European Association of CCP Clearing Houses

EACH Paper – CCP resilience during the COVID-19 Market Stress

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1. Introduction

The March 2020 COVID-19 lockdown environment had a severe impact on financial markets, leading to periods of extreme volatility during which Central Counterparties (CCPs) proved their ability to robustly deal with such an unprecedented crisis.

One year after the events took place and remaining in COVID-19-related business continuity mode, this paper takes a deeper look into the details of CCPs' robust risk management of the COVID-19 market stress during the months of March and April 2020.

The analysis presented in this paper focuses on the margins provided by clearing members to CCPs with the objective of managing the risks of their positions. It is structured into four areas:

- **Measures taken by CCPs during the COVID-19 market environment** – The purpose of this section is to analyse the first actions taken by CCPs during the COVID-19 market environment.
- **Behaviour of margins** – This section analyses the reasons and implications of margin moves during the COVID-19 market stress.
- **Anti-procyclicality (APC)** – This section looks at the performance of existing APC tools during the COVID-19 market stress.
- **Conclusions and Proposals** – While the CCP clearing environment performed robustly, this section considers ways to handle extreme market environments even better in the future.

This analysis is based on a research performed through 13 EACH Member CCPs, managing risk for a wide range of financial instruments traded both on regulated venues and over the counter (OTC), including equity, fixed income, derivatives and commodities, representing close to 400 bn EUR of initial margin[1].

Key findings and recommendations

- **Resilient CCP performances were ensured by measures taken by CCPs in response to the COVID-19 crisis** that considered employee safety, robust risk management and communication with authorities and market participants.
- **CCPs margins responded largely as designed** and remained well above regulatory thresholds. Margin increases (variation and initial) were largely due to high volatility and position change. **CCPs will continue to consider the impact of margins on market liquidity.**
- **Existing APC measures helped with the CCPs' robust response** to the COVID-19 market stress, and CCPs will consider potential improvements that can be considered in review these APC measures.

[1] Source: CCP's Public Quantitative Disclosure as found on the EACH website.

2. Measures taken by CCPs during the COVID-19 market environment

The COVID-19 market environment was a crisis different to others experienced in capital markets because not only it had an impact on CCPs by increases in volatility, margins and market activity, but is also had the additional operational consequences of affecting the way CCPs normally work due to the pandemic requiring staff to largely work from home.

To deal with such an environment of intense market activity and in order to ensure continued resilient performances, the CCP industry focused its efforts on:

- **Employee safety and robust risk management** – European CCPs are always fully focused on providing safe and efficient markets, business continuity and supporting financial stability. We continue to do so in the current circumstances, while also ensuring the safety of CCPs' employees and their families.
- **Applying business continuity protocols where needed due to COVID-19 nature** – The nature of COVID-19 situation has generally made CCPs deploy their business continuity plans. These plans are regularly tested by CCPs and therefore have been implemented smoothly. In line with these plans, CCP staff may generally distribute between the main site, secondary sites and working from home.
- **Ensuring the performance of CCP functions as expected notwithstanding market volatility and trading volumes** – The trading volumes and high volatility have increased the volumes of regular CCP activities, but these are all being handled as expected. European CCPs remain as always with cover-2 resources for the current market conditions and participants' books.
- **Ensuring communication to authorities and market participants** – CCPs were in constant contact with authorities and market participants to ensure markets can remain open and risk can be managed adequately. CCPs have also made public statements on COVID-19 to ensure that the public is aware of public CCPs' actions and the deployment of their contingency measures.

3. Margins

Margins are amounts required from its clearing members by the CCP to either i) protect the CCP and its members against the potential future exposure to a defaulting clearing member from the last margin collection until the liquidation of positions (initial margin); or ii) to reflect current exposures resulting from actual changes in market price (variation margin).[2]

During the COVID-19 market stress, European equity market indices experienced rapid drops that were among the largest (or the largest) observed in similar crisis periods in the history of indices (Table 1). Volatility was very high reaching levels of 84,7969 index points (see figure 1 below) reaching volatility levels not seen since the 2008 financial crisis (highs of 81,0342 index points). On the fixed income side, yields saw significant swings, with moves reaching magnitudes of 50-60 bps on core Eurozone bonds and 125 bps for peripherals on five days; the core peripheral Eurozone spread spiked at 279 bps on 17th March 2020.

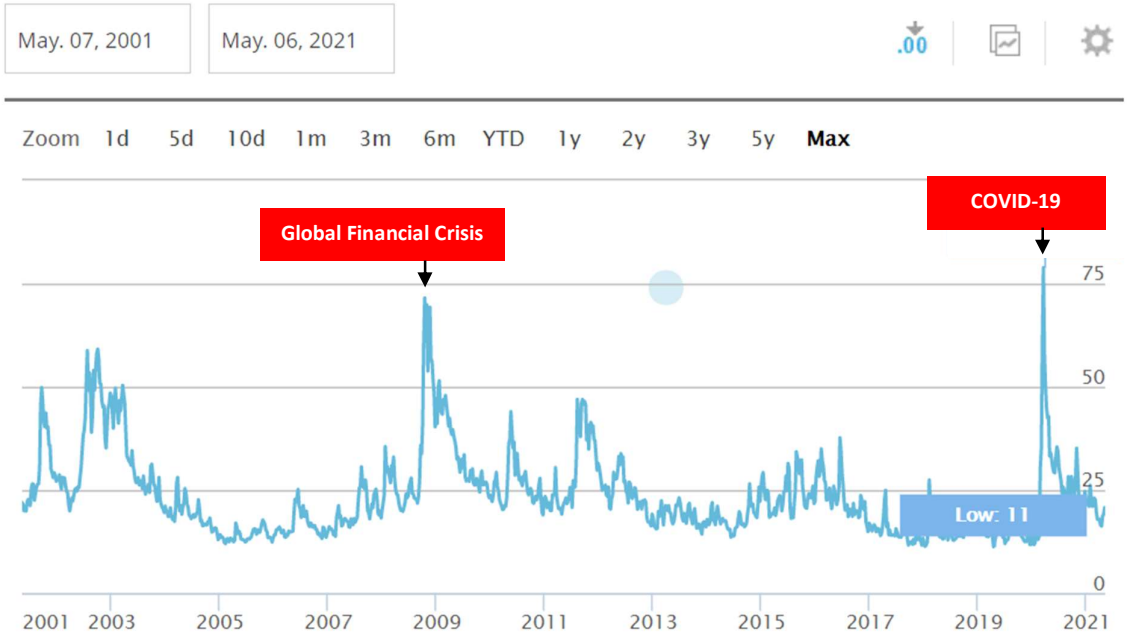

Figure 1 - VSTOXX index over 20 years from 2001 to 2021 showing peak Volatility periods – Source: stoxx.com

[2] While initial and variation margin are the most usual type of margins applied by CCPs, other margins may be applied depending on the CCP's risk management framework, such as concentration margin, which may be required by some CCPs in combination with initial margin to deal with concentrated positions.

Table 1 - European stock market indices during the COVID-19 stress period

Index	Change (Period 01/02/2020 – 01/04/2020)	Daily drop (12/03/2020)
CAC 40 ↓	-27%	-12% (largest ever)
DAX ↓	-26%	-12% (2nd largest ever)
FTSE 100 ↓	-25%	-11% (2nd largest ever)
FTSE MIB ↓	-24%	-17% (largest ever)
IBEX 35 ↓	-30%	-14% (largest ever)

CCP risk models are designed to respond to market moves and hence reacted during the COVID-19 market stress generally by triggering margins requests from clearing members. This section will look at the following aspects of those margin increases:

- Impact of COVID-19 on CCP margins and reasons behind
- Predictability of margins and market moves
- Impact on CCP risk framework

Impact of COVID-19 on CCP margins

All CCPs participating in this analysis (13 out of 13) reported an increase in margins during the period of March 1st to April 30th 2020. On balance, responses indicate that these margin increases are largely due to end of day margin (EOD) calls, although some CCPs did note an increase in intraday margin calls. One CCP observed an increase in both intraday and EOD margin levels but noted that this did not lead to a margin call given that clearing members had already posted sufficient collateral. Some CCPs (5) noted that these margin increases were mainly Variation margin (VM), other CCPs (6) responded the increase was predominantly IM.

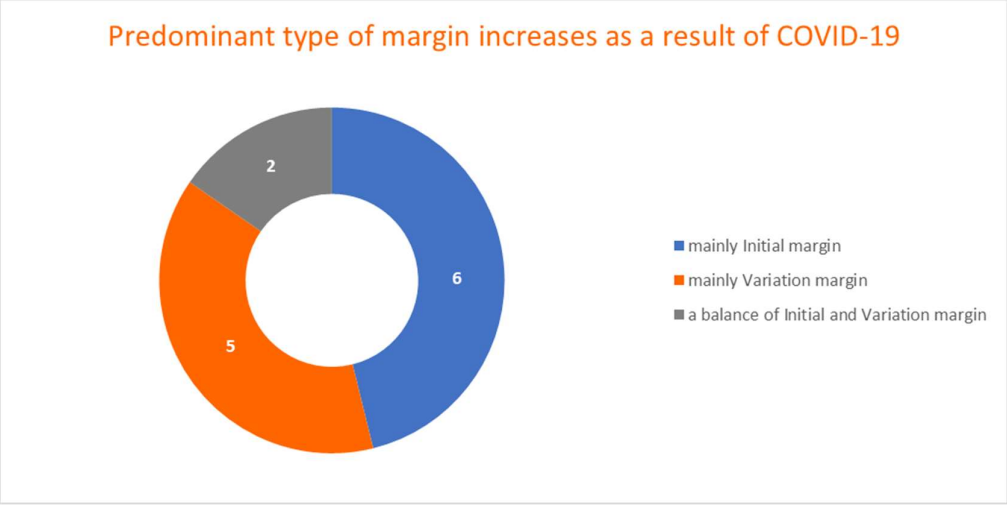

Figure 2 - predominant types of margin increases as a result of COVID-19

The increase in initial and variation margins was stressed by the ECB, which stated that 'Initial and variation margins collected by four European central counterparties together increased by around €60 billion during the peak of the crisis'.[3] The data below shows that initial margin levels for European CCPs increased significantly as a result of the COVID-19 market stress of March/April 2020 (Q1 & Q2 2020) and began to drop in Q3 of 2020 after the COVID-19 market stress period was over.

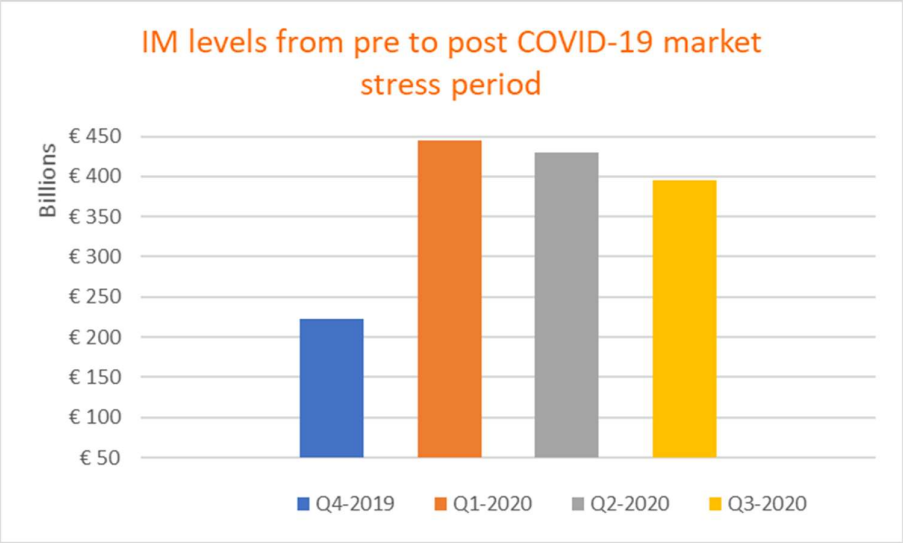

Figure 3 - Progression of Initial Margin from before the COVID-19 market stress period (Q4 2019) until after (Q3 2020). The data shown is the total IM per quarter of 18 European CCPs.

A deeper look specifically into the IM increases shows they **originated following an increase in market volatility** in some form or another, such as:

- High market volatility increasing VM, in turn causing IM to increase.
- VM losses feeding into IM increases – Some CCPs allow VM gains to offset IM requirements and VM losses to increase IM requirements.

Another factor behind a predominant IM increase not linked to volatility and VM is higher volumes of trading, with one CCP noting their IM increase came from new risk positions and not calling additional collateral against existing positions.

As per the figure 5 on the next page, CCPs responses showed that **the main drivers behind the total margin increases (both IM and VM) are market volatility as well as a combination of market volatility and position change**. Secondary drivers were shown to position change and change to the level of price rather than the volatility of price.
On Market Volatility, it should be considered that VaR-based models gradually incorporate new information about increased market volatility which translates into margin increase without any margin model change.

[3] See Speech by Isabel Schnabel, Member of the Executive Board of the ECB, Financial Stability Conference on "Stress, Contagion, and Transmission": https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp201119_1~4a1ff0daf9.en.html

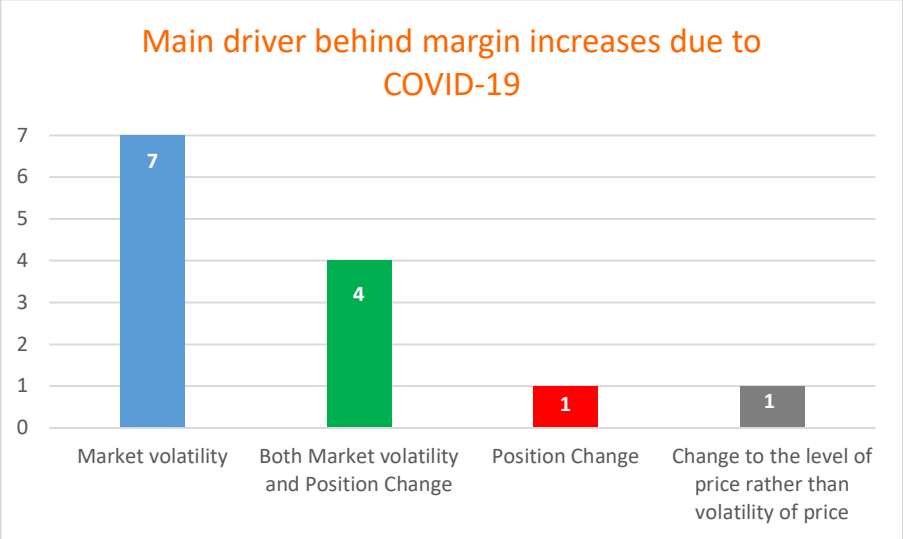

Figure 4 - Main driver behind margin increases resulting from COVID-19

Predictability of margin models

Discussing the predictable nature of margins, it is important to distinguish between the predictability of margin models and the predictability of margin increases.

Margin increases that follow market moves can only be as predictable as market moves are. Margin increases that follow moves in clearing members' positions are controlled by them, since clearing members should be able to replicate them due to the public availability of prices and margin parameters.

The **reaction of margin models however to those margin increases should be predictable by clearing members** because:

- Clearing members are informed in advance of changes in risk parameters (via publication on the CCP's own website or similar means) so that clearing members have enough time to adjust their liquidity needs;
- Clearing members know in advance the thresholds applied by the CCP to require intra-day margin calls.

Margin breaches

CCPs margins responded largely as designed to the market stress period and remained well above regulatory threshold. A large majority of CCPs (over 80% of respondents) experienced margin breaches during the March 1st to April 30th 2020 period. These margin breaches are however expected during a period of extreme volatility given that CCPs manage risks to very high confidence intervals, higher than 99%, but cannot manage risk with 100% confidence level.

Intraday margin calls

Results show that over half of the responding CCPs (6 out of the 13) schedule and define intra-day margin calls to some degree, with one CCP noting that clearing members can even

monitor their exposure in real time. Out of the remaining 7 CCPs, 1 CCP does inform their Clearing Members when they are approaching the limits that trigger a margin call.

On the other hand, non-disclosure of this timing and number of intraday margin calls is also done to ensure an adequate risk coverage. Furthermore, CCPs that operate this way compute and require intraday margins on a daily basis. Therefore, in the event of high volatility their clearing members are not surprised by two or more intraday margin calls, meaning these intra-day margin calls are not unpredictable. Another CCP noted they operate event-driven intraday margin-calls which reduces the time when clearing members are under collateralised and responds to market changes quickly.

Clearing members ability to pay margins

No responding CCPs reported any issues with clearing members ability to pay margins during the COVID-19 market stress.

Parameters changes

The majority of CCPs analysed reported that **model parameters did not change** due to COVID-19 market stress. Out of those CCPs, one noted that they had modified margin intervals but not input parameters, and another that standard recalibrations, such as collateral haircuts, still occurred.

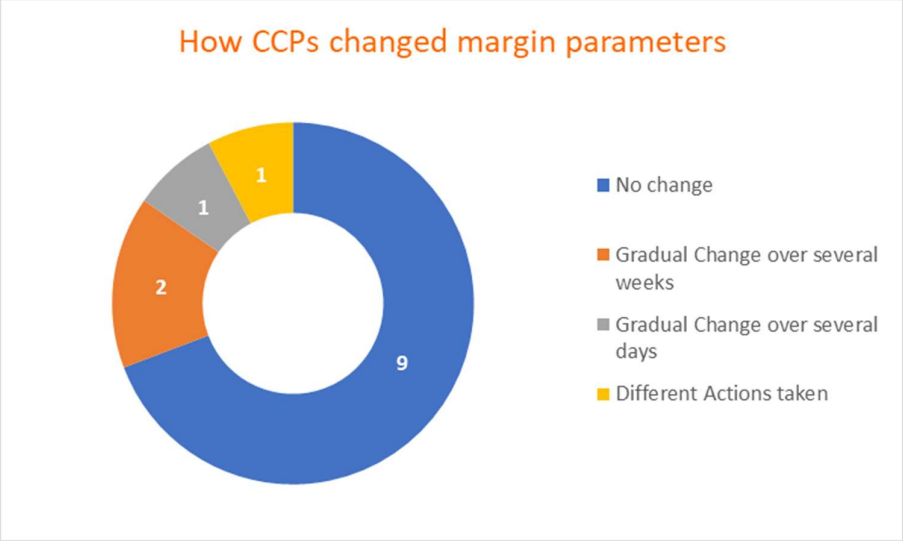

Figure 5 - How CCPs changed Margin Parameters

Of the minority CCPs that did change their model parameters due to COVID-19, only one CCP noted it was a steep change that took place over a few days, with all others doing so gradually over several days/weeks. Furthermore, **CCPs noted that margin models and processes remained consistent and performed well throughout the pre- and post-March 2020 period of volatility.**

Other Risk Management Changes

A large majority of CCPs (10 out of 13) did not make any changes to their risk management framework during COVID-19. **Risk models proved resilient during the COVID-19 market**

stress, performing as designed, with no adjustments required to accommodate the heightened volatility.

Negative effects of a potential Variation Margin pass-through mechanism

In its report of June 2020 on "Liquidity risks arising from Margin Calls", the ESRB recommended that CCPs should consider the margin covering realised exposures resulting from market movements on that day and that CCPs should consider collecting and paying this out on the same day.

While EACH very much welcomes that the ESRB requests CCPs 'to consider' rather than 'to oblige' CCPs, EACH believes it would be legally, in addition to operationally, challenging to pass through VM as suggested in section 4.1 of the ESRB report. The market's legal, risk, technical and operational configurations would have to be redrafted. Doing so would of course un-net intraday payments with the associated risk and operational burden. Table 1 below analyses the issues that EACH finds with this proposal from different angles.

Table 2 - EACH concerns with a VM pass-through mechanism

EACH concerns with a VM pass-through mechanism	
Legal	EACH believes it would be legally, in addition to technically, challenging to pass through VM as suggested by the ESRB in section 4.1 of their report. The market's legal, risk, technical and operational configurations would have to redrafted. This challenge becomes explicit in some jurisdictions like the US, where Designated Clearing Organisation (DCO) cannot pass through customer property (client margin) unless it is settlement proceeds (i.e. it is the result ofsettle-to-market or STM – which occurs once per day). All cleared customer OTC trades in the US have been STM since 2017. Under EMIR, protection of variation marginis not as clearly defined as in US regulation (CFTC LSOC regulation). In particular, as established by Article 39 and 48, protection is for asset and positions. However, as pointed out by ESMA previously, there were some legal uncertainties whether variation margin would fall outside this protection or not (See ESMA report). This reinforces the legal challenge that applying the pass-through approach as proposed in the ESRB document would represent.
Increased Risk	Where loss makers cannot post excess non-cash collateral today to mitigate against intra-day calls in an intra-day RVM process and may actually prove a liquidity burden upon the market. Increased usage of markets by members to transform collateral to meet calls,in some cases at times when liquidity is thinner. Members being paid profits may find difficulties investing appropriately, the later in the day intra-day payments are made; this is likely more relevant for smaller members. CCP's would be required to retain sufficient cash on hand in order to meet payment obligations should member(s) called fail to meet these. This could lead to greater amounts of cash being left unsecured intra-day by CCPs and/or attempts to access transformation markets in order to fund payments during illiquid

	periods of the day (if not already past cut-off times). In BAU, i.e. without non-receipt from loss makers, these funds then need to be invested later in the day, potentially when liquidity in secured markets is thinner or unavailable.
Operational	This approach could require multiple Realised Variation Margin (RVM) runs intra-day with associated controls around market pricing – it may not always be possible to design the pricing controls as robustly as at end of day and if this process creates actual P&L this could create unexpected market behaviours. Could potentially lead to operational implications for members with flows both in and out on the same day, particularly if underlying clients demand thebenefit of profits paid. When considering the USD swap market, CCPs would need to move to a twice daily Settle-to-market (STM) in order to 'settle' and pass through the USD settlement proceeds. If one follows that thinking through, would STM now mean e.g. half a day PnL? Does this means that CCOs should keep e.g. EUR swaps on daily STM (full day PnL)? This becomes overly complex.
Costs	It will create additional transaction costs due to increased flows through settlement banks. There could also be an increase in daylight liquidity lines required, potentiallyused later in the day, increasing costs for the market.
Accounting	Consideration would need to be given to accounting implications and whether the revised approach would impact mark to market/settle to market frameworks in any way.
Market structure	Not all markets are RVM based and therefor make it less likely that a full net flat liquidity outcome could be supported. This could distort liquidity benefit, with gains paid being subject to some pro-rating, or leave CCP with liquidity shortfall upon payment out.
Current practice	Some CCPs do provide at least one fixed point of the day (in addition to EOD) to pay members excess collateral, based on an approximate MtoM process rather than a full RVM process at a time when investment facilities are still available and controlled through withdrawal limits.

4. Anti-procyclicality

Procyclicality can be generally defined as the 'tendency of financial variables to fluctuate around a trend during the economic cycle. Increased procyclicality thus simply means fluctuations with broader amplitude[4]'. Applied to CCP clearing, procyclicality may therefore refer to the possibility for certain risk management actions during times of stress to have knock on effects in other parts of the financial ecosystem that may make the stress worse. An example usually referred to when talking about procyclicality in the clearing space is eventual effects that requiring clearing member margin in response to market volatility may have on potential scarce liquidity.

When discussing the contribution of CCP margins to procyclicality, it is important to distinguish between initial and variation margins. While initial margins may potentially remove liquidity from the financial system for the benefit of contributing to its stability, variation margins reflects the exact profits and losses on the clearing member's positions, which the member can observe in the market in real time. **Variation margins are therefore not procyclical by definition and are instead considered exogenous**, as per a recent Bank of England statement[5]:

'*Large moves in asset prices led to significant increases in CCPs' variation margin requirements, which mirror actual price moves in underlying markets. As variation margin reflects the new market price of a product, gains by market participants on one side of the trade are equal to the losses incurred by other market participants.*

This means that, in aggregate, variation margin does not typically remove liquidity from the system, but rather redistributes it. It ensures that financial firms can depend upon the derivative instruments they have bought to manage their risks once those risks start to crystallise.'

In line with regulatory requirements, **EU CCPs have a variety of measures to address the potential procyclicality of margins**. Anti-procyclicality measures (APC) are important to avoid margin requirements falling too low in good times, entailing a potentially destabilizing correction in bad times.

[4] https://www.bis.org/review/r090805d.pdf
[5] https://www.bankofengland.co.uk/-/media/boe/files/annual-report/2020/supervision-of-financial-market-infrastructures-annual-report-2020.pdf

Anti-procyclicality options included in EMIR

The EMIR legislation describes **three options to deal with procyclicality**[6]:

- **'25% buffer'** - Applying a margin buffer at least equal to 25% of the calculated margins which it allows to be temporarily exhausted in periods where calculated margin requirements are rising significantly;
- **'25% weight to stress'** - Assigning at least 25% weight to stressed observations in the lookback period calculated in accordance with Article 26 of EMIR RTS 153;
- **'10-year floor'** - Ensuring that its margin requirements are not lower than those that would be calculated using volatility estimated over a 10-year historical lookback period.

Existing APC measures have been applied by CCPs to limit margin increases also during the recent crisis, where margins had to respond to extraordinary volatility spikes. Thus, **margins reacted gradually and adequately first exhausting the procyclicality buffers which smoothened the pace of the increase.** Therefore, the necessary response has already been of lower magnitude and more gradual than it would have been without anti-procyclicality measures put in place by CCPs.

This section of the paper will look at the following aspects of those margin increases:

- Performance of existing APC tools during the COVID-19 market stress
- APC tools used by European CCPs
- Testing of APC tools
- Suggestions to review existing APC tools

Performance of existing APC tools during the COVID-19 market stress

European CCPs unanimously found that the existing APC measures helped with the CCPs' robust response to the COVID-19 market stress.

As an illustrative example, 10-year lookback floor is set to an appropriate level during low volatility periods in order to prevent and reduce any procyclical effects during COVID-19. This includes regular and ongoing margin data updates, where recent stress periods are included in the margining computation to ensure proper margins.

APC tools used by European CCPs

As detailed in figure 8 below, of the existing APC options in EMIR, the margin buffer under EMIR Article 28(a), either on its own or in combination with the margin floor under EMIR Article 28(c) is more largely used than others. The combined use of APC options may arise from CCPs providing several clearing services where different APC options are used for different services, rather than a CCP using different methods for the same service.

[6] As described in Article 28 of EMIR RTS 153/2013 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R0153&from=EN

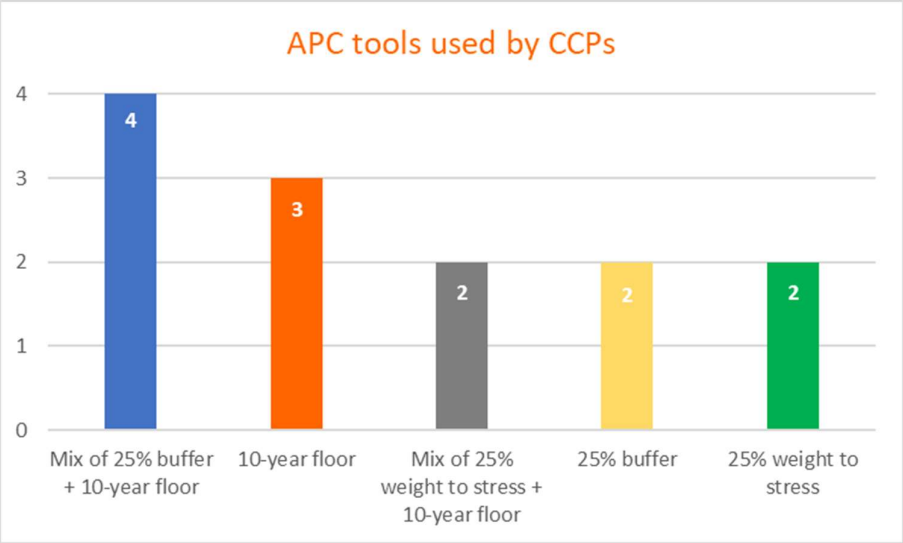

Figure 6 - APC tools used by CCPs – NOTE: The combined use of APC options may arise from CCPs providing several clearing services where different APC options are used for different services, rather than a CCP using different methods for the same service

Testing of APC tools

A large majority of CCPs (12 out of 13) perform **regular testing of their margin models to guard against procyclicality**. Some CCPs have dedicated procyclicality risk policies where tests are performed as part of the sensitivity testing[7]. Several metrics and market indicators may be used to assess procyclicality of a CCP margin model such as position change control tools or the range, volatility and percentiles of the margin changes for a specific contract over a defined period.

Procyclicality in the bilateral market

In their paper *COVID-19 and CCP Risk Management Frameworks*[8], ISDA makes a comparison between CCP margin models and ISDA SIMM models noting that the latter was more conservative. Whilst in the time period concerned the impact of margin calls was substantial[1] and the ISDA SIMM model did act more conservatively, it would do better to consider that CCP models are updated more frequently, so they can adapt to the recent volatile environment. This forms a key part of CCPs in their systemic role, providing an excellent balance between model reactivity to market volatility and avoiding APC effects. This is even more crucial when considering that the first objective is to collect enough guarantees to ensure a solid default waterfall and protect the system from default events that could be more likely during stress market events. Therefore, whilst one can indeed observe conservativeness in terms of the size of margin parameters, the model effectiveness is not guaranteed. In short then, the CCPs' ability to net VM payments is essentially to limit liquidity strains, the risk of under-collateralization and operational risks – something that is not possible in uncleared markets and where we understand an important part of the strain has taken place.

[7] Sensitivity tests are performed by CCPs to assess the coverage of its margin model under various market conditions. EMIR defines the details about the performance of CCPs' sensitivity tests in Article 50 of EMIR RTS 153.
[8] https://www.isda.org/a/3jjTE/COVID-19-and-CCP-Risk-Managament-Frameworks-January-2021.pdf

Where the comparison of the ISDA SIMM and CCP models is concerned, the prior is generally more conservative, although the ISDA SIMM's conservativeness is itself a function of the holding period assumption used in bilateral markets where less liquid and exotic products are traded. Furthermore, the accuracy of this statement in itself also depends on which CCP IM model we are talking about. In the feedback provided by CCPs to the comparison of the ISDA SIMM and CCP models was the general sentiment of where is the advantage in a system that a) hardly changes to market volatility and b) cannot be calibrated on a daily basis. It is evident that the Risk management needs of the Bilateral and Centrally Cleared market are catered for by the respectively used ISDA SIMM and various CCP IM models.

5. Conclusion and Proposals

Robust performance of CCPs during the COVID-19 market stress

As described in this paper, **the CCP clearing environment performed robustly during the COVID-19 market stress period**. Different authorities around the world stressed this robust performance at different occasions:

- **ESMA** (Jul. 2020) –ESMA acknowledged that '*EU CCPs remained resilient through the (COVID-19) crisis, despite the increased market volatility and operational risk'* and that the stress scenarios included in the ESMA CCP Stress Test exercise '*were found to be overall of comparable severity with the most recent stress events*'[9]
- **ESRB** (Jul. 2020) – '*Greater central clearing of derivatives and collateralisation of non-centrally cleared derivatives positions have significantly strengthened the resilience of derivatives markets since the aftermath of the 2008 financial crisis. These reforms – led by the G20/Financial Stability Board – helped to ensure that recent market stress has not resulted in widespread concern about counterparty credit risk.*'[10]
- **FSB** (Nov. 2020) – '*The recent periods of market turmoil have demonstrated the benefits that central clearing brings for global financial stability*'[11].

In addition to successfully dealing with the COVID-19 market environment, the resilience of European CCPs was also demonstrated during the COVID-19 market environment through two events:

- **Robust performance of CCPs during fire drills in BCP mode** - During the second quarter of 2020, 16 European CCPs successfully performed Fire Drill Tests in Business Continuity Planning (BCP) mode. Fire Drill Tests are regularly performed by CCPs to confirm the readiness of a CCP's default management structure. During a Fire Drill Test, CCPs usually test the operational readiness of the CCP's staff, procedures, IT Systems and clearing members throughout the different layers of the default waterfall.

  Performing Fire Drill Tests in BCP mode represented an additional challenge that CCPs have successfully met, as the default management structure has been tested with some or all of the CCP and clearing members staff working remotely.

- **Successful performance of the ESMA EU-wide CCP Stress Test 2019** – The ESMA report for this exercise[12] demonstrates that European CCPs are resilient and well equipped to withstand extreme market developments. The exercise covering credit, liquidity and concentration risks '*confirm(ed) the overall resilience of EU CCPs to common shocks and multiple defaults for credit, liquidity and concentration stress risks.'*.

[9] https://www.esma.europa.eu/sites/default/files/library/esma70-151-3186_3rd_eu-wide_ccp_stress_test_report.pdf
[10] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020Y0720(01)&from=EN
[11] https://www.fsb.org/2020/11/fsb-releases-guidance-on-ccp-financial-resources-for-resolution-and-announces-further-work/
[12] https://www.esma.europa.eu/sites/default/files/library/esma70-151-3186_3rd_eu-wide_ccp_stress_test_report.pdf

The **ESMA CCP Stress Tests complement the already rigorous standards to which European CCPs are held by their regulators**, laid down in EMIR. In accordance with EMIR, CCPs themselves also perform daily stress tests on their systems and models to ensure that they are fit to perform in situations of extreme but plausible market stress and default. The outcomes of these internal stress tests are scrutinised by clearing members and regulators to ensure their continued validity. A broad number of authorities are included in the ongoing CCP supervision through the CCP Supervisory Colleges which include National Competent Authorities (NCAs) of the Member State where the CCP is located, NCAs from other Member States, the ECB and ESMA itself.

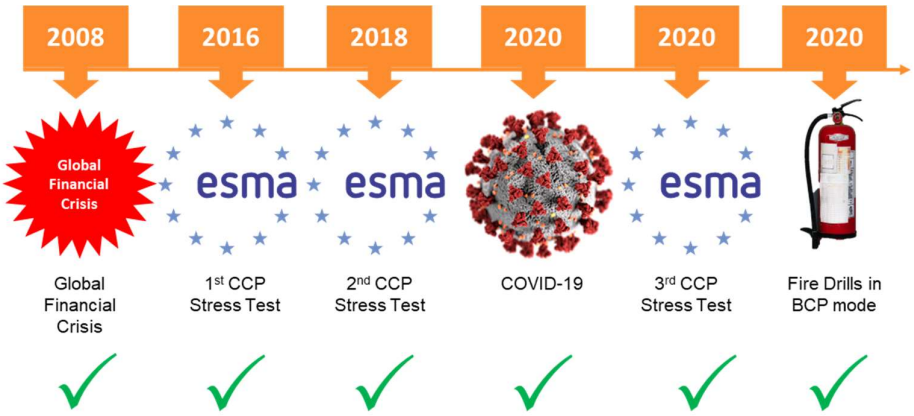

Figure 7 – European CCPs robust performance during recent stresses

Suggestions to further consider the impact of margins on market liquidity

While CCPs already apply several measures to alleviate the liquidity strain of intra-day margin calls, a more widespread acceptance of such measures would be useful. These measures include:

- **Increasing the range of non-cash collateral eligibility** (e.g. bank guarantee, other instruments (considering proper but less strict level of liquidity and credit risk)) by using prudent haircuts and also the acceptance of credit lines in the Commodities segments would alleviate non-financial institutions from liquidity strains.
- **Intraday netting** of initial and variation margin;
- **Clearing members** to account for change in volumes in their liquidity stress testing when scheduling intraday margin calls.
- **Further increase awareness** of clearing members about how CCP models work, with the objective of increasing clearing members understanding of how the model reacts to stressed scenarios.
- **Keeping prudent and conservative margin models'** input parameters to keep a buffer both pre and post crisis.
- **New Regulation or guidelines for Clearing Members** on how to prepare for sudden and large-scale margin calls from the CCP.

Suggestions to review the existing APC measures

While undoubtedly European CCPs margins were less procyclical, improvements can always be made. **European CCPs believe there are potential improvements that can be considered to review the existing APC measures**:

- **Recalibration of tools** - CCPs believe that the best way to improve APC tools would be through a recalibration of such tools to ensure margin increases in response to volatility are less extreme in the future.
- **Reconsideration and strengthening of margin floors**.
- **Setting a target for the maximum rate of change** over a defined period of time for a specific volatility scenario.

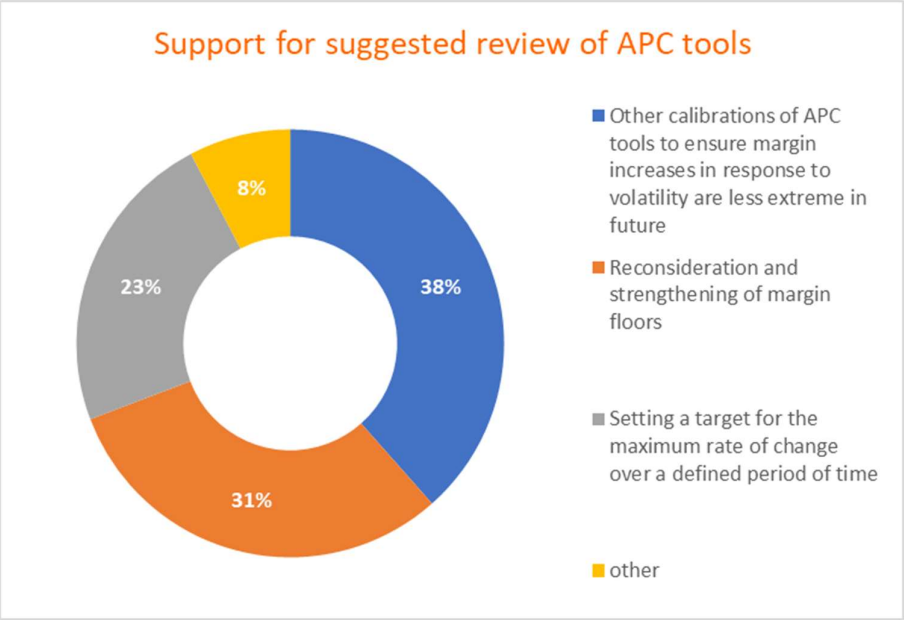

Figure 8 - Support for suggested reviews of APC tools

When addressing the question of reviewing APC tools, it should be considered that it is **difficult to balance APC measures with margins efficiency and the safety of a CCP in periods of high volatility**. Taking that into account, some key elements that a review of APC measures should consider include:

- How should one **interpret evaluation results** concerning the effectiveness of the APC rules (i.e. what is considered as 'effective'?)
- To what extent do these rules **interfere with the effectiveness of IM models**, particularly when it comes to EMIR model performance requirements?
- **The scope of application**, i.e.: When is a period defined as cyclical (e.g. economic downturn or recession) and therefore when should anti-procyclical measures should apply? Is it when the majority of instruments is affected? Or even when some instruments that belong to a certain sector are affected (e.g. turmoil in energy stocks)? Or even when issuer specific events lead to a sharp increase of volatility and hence in margin requirements.
- **Outcome based approach**: European CCPs could be compelled to regularly disclose certain procyclicality Key Performance Indicators under an outcome-based approach

to APC. This in turn would allow for increased understanding of market participants and regulators and could inform further regulatory adaptations if and as required.[13]

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[13] Murphy, D., Vasios, M. and Vause, N., 2016. *A comparative analysis of tools to limit the procyclicality of initial margin requirements. Working* Paper No. 597. Bank of England. Available at: https://www.bankofengland.co.uk/working-paper/2016/a-comparative-analysis-of-tools-to-limit-the-procyclicality-of-initial-margin-requirements