

A CRITIQUE OF THE REGULATION OF GUARANTEE SYSTEMS OPERATED BY CENTRAL COUNTERPARTIES¹

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ABSTRACT

A properly functioning financial market infrastructure is indispensable for smooth market transactions. For this reason, regulatory authorities are putting increased emphasis on its regulation, in both a Hungarian and an international context. This study aims to analyse the regulation on central counterparties, one of the constituent institutions of that infrastructure, in the light of the guarantee systems they operate. The role of central counterparties on the market is to take over counterparty risk from market participants. They operate a complex guarantee system for this purpose, regulated by the EMIR regulation currently in force. The study highlights deficiencies and professional inaccuracies in the provisions of the legislation on guarantee systems in terms of practical application or methodology. The analysis is based on an interview with an expert and the relevant literature.

JEL codes: G15, G18, G23, G28

Keywords: central counterparty, PFMI, EMIR, guarantee system

1 INTRODUCTION

A smoothly functioning financial market infrastructure (FMI) is indispensable for every economy as it is the guarantee for seamless transactions in both the real economy and the financial sector. Financial market infrastructures are national and international systems, including the legal entities operating them, which facilitate the completion, clearing, settlement and recording of monetary transactions, such as payment, securities and other financial transactions between participants of these systems (CPSS-IOSCO, 2012). *Bernanke* (2009) used the term for payment and settlement systems or the ‘financial plumbing’, as he called them. In

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any economy, the financial market infrastructure is a complex system of several different institutions, composed of the following main building blocks:

- 1) payment systems (PS),
- 2) central securities depositories (CSD),
- 3) central counterparties (CCP),
- 4) securities settlement systems² (SSS) and
- 5) trade repositories (TR).

The institutions carrying out these activities are collectively referred to as systematically important payment systems (SIPS)³ (BIS, PFMI, 2017).

In Hungary, the operation of the financial market infrastructure is based on the following key institutions (MNB, 2017):

Clearing:

- Interbank Clearing System (ICS) GIRO: direct debit and credit transfer transactions
- Payment card clearing systems: domestic payment card transactions
- Postal Clearing Centre (PCC): postal inpayment to payment account
- CLS: FX transactions settled in CLS (HUF leg)
- KELER Group (CCP): OTC market, spot stock exchange and derivative stock exchange transactions

Settlement:

- MNB proprietary home accounting system (GIRO)
- VIBER (GIRO, card transactions, PCC, CLS, KELER Group)
- KELER (CSD – settlement)
- T2S (TARGET2-Securities)

While FMIs contribute to promoting financial stability in the economy as a whole and to seamless transactions, they also concentrate substantial risk. For example, in the event of shocks they may be sources of illiquidity and increased credit risk (PFMI, 2012). Accordingly, the activities of all participants, i.e. SIPS have a major

² In practice, the functions of securities settlement systems and central securities depositories are often integrated and performed by the same institution.

³ In a broader European interpretation, SIPS only include systematically important payment systems at EU level.

systemic impact on the economy and as such should be subject to proper regulation and oversight. This study focuses on central counterparties among SIPS, as institutions concentrating risk, with the aim to assess the practical effectiveness of the regulatory provisions on their guarantee systems and the underlying considerations of risk mitigation as well as to identify areas where the regulation should be clarified or possibly relaxed. This study does not aim, however, to explain regulations applicable to this complex institution exhaustively.

The main task of the subject of our analysis, i.e. central counterparties (hereinafter: 'CCPs') is to settle transactions on regulated capital markets and take over counterparty risk from market participants through the guarantee arrangements they offer. In case of default, these guarantee arrangements provide assurance to the non-defaulting party that the transaction will still be completed. To be able to take over counterparty risk from market participants effectively, CCPs must have a multi-level guarantee system in place. This, however, involves major risks. The structure of the study is as follows: in the 2. section, the development of the regulation on CCPs' activities is presented, followed by criticism in the literature and on our part in the 3. section. The study is concluded by a summary in the 4. section.

2 THE DEVELOPMENT OF THE REGULATION ON CENTRAL COUNTERPARTIES

Compared to the actual emergence of CCPs, a corresponding legal framework was established relatively late, only in 2010 when the Dodd-Frank Act⁴ was adopted in the United States, which was followed by the EMIR⁵ in Europe in 2012. In their study, *Biedermann and Orosz (2015)* compare differences and similarities between the two regulations. This study concerns the latter, i.e. the European regulation.

As mentioned in the Introduction, the primary purpose of CCPs is to manage counterparty risk. Setting up an institution of this kind was therefore in the interest of market participants. This is still reflected in the ownership structure of CCPs in a number of developed countries, where members are at the same time owners of the CCP.

In view of the primary objective of reducing counterparty risk, market participants developed risk-mitigation methods and models which were best suited to address counterparty risk and also exposure due to risk concentration in the CCPs. We could also say that the risk management practices and methods of CCPs developed organically over the years.

4 Dodd-Frank Wall Street Reform and Consumer Protection Act

5 European Market Infrastructure Regulation – Regulation (EU) No 648/2012

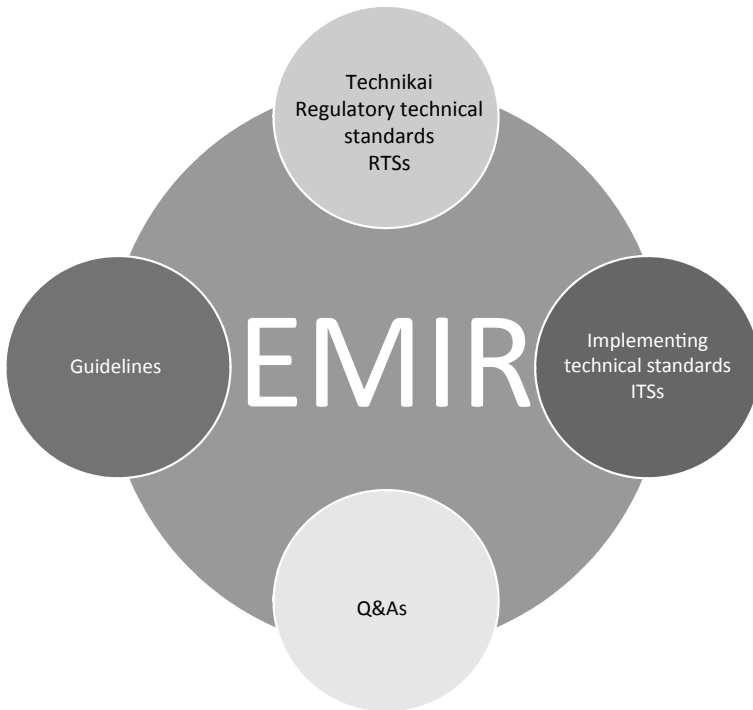
The first international recommendation concerning CCPs and in particular their role in risk integration was published under the title RCCP (Recommendation for Central Counterparties) in November 2004. It was based on previous recommendations for SSSs and industry best practices. The document put forward a total of 15 recommendations which addressed risks associated with the activities of CCPs (PFMI, 2012). A connection can be made between the publication of the recommendations and the 1990 Lámfalussy report, considering that one of the main focus of oversight by central banks emerging as a result of the report was and continues to be risk concentration in CCPs. In this respect, the publication of the international recommendations marked the appearance of a uniform set of operative criteria, which central banks tried to enforce by moral suasion and regulatory instruments at local level. In other words, it was left to national authorities and the institutions to decide how the recommendations should be complied with and applied as well as to ensure the same (*Swift*, 2017).

The operation of CCPs and in particular its regulation was no major concern for legislators until the financial crisis of 2008. However, an analysis of the crisis and its course revealed that while transactions and the associated exposure settled through a CCP could be closed relatively quickly and, most importantly, successfully, that was not the case for so called OTC (over-the-counter) transactions, the volume of which could not even be estimated back then. That failure resulted in significant cross-country contagion. G20 leaders at the Pittsburgh summit of 2009 were led for the same reasons to decide that as broad a range of transactions should be settled through CCPs as possible to mitigate overall risk in the financial system, OTC transactions included. However, such a high degree of concentration of the risks associated with the transactions called for the adoption of regulations on CCPs.

The European regulation on CCPs, known by its English abbreviation as 'EMIR', was published in 2012. 'EMIR' is a generic name for the main text of the European legislative act, regulatory technical standards (RTSs) providing for detailed technical rules and implementing technical standards (ITSs) facilitating the implementation of the legislation. In addition, Q&As are available to assist in the interpretation and application of the legislation. The ESMA (European Securities and Markets Authority) also publishes guidelines regularly for this purpose. A total of 9 RTSs and 3 ITSs were drafted for the EMIR (*Annex 1*). It should be noted that while the EMIR mainly concerns the activities of CCPs, it has introduced significant changes regarding trade repositories and mandatory reporting as well.

Figure 1**Regulations and guidelines relating to the EMIR**

The EMIR shifted counterparty risk towards CCPs, and by doing so, made their operation riskier than ever before. The focus of regulation is therefore on the recovery and resolution of CCPs at present, in spite of the fact that only three previous cases are known worldwide when a CCP failed⁶. In addition, the review of the EMIR is currently under way.



The development of the regulation of CCPs went hand in hand with the emergence of corresponding recommendations. The PFMI (Principles for Financial Market Infrastructures), which consolidates existing recommendations for financial market infrastructures and creates an appropriate framework for their evaluation, was published in 2012. Recommendations in the PFMI were later supplemented by further recommendations with the aim to improve the recovery, stability and transparency of CCPs.

6 1) Caisse de Liquidation (Paris) in 1974, 2) the Kuala Lumpur Commodity Clearing House in 1983, 3) the Hong Kong Futures Guarantee Corporation in 1987 (European Commission 2016; HILLS et al. 1999)

While the stability of the financial system is a common objective of the PFMI and the EMIR, there are a number of differences between them. The main difference is that the EMIR provides more detailed regulation. However, there are areas where legislative provisions are lacking and such gaps are filled by the PFMI. The scope of recommendations in the PFMI has widened since 2012 (see previous paragraph) to an extent that the EMIR cannot fully cover at present (in this respect, the distance between the PFMI and the EMIR has grown in recent years).

3 CRITICISMS AGAINST THE EMIR

This study aims to provide a critique of the EMIR regulation currently in force from the point of view of practical application and theory on the example of a guarantee system operated by a CCP. Criticisms against the EMIR are presented in the order the corresponding provisions appear in the Regulation and with the focus being on the components of CCPs' guarantee systems. Accordingly, provisions that do not concern the guarantee systems or closely related testing will not be part of our analysis. The subject of our analysis will be specifically Chapter 3 of the EMIR on prudential requirements and Chapters VI to XII of the RTS (2013), exploring the following topics exclusively:

- initial margin calculation,
- definition of the size of default funds and stress testing,
- back testing,
- sensitivity analysis,
- other issues.

3.1 Initial margin calculation

The purpose of the initial margin is to cover potential losses resulting from price movements under normal market conditions. The standard parameters for the models used for initial margin calculation (Article 41, EMIR; Chapter VI, RTS) in the case of exchange-traded financial instruments are as follows: 2-day liquidation period, 99% confidence interval, 12-month lookback period. Divergence is allowed for stricter but not for less strict parameters and the 12-month lookback period must be longer when no periods of stress are included in the data set. However, the legislation does not give any guidance about the definition of 'periods of stress', creating considerable uncertainty as to how the models should be adjusted in terms of the lookback period. For instance, is it sufficient to identify stress based on expert decision or an objective set of criteria is required? Also, which are

the instruments or markets where stress should be taken into account? The definition of stress from the point of view of a CCP was discussed by *Berlinger et al.* (2016). More importantly, why should the model be designed to include periods of stress when the original purpose of the initial margin is to provide protection in situations arising under normal market conditions? A different component of the guarantee system is dedicated to the management of such situations, namely the default fund, which is described in the next subsection.

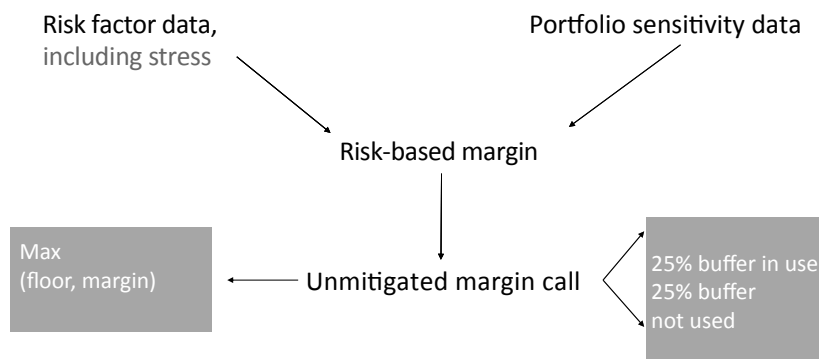
The initial margin in the case of CCPs is generally calculated based on a measure, typically VaR (value at risk) (*Szanyi, 2017*). However, the focal point of this study is not a critical evaluation of the VaR as a risk measure but the calculation of the initial margin and more specifically the management of the procyclicality buffer. The procyclicality buffer accounts for and smooths out the effect of cyclical patterns in the economy. In practice, when economic turbulence would warrant an increase of the initial margin, the procyclicality buffer may be released to avoid additional burden for market participants by raising the initial margin requirement. *Berlinger et al. (2017)* examined different margin strategies having the primary aim of limiting procyclicality. They have confirmed that taking procyclicality into account is justified from the perspective of CCPs, regulators and market participants alike.

Murphy et al. (2016) studied appropriate tools to mitigate procyclicality. The EMIR offers three options to limit procyclicality (RTS, 2013, Article 28):

- a) applying a margin buffer at least equal to 25 % of the calculated margins which [the CCP] allows to be temporarily exhausted in periods where calculated margin requirements are rising significantly;
- b) assigning at least 25 % weight to stressed observations in the lookback period calculated in accordance with Article 26;
- c) ensuring that [the CCP's] margin requirements are not lower than those that would be calculated using volatility estimated over a 10 year historical lookback period.

For clarity, *Murphy et al. (2016)* summarised the three methodologies in a figure. The different methodologies are marked in different types of print.

Figure 2
Forms of procyclicality mitigation under the EMIR



Source: Murphy et al. (2016:7)

The authors added two other procyclicality mitigation tools (Murphy et al., 2014) to the three options proposed by the EMIR. They present each of the five approaches in their paper. Their findings indicate that all of the tools may be effective in mitigating procyclicality, but in every case, it will be expert decisions that will define whether undermargining or overmargining receives more weight in the management of procyclicality. It always depends on the prevailing market conditions and on whether the interests of market participants (lower initial margin) or those of risk-mitigation of the CCP (higher margin) are given priority in setting the initial margin. The authors therefore recommend to consider moving from tools-based procyclicality regulation to one based on the desired outcomes, e.g. the impact of the tools on initial margin levels or their effectiveness in minimising procyclicality effects (i.e. to keep the initial margin as stable over time as possible). The different tools place the emphasis on different aspects (Murphy, 2016). Furthermore, their main finding is that it is not worthwhile to undermargin, as the model may not pass backtests or the CCP may run too high a risk. By contrast, overmargining may be reasonable since it makes a margin increase unnecessary when it would be required based on the model used due to the development of market conditions. Their main criticism against the EMIR is that it leaves unspecified the release and re-fund rules for the buffer for option (a) and lacks a precise definition of the stressed risk measure for option b).

In our opinion, it is a further deficiency of the EMIR that it does not make a connection between the definition of stressed periods – in the case of a 12-month lookback period – and the procyclicality buffer to be applied in calculating the initial margin. For releasing the buffer is subject to the condition that, otherwise, initial margin levels would soar, which, however, does not necessarily coincide with stress. We propose that the two options should be connected with each other

and the management of the buffer linked to the definition of stressed periods. The procyclicality buffer should also have the purpose of ‘smoothing out’ margin levels, i.e. to allow a lower amount to be deposited by releasing the buffer when the corresponding requirement would increase and so avoiding the additional burden an increased initial margin would place on market operators in an environment that may already cause them liquidity problems, e.g. in periods of stress. Such ‘smoothing out’, however, may not only counterbalance big increases but also big decreases in margin levels. The difference is that preventing big increases favours clearing members, while avoiding big decreases is in the interest of CCPs. This contradiction is reflected in the EMIR indirectly in the requirement to re-fund the buffer. However, it fails to provide for the timing of building back the buffer into initial margins. Moreover, re-funding the buffer may easily result in a spike in the initial margin (as it will suddenly become 25% higher) which is not considered or prevented by the regulator. In summary, the EMIR should put increased emphasis in our view on the need for CCPs to keep initial margin levels as stable over time as possible. Accordingly, the focus should be on smoothing out margin levels rather than on releasing the buffer, and a policy of releasing and re-funding the buffer in one step may not be the most suitable means to this end. Gradual release and re-funding would be more conducive to keep fluctuation low. The EMIR does not contain appropriate and effective provisions in this respect, despite the fact that the true purpose of the procyclicality buffer is smoothing out and stability.

3.2 Calculation of the default fund and stress testing

Stress tests are performed to identify extreme but plausible market conditions through past and hypothetical scenarios and to provide a basis for the calculation of the guarantee fund in accordance with Articles 42 and 49 of the EMIR and Chapter 7 of the RTS. *Hull (2012)* points out that one of the lessons of the crisis of 2007/2008 for risk managers is that attention should be shifted away from VaR models to stress testing, since VaR is backward looking while risk management should look to the future. By contrast, a number of CCPs construct countless hypothetical scenarios that are economically highly improbable instead of plausible ones, and perform stress tests and the relevant calculations on these scenarios (Szanyi, 2017). In our opinion, the EMIR should stress the plausibility of scenarios, i.e. the focus should be on the quality instead of the quantity of the scenarios in practical application. Bearing in mind that stress need not be reckoned with in the calculation of initial margins, in this case, it is implausible scenarios that should be avoided in practice. Such scenarios should be the subject of reverse stress tests looking into market conditions which may lead to complete exhaus-

tion of certain components of the guarantee system.

In 2015, the ESMA performed an EU-wide stress test where results were determined by assessing losses under a stress test scenario against both the initial margin (and other collaterals) and the individual default fund contributions posted by the clearing member concerned. However, it is not clear if this is permissible under the EMIR, and in our view, it is not appropriate to obtain results in this manner since the purpose of stress testing for uncovered losses is exactly to determine the size of the default fund. Including the value in the calculations which should be their final result will lead to underestimation of the required default fund size. Minimum scenarios are also applied in the ESMA exercise, which may be contested⁷ in the case of two product groups: currency products and options.

- For currency products, a high risk factor (+10 %) is determined for all currencies other than those belonging to the G7 group. There is a hole in the methodology at this point since foreign exchange rates are interdependent. Considering two currency exchange rates and their cross rate (e.g. EUR/HUF, HUF/PLN and EUR/PLN), it is highly improbable that all three exchange rates will rise by 10 % at the same time. As a result, the result of the stress test will be too severe and the default fund oversized.
- The ESMA recommends to include volatility in stress test methodologies in the case of options. This, however, is unnecessary as a volatility stress is useful in the case of derivatives the price of which does not change in direct proportion with changes in the price of the underlying product, as is the case for options. However, the purchase price for these products is payable when the contract is concluded, so neither the buyer nor the seller run any risk due to changes in the value of the option until the expiration date. A loss may be realised only on short positions for the party going long may only lose the purchase price received in advance. A short put option maximises losses, as in the worst case, the price paid upon conclusion of the contract will be lost upon expiry. A short call option is the only case where losses may be unlimited. If the writer of the call option owns the underlying product, there is no monetary loss to be covered. Accordingly, there is no point in stress testing for options when the writer owns the underlying product (Szanyi, 2017). However, the EMIR does not allow for such offsets when spot products and derivatives belong to different default funds. Another reason why stress testing is unnecessary in the case of options is that their initial margin is calculated using the SPAN system (Szanyi, 2017).

⁷ Objections are not directed against the EMIR but rather the expectations of EU-level regulators regarding compliance with the EMIR.

3.3 Back testing

The back testing procedure is laid down in Section 2 of the RTS. Back testing aims at controlling whether the initial margin calculated actually met the 99 % requirement at portfolio level. However, portfolio back testing is not sufficient to positively reveal the soundness of the model used. For this purpose, back testing at product level would be required. Back tests at portfolio level look at the adequacy of the initial margin, which involves a number of indirect effects, including the procyclicality buffer. Consequently, it cannot be established with certainty whether the VaR model used complies with the 99 % requirement. Furthermore, the 99 % level should not be treated as an absolute requirement by the regulator as it must be met in terms of expected outcomes during back testing, which also implies that the result of the test may be below 99 %. That does not necessarily mean that the model used is inaccurate. Strict adherence to the 99 % requirement should perhaps be secured by the regulator by additional buffers, for instance by an ‘expert buffer’ which would be applied when the result of back testing at product level is below 99 % in order to ensure compliance with the requirement.

3.4 Sensitivity analysis

The sensitivity analysis featuring in Section 3 of the RTS – but not included in the EMIR – requires of CCPs an analysis which is methodologically different from what the term normally stands for. It is defined in the RTS as a test to be performed on a representative portfolio of the CCP to assess the parameters of its margin model. In contrast, a sensitivity analysis should investigate which of the parameters of the models used in guarantee systems would have the highest influence on the component analysed, e.g. the initial margin, the default fund or back testing results, if they were changed, *ceteris paribus*, to the same extent, for instance by 1 %.

3.5 Other issues

A few points are raised by *Yagiz* (2014) which we consider relevant to guarantee systems but do not receive appropriate regulatory treatment. Moral hazard is a significant issue from the point of view of our study. The guarantee systems set up keep away well-performing and low-risk clearing members, since they should assume the risks of poorly performing members, shared through the default fund. It is therefore crucial for CCPs to keep a good balance between initial margin levels and the size of the default fund to attract well-performing clearing members to the market.

A second point to consider is competition among CCPs for clearing members. This gives CCPs a wrong incentive since they are compelled to collect lower margins from their clients in an effort to win them. The smaller-size guarantee system emerging this way leads, in turn, to increased risk. Regulators should pay careful attention to this wrong incentive.

Another important issue according to Szanyi (2017) is a considerable decrease observable in the initial margin levels and the size of the default funds used in the guarantee systems operated before and after the EMIR in the case of a high number of CCPs. Their guarantee systems underwent significant shrinkage in terms of value as a result of the change in regulation.

4 CONCLUSION

This study aimed to analyse a small section of the EMIR applicable to European CCPs to discover inaccuracies or possible deficiencies. The focus of the study was the guarantee system of CCPs and in particular the calculation of the initial margin and the default fund, together with a critical review of certain testing procedures such as stress testing, back testing and sensitivity analyses.

The key aspects of our analysis were the failure to provide a definition for stress and the management of the procyclicality buffer. In the case of the calculation of the default fund, stress testing and in particular the application of risk factors for certain products were the focal point. For back testing, the lack of product-level back tests were highlighted as a significant issue for risk management, together with the methodologically inconsistent definition of sensitivity analysis in the EMIR. Finally, the study revealed wrong incentives the EMIR gave rise to.

Annex 1

Regulation level 1	Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories
Regulation level 2	Commission Delegated Regulation (EU) No 148/2013 of 19 December 2012 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories with regard to regulatory technical standards on the minimum details of the data to be reported to trade repositories
	Commission Delegated Regulation (EU) No 149/2013 of 19 December 2012 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on indirect clearing arrangements, the clearing obligation, the public register, access to a trading venue, non-financial counterparties, and risk mitigation techniques for OTC derivatives contracts not cleared by a CCP
	Commission Delegated Regulation (EU) No 151/2013 of 19 December 2012 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories, with regard to regulatory technical standards specifying the data to be published and made available by trade repositories and operational standards for aggregating, comparing and accessing the data
	Commission Delegated Regulation (EU) No 152/2013 of 19 December 2012 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on capital requirements for central counterparties
	Commission Delegated Regulation (EU) No 153/2013 of 19 December 2012 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on requirements for central counterparties
	Commission Delegated Regulation (EU) No 876/2013 of 28 May 2013 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on colleges for central counterparties

Regulation level 2	Commission Delegated Regulation (EU) No 1003/2013 of 12 July 2013 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to fees charged by the European Securities and Markets Authority to trade repositories
	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
	Commission Delegated Regulation (EU) 2017/979 of 2 March 2017 amending Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories with regard to the list of exempted entities
	Commission Implementing Regulation (EU) No 1247/2012 of 19 December 2012 laying down implementing technical standards with regard to the format and frequency of trade reports to trade repositories according to Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories
	Commission Implementing Regulation (EU) No 1248/2012 of 19 December 2012 laying down implementing technical standards with regard to the format of applications for registration of trade repositories according to Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories
	Commission Implementing Regulation (EU) No 1249/2012 of 19 December 2012 laying down implementing technical standards with regard to the format of the records to be maintained by central counterparties according to Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories

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