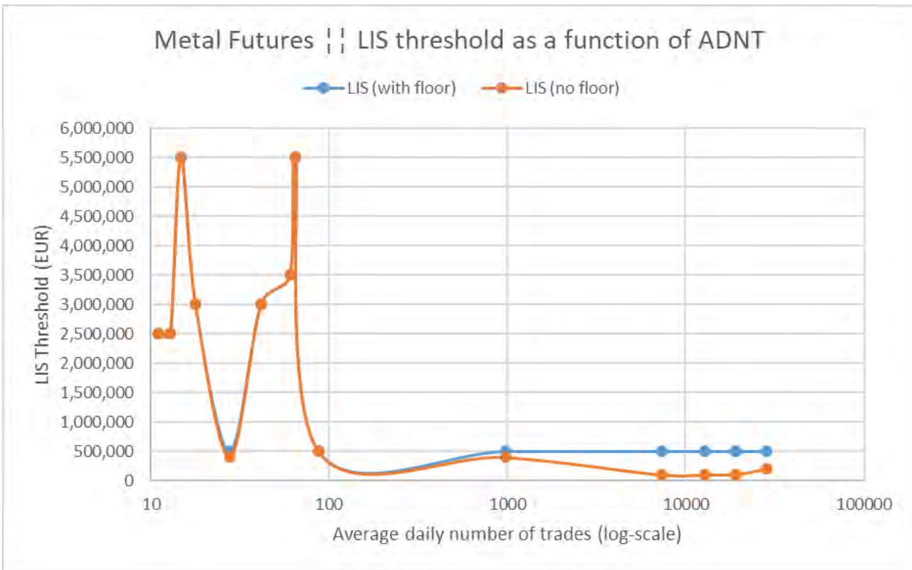
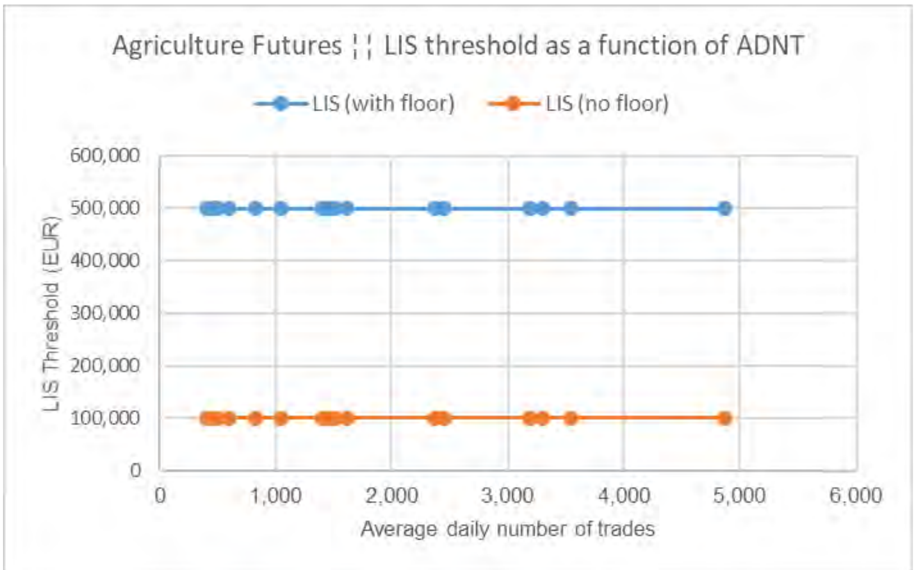


FIGURE 35: AGRICULTURAL FUTURES – PRE-TRADE LIS THRESHOLD AS A FUNCTION OF ADNT



321. This observation appears at odds with the expected policy outcome, which would rather be that the LIS threshold is higher for the most liquid contracts. To understand the reason behind the current relation between the LIS threshold and the ADNT better, it is necessary to examine in more detail the distribution of the trades pertaining to specific liquid classes.

322. For illustration purposes, below are presented the distribution functions of two typically "less liquid" classes (Class #31 in Figure 36 and Class #11 in Figure 37) and two typically "very liquid" classes (Class #16 in Figure 38 and Class #32 in Figure 39), where the concept of liquidity is based on the ADNT. This is only a small sample, but very similar

patterns of distributions have been observed for the other classes not presented below, both in the case of less liquid, and very liquid classes, i.e.:

— For "less liquid" classes (e.g. Class #31 in Figure 36 and Class #11 in Figure 37)

323. There are only a few small trades and liquidity clusters around specific trade sizes. There are some "jumps" in the distribution. The rounding methodology defined in Article 13(12) of RTS 2[40] can have a large impact on the level of the LIS threshold, depending on where those jumps occur in the distribution of trades.

324. As can be seen in Figure 37, the relatively large bin size[41] (EUR 500,000 as defined in accordance with the rounding methodology) leads to a significant difference between the threshold supposed to be retained (70th percentile) and the one retained in practice (93th percentile). For this class, a more granular rounding methodology (hence a smaller bin size) would lead to a more accurate determination of the 70th percentile, and to a lower LIS threshold.

— For "very liquid" classes (e.g. Class #16 in Figure 38 and Class #32 in Figure 39)

325. The distributions exhibit a lot of small trades and more than 70% of the trades generally occur within the first bin [0 – 100,000]. For those classes, the size of the first bin (EUR 100,000 as defined in accordance with the rounding methodology) leads to a significant difference between the threshold supposed to be retained (70th percentile) and the one retained in practice (e.g. 85th percentile for Class #16). Hence a more granular rounding methodology for the first bin would lead to a more accurate determination of the 70th percentile.

326. This effect is however superseded by the effect of the floor: since the 70th percentile generally corresponds to the first bin (100,000 EUR) which is lower than the pre-trade LIS floor, the floor is used in most cases (see also the circled part of Figure 32). This means that for those classes, the level of the pre-trade LIS threshold corresponds to a large trade percentile (e.g. 97.4th for Class #16 and 96.6th for Class 32). Please refer to Box 1 below for further explanations on the methodology to calculate the LIS threshold.

BOX 1: METHODOLOGY TO DETERMINE THE PRE-TRADE LIS THRESHOLD

The methodology used to determine the pre-trade LIS threshold for commodity derivatives is defined in Article 13(2)(a)(v) of RTS 2 for classes not having a liquid market, and in Article 13(2)(b)(ii) of RTS 2 for classes having a liquid market.

For commodity derivatives not having a liquid market, the pre-trade LIS threshold follows a static determination: the pre-trade LIS threshold is equal to a value defined in Table 7.3 of

[40] To determine the 70th percentile according to the rounding methodology defined in Article 13(12) of RTS 2, trades are grouped according to their volume (in EUR) into the following bins: size bin = 100,000 until 1M, size bin = 500,000 until 10M; size bin = 5M until 100M, size bin = 25M after.

[41] To determine percentiles, trades are grouped according to their volume in so-called "bins". The sizes of those bins are defined according to the rounding methodology set in Article 13(12) of RTS 2: size bin = 100,000 until 1M, size bin = 500,000 until 10M; size bin = 5M until 100M, size bin = 25M after.

Annex III of RTS 2. Currently, this value is equal to 500,000 EUR for all commodity sub-asset classes.

For commodity derivatives having a liquid market, the threshold shall be the greater of (1) the trade size below which falls the percentage of the transactions corresponding to a defined trade percentile; and (2) the threshold floor. The parameters to be retained for the thresholds floor and the trade percentile are defined in Table 7.2 of Annex III of RTS 2. Currently, those parameters are equal to 70th for the trade percentile, and 500,000 EUR for the threshold floor, for all commodity sub-asset classes.

$$PreTrade\ LIS(commo) = \max(threshold\ floor, trade\ percentile) = \max\,(EUR\ 500{,}000, 70^{th} percentile)$$

The 70th percentile represents the trade size (in EUR) below which 70% of the transactions fall. If this value is smaller than the floor (EUR 500,000), the LIS threshold is set at the level of the floor. In this case, the LIS threshold will correspond to a trade percentile higher than the 70th. Example: for a theoretical class, 70% of the transactions are lower than 100,000 EUR and 90% of the transactions are lower than 500,000 EUR. Then the 70th percentile is equal to 100,000 EUR, and the LIS threshold is equal to the floor (500,000 EUR) which corresponds to the 90th percentile.

FIGURE 36: DISTRIBUTION OF A "LESS LIQUID" CLASS (ADNT = 10)

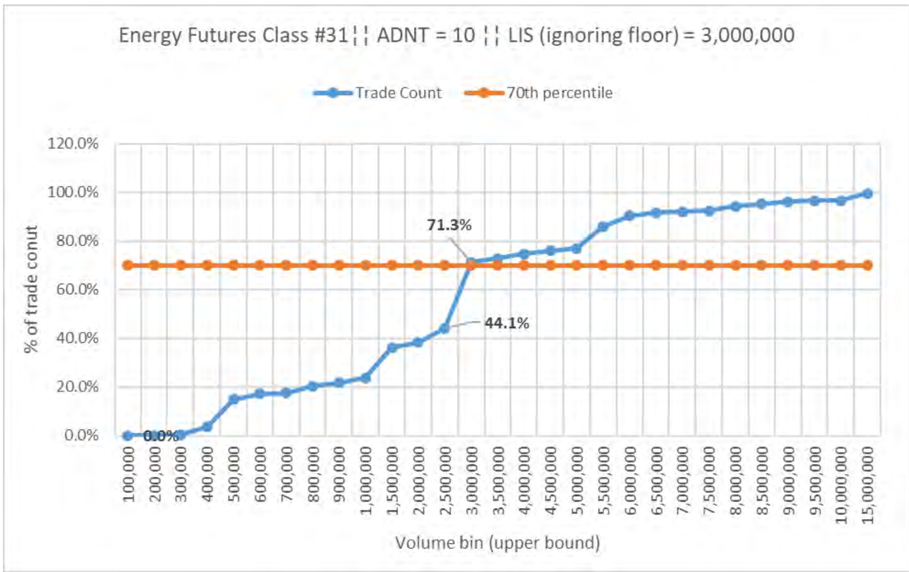


FIGURE 37: DISTRIBUTION OF A "LESS LIQUID" CLASS (ADNT = 15)

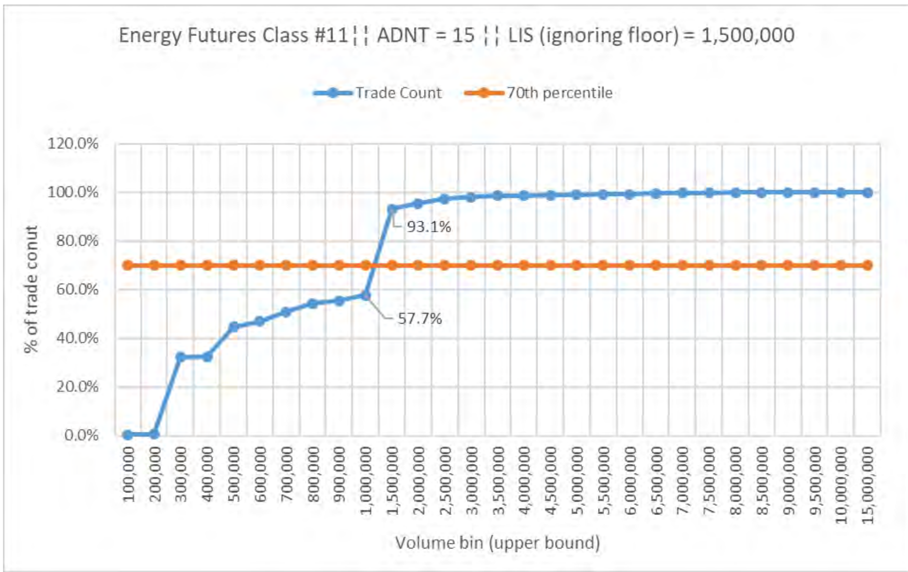


FIGURE 38: DISTRIBUTION OF A "VERY LIQUID" CLASS (ADNT ~ 250,000)

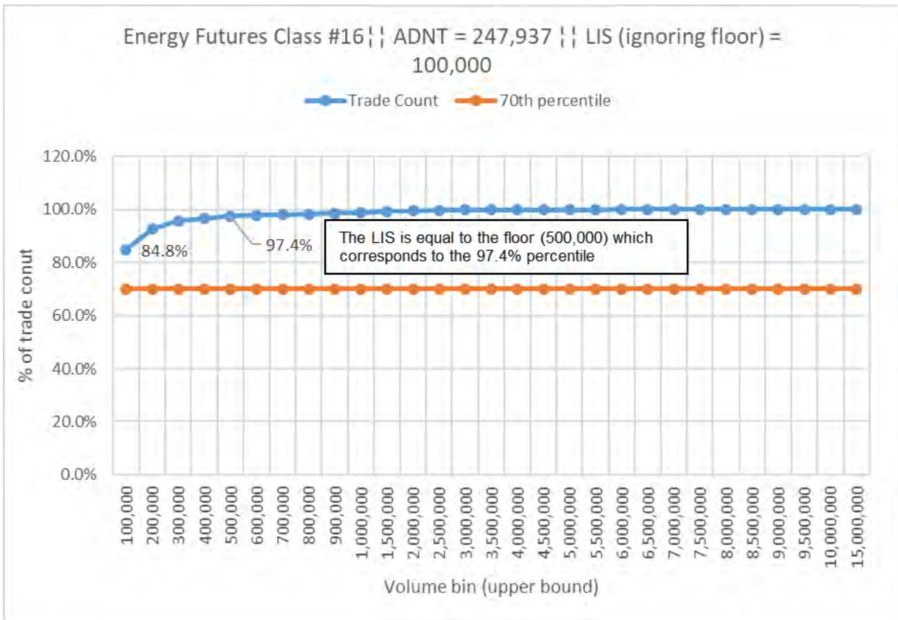
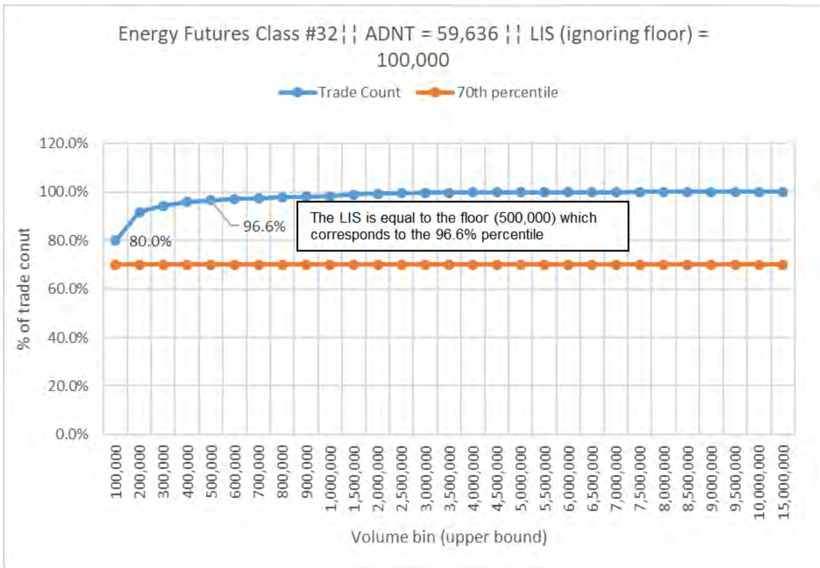


FIGURE 39: DISTRIBUTION OF A "VERY LIQUID" CLASS (ADNT ~ 60,000)



B. Conclusions and proposals

327. It appears that the current methodology based on percentiles and threshold floors, which determines the level of the pre-trade LIS threshold for liquid classes, leads by construction to higher thresholds for less liquid classes, which was not the initial intention of the regulation.

328. ESMA first notes that this issue could at least be partially addressed by implementing some of the proposals described under Section 4.2.1: supposing that sub-classes are constructed in a more efficient way, that liquid and illiquid instruments are not unintentionally commingled together in the same sub-class because of inappropriate segmentation criteria, and that ADNA and ADNT are calibrated in such a way that the classes having a liquid market are adequately identified, there should be less cases of "less liquid classes" exhibiting the type of distribution illustrated in Figure 36 and in Figure 37 above.

329. Should those measures not be sufficient, two possible routes could be envisaged to further resolve the issue. On the one hand, as suggested in the past by a number of stakeholders, the methodology could be modified to eliminate the above-mentioned counterintuitive effect, by using different metrics for the quantitative liquidity criteria.

330. This means that, instead of using the ADNA and ADNT, other metrics would be used. In relation to the ADNA, the current methodology based on notional amounts in EUR has the merits of being easy to calculate and being denominated in the same unit across all instruments. It has however been criticised because notional amounts are influenced by prices and possibly currency fluctuations - a significant price increase would lead to an increased ADNT even though the market liquidity remains unchanged.

331. In addition, the ADNA fails to make a proper distinction between (1) a market with on average few trades of large sizes (potentially illiquid); and (2) a market with on average numerous trades of small sizes (potentially liquid). Those two markets could have the exact same average daily notional amounts while exhibiting different liquidity profiles. In this respect, the use of standard trade size denominated in a unit that is native to the underlying commodity (e.g. MW, barrels, tons) would allow for a more accurate reflection of market liquidity.

332. Although ESMA acknowledges the merits of using alternative quantitative liquidity criteria from a theoretical point of view, it would be a substantial departure from the current methodology. This would create significant changes for market participants relatively shortly after implementation of MiFID II and it would also have a major impact on ESMA's IT systems (which have only recently been developed and are still under evolution based on the current state of the legislation) with the associated costs on reporting entities, NCAs and ESMA.

333. As a result, it is not ESMA's preferred option at this stage to modify the quantitative liquidity criteria (e.g. by using the average trade size denominated in the underlying's native unit instead of using the ADNA denominated in EUR)

334. Instead, it appears possible to mitigate the counterintuitive effect of the current percentile approach by changing its current parameters, i.e. the level of the percentile, the level of the pre-trade LIS threshold floor and/or the rounding of the thresholds for values greater than EUR 100,000 (referred to in Article 13(12) of RTS 2). Such approach could be implemented at a more reasonable cost. Those proposals require a change to RTS 2.

335. Therefore, ESMA's current proposal is to examine the possibility to modify in RTS 2 the parameters which are relevant to determine the pre-trade LIS thresholds i.e. the level of the percentiles, the level of the pre-trade LIS threshold floors and/or the rounding of the thresholds. To the extent possible, the new parameters should take into account the results of the transparency calculations for derivatives which are intended to be published by ESMA in 2020 based on data for the year 2019. ESMA is asking stakeholders to provide a general evaluation of the current calibration as per the question below.

Q31: What is your view on the analysis and proposals related to the pre-trade LIS thresholds for commodity derivatives? Which proposal to mitigate the counterintuitive effect of the current percentile approach do you prefer (i.e. keep the current methodology but modify its parameters, or change the methodology e.g. using a different metric for the liquidity criteria)? Please justify your views and proposals with quantitative elements where available.

5 Annexes

5.1 Annex 1

Summary of questions

Q1: What benefits or impacts would you see in increased pre-trade transparency in the different non-equity markets? How could the benefits/impacts of such pre-trade transparency be achieved/be mitigated via changes of the Level 1 text?

Q2: What proposals do you have for improving the level of pre-trade transparency available? Do you believe that the simplification of the regime for pre-trade transparency waivers would contribute to the improvement of the level of pre-trade transparency available?

Q3: Are you supportive of ESMA's proposal to delete the pre-trade SSTI-waiver? Would you compensate for this by lowering the pre-trade LIS-thresholds across all asset classes or only for selected asset classes? What would be the appropriate level for such adjusted LIS-thresholds? If you do not support ESMA's proposal to delete the pre-trade SSTI-waiver, what should be the way forward on the SSTI-waiver in your view?

Q4: What are your views on the use of the SSTI for the SI-quoting obligations. Should it remain (Option 1) or be replaced by linking the quoting obligation to another threshold (e.g. a certain percentage of the LIS-threshold) (Option 2)? Please explain.

Q5: Would you support turning the hedging exemption into a limited negotiated trade waiver? If so, would you support Option 1 or Option 2? If not, please explain why.

Q6: Do you agree with ESMA's observations on the emergence of new trading systems and the proposed way forward requiring a Level 1 change and ESMA to issue an Opinion for each new trading system defining its characteristics and the transparency requirements? Would you have suggestions for the timeline and process of such Opinions? Please explain.

Q7: Do you agree with the proposal for the definition of hybrid system? Are there in your view trading systems currently not or not appropriately covered in RTS 2 on which ESMA should provide further guidance? Please explain.

Q8: Do you agree with ESMA's proposal to require SIs to make available data free of charge 15 minutes after publication? Please explain.

Q9: Would you see value in further standardising the pre-trade transparency information to increase the usability and comparability of the information? Please explain.

Q10: Do you agree with ESMA's assessment of the level of post-trade transparency and with the need of a more streamlined and uniform post-trade regime which does not include options at the discretion of the different jurisdictions? If not, please explain why and, where available, support your assessment with data.

Q11: Do you agree with this proposal? What would be the appropriate level of such a revised LIS-threshold in your view?

Q12: In your view, should the real time publication of volume masking transactions apply to transactions in illiquid instruments and above LIS waiver (Option 1) or to transactions above LIS only (Option 2 and Option 3). Please elaborate. If you support another alternative, please explain which one and why.

Q13: Do you agree with the publication of the price and volume of all transactions after a certain period of time, such as two calendar weeks (Option 1 and 2) or do you support the two-steps approach for LIS transactions (Option 3)? Please explain why and provide any alternative you would support. Which is the optimal option in case a consolidated tape would emerge in the future?

Q14: Do you agree with ESMA's proposed way forward to issue further guidance and put a stronger focus on enforcement to improve the quality of post-trade data? Are there any other measures necessary at the legislative level to improve the quality of post-trade data? What changes to the transparency regime in Level 1 could lead to a substantial improvement of data quality?

Q15: What would be the optimal transparency regime to help with the potential creation of a CTP?

Q16: Do you agree with ESMA's above assessment? If not, please explain.

Q17: Are you of the view that the interpretation of TOTV should remained aligned for both transparency and transaction reporting? If not, please explain why.

Q18: Which of the three options proposed, would you recommend (Option 1, Option 2 or Option 3)? In case you recommend an alternative way forward, please explain.

Q19: What is your view on the proposal to delete the possibility for temporarily suspending the transparency provisions? Please explain.

Q20: Do you have any remarks on the assessment of Article 28 of MiFIR? Please explain.

Q21: Do you have any views on the above-mentioned criteria and whether the criteria are sufficient and appropriate for assessing the liquidity of derivatives? Do you consider it necessary to include further criteria (e.g. currency)? Do you consider that

ESMA should make use of the provision in Article 32(4) for asset classes currently not subject to the trading obligations? Please explain.

Q22: Do you agree that a procedure for the swift suspension of the trading obligation for derivatives is needed? Do you agree with the proposed procedure? Please explain.

Q23: Do you have a view on this or any other issues related to the application of the DTO?

Q24: Do you have any views on the functioning of the register? Please explain.

Q25: Do you agree that the current quarterly liquidity calculation for bonds is appropriate or would you be of the view that the liquidity determination of bonds should be simplified and provide for more stable results? Please explain.

Q26: Do you agree with ESMA proposal to move to stage 2 for the determination of the liquidity assessment of bonds? Please explain.

Q27: Do you agree with ESMA proposal not to move to stage 2 for the determination of the pre-trade SSTI thresholds for all non-equity instruments except bonds? Please explain.

Q28: Do you agree with ESMA proposal to move to stage 2 for the determination of the pre-trade SSTI thresholds for bonds (except ETCs and ETNs)? Please explain.

Q29: What is your view on the current calibration of the ADNA and ADNT for commodity derivatives? Are there specific sub-asset classes for which the current calibration is problematic? Please justify your views and proposals with quantitative elements where available.

Q30: In relation to the segmentation criteria used for commodity derivatives: what is your view on the segmentation criteria currently used? Do you have suggestions to amend them? What is your view on ESMA's proposals SC1 to SC3? In your view, for which sub-asset classes the "delivery/cash settlement location" parameter is relevant?

Q31: What is your view on the analysis and proposals related to the pre-trade LIS thresholds for commodity derivatives? Which proposal to mitigate the counterintuitive effect of the current percentile approach do you prefer (i.e. keep the current methodology but modify its parameters, or change the methodology e.g. using a different metric for the liquidity criteria)? Please justify your views and proposals with quantitative elements where available.