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The Financial System's Resilience is Everything, But at what Cost?

SUMMARY: The purpose of this study is to introduce the role of CCP in the market, the importance of the risk management framework, including the tools used in the case of insufficient guarantee funds. The study is descriptive, and besides detailing the EU-level regulatory framework, it also illustrates its possible setbacks from the perspective of the market participants and professionals. It points out that the common goal and interest of all actors are to ensure the viability of the CCP, but the poorly designed capital management and strategy can hinder this. Although the regulatory framework has been applied across Europe and its fine-tuning can be said to be constant, its effectiveness and resilience to shocks will be supported or refuted by an adverse event in the market.

KEYWORDS: central counterparty, skin-in-the-game, recovery plan, incentives

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After the distress hit the financial system in 2008, at the London Summit in April 2009, the G20 leaders all agreed that the current system in the whole world is vulnerable. Regulators have started taking steps to overcome the discrepancies. The biggest concern related to the regulatory framework was that it was incapable of preventing imbalances and spillover of distress among entities, or even countries. As a result, over the past decade, structural changes were applied in the financial system. Recent regulatory initiatives aim to enforce the system by proposing important prudential

requirements and improved protection rules. Central counterparties (CCP) were one of the fields requiring robust improvement. Besides the implementation of new regulatory frameworks, CCPs gained high importance in the financial world. Over the last years, this area became the dominant institution in the “non-banking” field. The G20 leaders recognized the benefits in risk management offered by CCPs, so they agreed in 2009 that standardized over-the-counter derivative transactions should be centrally cleared (G20, 2009). The aforementioned prudential requirements were for CCPs themselves also established to strengthen their resilience to promote systematic stability. Since the crisis, global standards have been implemented to

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ensure resilience and are continually being adjusted and improved.

DISCUSSION

The general mechanism of a CCP

The CCP becomes a “central” party between traders, becoming a buyer to the seller, and a seller to the buyer, a process called novation. The two parties are, therefore, no longer exposed to each other, but only to the CCP, which provides insurance against bilateral default risk (Biais et al., 2012). The benefits CCPs give is that the CCP takes market participants’ trading exposures onto its balance sheet, relieving the counterparties of multilateral risk exposures. They reduce counterparty risks among market participants, and the multilateral netting gives further benefits to the members. [(Lopez and Saeidinezhad (2017), Cont and Kokholm (2014)]. As discussed by Elliot (2013), CCPs became “*too important to fail*” and “*too interconnected to fail*” so they can be considered as the backbone of the financial system. This feature of CCPs is also regarded as a potential source of risk (Markose et al., 2012; Duffie and Zhu 2011).

Risks of CCPs

The default of a clearing member is typically the CCP’s primary source of uncertainty when one or more clearing member fails to meet their obligations. In this case, the CCP needs to take measures to re-establish a matched book (Plata, 2017). In typical conditions, this is achieved through the auction of the open positions amongst the non-defaulting clearing members (Wendt, 2015). Failing to return to a matched book would expose the whole system to heightened risk, and it would

have even worse effects in stressed conditions, leading to the usage of additional resources, such as the contributions of the default fund from non-faulty members (Priem, 2017). The most vulnerable points, including points by which a CCP could trigger or amplify systemic risk, is liquidity risk creation, the transmission of stress, risk shifting, wring-time risk, and information and incentive issues (Murphy 2017; Pirrong, 2014; Hughes and Manning 2015).

A CCP’s leading role and purpose are to centralize counterparty risk management in the financial markets that operate (Pirrong, 2014). By analyzing the risks and the systematic importance of the CCPs, many – i.e., Cox and Steigerwald (2017), Hughes and Manning (2015), Faruqi et al. (2018) draw similarities with banks. However, there is a resemblance between the two types of financial institutions; it is crucial to emphasize that CCPs are not banks. CCPs are acting as risk managers – therefore subject to credit and liquidity risk of clearing members default - while banks are risk-takers. Compared to the functioning of banks, the “specialties” of CCPs is presented by Berlinger et al. (2016), this determines their risk management system. CCPs can be called unique in the meaning that they are not payment systems, depositories, insurance companies or exchange platforms, nor trading platforms, although they have characteristics that be similar to insurance because of their “guarantee mechanism.” This guarantee mechanism is the reason why the inclusion of a clearinghouse may lead to seeing the CCP as an insurer, rather than a principal to cleared trades: “*While both serve an intermediary function, the similarity ends there*” (Cox and Steigerwald, 2017).

The positive side of the risk-reducing mechanism is that each trade cleared contributes to multilateral netting of exposures, thereby reducing the amount of risk to be managed

relative to a non-centrally cleared ones (Duffie and Zhu 2011). Consequently, CCPs clear more trades and market processes concentrate around it, increasing its importance and reliance as well, so a potential spillover in the system should be managed correctly and in time. The risks amplify because the CCP will be unable to accomplish its primary role and cannot absorb the shock, leading to its materialization of the distress. Due to the liquidity shortage, it will result in transmitting the damages to the broader system.

Current regulatory and market requirements are leading CCPs to implement sophisticated practices to manage the default of one or more clearing members. Nevertheless, the management of non-default losses (NDLs) is also essential from the resilience perspective. The PFMI establishes standards for the management of NDLs, with specific principles for legal, business, investment, custody and, operational risks. In the current paper, NDLs are not discussed in detail; however, regarding resolution and recovery planning, this topic will be covered minimally. *Lewis and McPartland* (2017) highlight that a CCP's choices regarding the management of NDLs can influence the cost of clearing and members' trading activities and, ultimately, a shift in their incentives.

Béres (2018) also points out the undeniable positive effect of CCPs. He analyzes both central securities depositories and central counterparties, and he highlights that the two infrastructures can determine the efficiency of the financial and capital markets by having an indirect effect on the performance of the whole economy.

The primary goal is to reduce risk and also to enforce the resilience of the financial system by avoiding burdening the market participants. Central counterparties mitigate counterparty risk and are prepared to withstand under "extreme but plausible

market conditions." However, CCPs are no panacea, as if distress hits the financial system, CCPs are not an exception of harsh aftermath. While CCPs provide protection against idiosyncratic counterparty risk and serve as safeguards for the system as a whole, they offer no essential protection against aggregate risk and may even encourage risk-shifting (Biais et al., 2016). The default of a CCP, however, becomes a systemic risk, triggering the collapse, or at least weakening resilience (Duffie et al., 2015). Since 1973 there were three significant events of this type, and some near fails as well (Kiff, 2014). These events happened in the commodity markets, mostly because of speculative trades failing because of unexpected weather conditions. Transparency and the risk management tools enhanced since but were never tested before. Their efficiency remains uncertain.

Overview of the regulatory background

The potential threats mentioned can be managed by proper risk management tools, and let us not forget that regulators aim to prevent the development of inadequate managing systems by offering a prudent and rigorous legislative background. The regulation for CCPs in the European Union was published in 2012. The regulation is called European Market Infrastructures Regulation, abbreviated as EMIR. Regulatory technical standards supplement the text of EMIR; these are the so-called "technical details." A total of 9 Regulatory Technical Standards are supplementing the EMIR, while the 3 Implementing Regulations assist the implementation of the law.

Additionally, they are complemented by guidelines helping the interpretation of the law and its application. Moreover, Q&A

(questions and answers) are also issued regularly by ESMA (European Securities and Markets Authority). In 2012, the Financial Infrastructure Recommendations were consolidated, and a framework for their evaluation was created –under the name Principles for Financial Market Infrastructures (PFMI). The recommendations contained in the PFMI were later supplemented by further proposals aimed at the restoration, stability, and transparency of CCPs. The PFMI and the EMIR, although they serve the same purpose - the balance of the financial system – show fundamental differences. The main difference between the two is that EMIR regulates in more detail. However, the PFMI Recommendations have evolved since 2012 but are not fully covered by EMIR. *Váradi* (2018) points out a few reasons why the gap between PFMI and EMIR has widened in recent years.

To assure the proper application of the imposed framework, ESMA, in cooperation with National Competent Authorities, oversees the activity of CCPs under their jurisdiction. Local authorities have the power to require even more stringent rules. The Central Bank of Hungary supervises Hungary's only CCP, KELER CCP. As the supervisory function, the Central Bank of Hungary shall carry out official procedures within the scope of its responsibilities, including authorization processes, official controls, and sanctions for non-compliance. The Capital Market Act and EMIR simultaneously regulate the clearing activities performed by KELER CCP, and the CCP has to ensure compliance continuously. The CCP is part of the payment system, so besides the Capital Market Act, additional decrees provide the infrastructure's technical operation, general safety, and business continuity (MNB, 2009a). Regarding transparency, guarantee rules, risk management, collateral management, principles of determination of fees, the Central

Bank of Hungary also imposes regulations to adhere to (MNB, 2009b). The whole payment system is subject to an annual analysis by the Central Bank of Hungary (MNB, 2019).

The rules and the arrangements are the results of a carefully thought out process, incorporating the experience for over more than a century regarding central counterparty clearing on a global basis. In the following, I will present a general view regarding the financial resources available for CCPs to handle defaults, focusing on the capital of the CCP included in the system.

DEFAULT WATERFALL

The default waterfall is the financial basis of the member default mechanism. It shall be high enough to survive and to protect the system from distress. A so-called Cover 2 rule is set, meaning that the default waterfall should be high enough to cover the losses of its top two clearing members it has exposure to. Both clearing members and stakeholders expect the viability of the CCP. The capital inclusion is the system is from both sides arises; therefore, the stakes are high for everybody. In this paper, the own funds provided by the CCP are in the main focus, while the components of the default fund are subject to a short presentation.

Initial margin and default fund contribution

Regulations require using the available balances in a preordered sequence. Margins are the first layer of financial resources, which the CCP can only apply to cover losses of the defaulting member. Margins provided by the non-defaulting members cannot be used during the exhaustion of the default waterfall. The primary goal of the margins is to cover

potential market losses in the clearing members' positions *in normal market conditions*. (EMIR, Article 41 and Chapter VI). Procyclicality is an additional component that must be taken into consideration. The margining methodology used by the Hungarian CCP is the one proposed by Váradi and Béli (2017), fully complying with the regulatory requirements.

Margins are then followed by the second type of assets, the default fund contribution (EMIR Article 48). The use of the default fund contributions occurs *during stressful conditions*. Regulators require CCPs to implement an internal policy framework for defining the types of "extreme but plausible" market conditions. Besides covering losses to extreme market conditions, at this level appears a cross-guarantee or mutualization of loss between clearing members. Non-faulty members' contributions can be subject to exhaustion if needed, but before this, the third layer will be used. This is the funds of the CCPs, known as the skin-in-the-game (SITG).

Skin-in-the-game

According to Article 35 of EMIR, CCPs must provide a considerable fraction of their equity as skin-in-the-game in the default waterfall system. The level is set to 25%. There are two tranches of SITG's. The junior trench is the 25% set by the regulator, which is used before reaching out to the non-faulty members' default fund contributions. With this commitment, the CCP's management and shareholders too bear the consequences if it is inescapable to apply the CCP's capital buffer (Cont, 2015).

Researchers [Cont (2015), Murphy (2017), and McPartland and Lewis (2017)] point out that in case the waterfall is exhausted and proven to be inadequate, before entering the recovery phase, there should be another SITG, the so-called senior trench. It is not mandatory,

but CCPs may use it to avoid triggering more drastic tools of recovery. They suggest that regulators are the ones who can answer by asking "what level of skin-in-the-game would be sufficient to generate the amount of clearing they consider necessary, were market participants free to choose whether or not to clear any particular trade." Cox (2015) suggests that supervising authorities "*should have the responsibility to ensure that a sufficiently objective and balanced decision is reached.*" While the junior trench is serving as "*an auction inducement and a nuisance-avoidance deductible,*" the senior tranche has the "*ability to replenish the junior (...) to maintain public confidence.*"

Even though the CCP takes its own skin in the game, this capital shall not be a primary resource for loss absorption, otherwise, it would massively alter the incentives of the market participant. Cox and Steigerwald (2017) explain how a significant amount of CCP capital can dilute the mutualized risk characteristic of the CCP, disincentivizing members to support the necessary process of liquidating a failed member's positions, affecting the business model of the CCP. Moreover, the amount of SITG can be harmful if its scale does not fit the risk profile of the CCP by being too high or too low. According to Murphy (2017), if a CCP's capital contribution to the waterfall is too low, clearing members would engage high risk with the clearing activity, leading them to seek trades not subject to clearing. In case the SITG is high, an issue of moral hazard may arise.

DEBATE AGAINST HIGH SKIN-IN-THE-GAME

High SITG has an uncertain impact on clearing activity. Collateral is costly, and a higher level of capital requirement means

that traders must bear higher collateral costs, but an adequately capitalized CCP is more resilient, giving higher certainty for surviving traders, and it imposes lower or nil loss for them. (CPMI-IOSCO, 2012).

Regulators impose strict rules for CCPs aiming for loss-absorption and loss-mutualization. Let us not forget, this layer also motivates the CCP to apply proper risk management to protect the system it clears. Including their own financial resources can discipline the CCP to avoid lax risk management and to prevent the pile-up of risky positions without proper collateral security. Transparent processes and policies can only achieve a resilient and resistant system.

CCP experts have the exact opposite opinion regarding the amount of SITG. CME highlights that “*Skin in the game doesn’t protect end client.*” and points out that concentration risk has a higher threat. It can encourage moral hazard among the clearing members because CCPs contribute more substantial financial resources to the default fund. One way to deal with concentration risk is to penalize the clearing member causing it. The party concerned would pay additional collaterals, so in case of a default, those funds are available to resolve the issues it generated. (Surprise, 2015). Otherwise, the end clients would also suffer from the exhaustion of the CCP’s financial resources. In the long run, this would benefit neither the CCP nor the end clients, especially if the default events accumulate. The protection of the end client, in the CME’s point of view, is not assured by the investments in the guarantee fund by the CCP. It can “*be used to close shortfalls in client account, thereby protecting non-defaulting end clients.*” (Surprise, 2015). Experts explain their standpoint against high skin-in-the-game proportion with the high cost of capital and the incentives of clearing members they are willing to take. However, they agree on the necessity of the

junior tranche because it indicates the first line of defense, and therefore is a strong incentive to promote adequate risk management conventions for clearing activity. *Carter and Garner* (2015) also show the motivations of risk management in case of a default.

The CCP12¹ also states that “*SITG, not a significant loss-absorbing resource.*” Their justification points out that neither CCPs nor international standards expect it to be the essential loss-absorbing tool of the guarantee system. However, they agree on the previously presented concept; namely, a too high value of the SITG “*will weaken market participants’ incentives to participate in the default management process, as they will consider CCP skin-in-the-game and the potential for their own mutualisation when constructing bids in a default management auction*” (CCP12, 2019).

Daly (2015) gave a reason that skin-in-the-game contributions are significant because a potential solution for CCPs to stop a substantial default from happening is to have access to ample resources, and “*clearinghouse contributions would be a perfect place to start.*” Based on the different markets and guarantee funds reported in 2014, the separately managed guaranty funds dedicated to cleared interest rate and credit-default swaps contributed over \$200 million, a maximum of 2.2% of the guaranty fund’s total assets. In Europe, under EMIR, the contribution is 25% of their own capital resources, and they should have a minimum capital requirement higher than 7.5 million euros. The difference resembles between the European and the US clearinghouses’ financial situation.

McPartland and Lewis (2017) get to the conclusion that no matter what the ownership structure of the CCP is, the “*skin-in-the-game should be pre-funded and on deposit with the appropriate central bank.*” This gives relief for every participant in the system because, in this way, the financial commitment from

the CCP is in a pre-funded form, and it is available immediately under the most adverse of circumstances.

Researchers and regulators highlight the interconnectedness between CCPs, and from these perspectives, risks can be correlated across CCPs in several jurisdictions. Due to the possibility of building overlapping international memberships for CCPs, besides the spillover effects, one CCPs may face liquidity problems similar to others in the network they form. Domanski et al. (2015) consider a rare but extreme case if a participant bank would be unable to meet its obligations, being forced into resolution and even to fail, could threaten the resilience of the whole network, including several CCPs at the same time. Socially essential questions may arise because the default of a globally significant participant would promulgate a burden for surviving participants.

THE INADEQUACY OF THE DEFAULT WATERFALL: RESOLUTION AND RECOVERY

Regulators expect these financial market infrastructures to withstand extreme market conditions, but the shock event may be so immense that the CCP's prefunded and callable resources are exhausted and still insufficient to cover the losses. This extreme situation would trigger tremendous uncertainty, altering the value of the underlying exposures, therefore heightening the associated market and counterparty risk for the whole system (Domanski et al., 2015). This is why regulators require CCPs to assure continuity in the provision of clearing services for systemic stability and of an orderly resolution by having prepared recovery and resolution plans on hand [CPSS-IOSCO (2012), CPMI-IOSCO (2014), FSB (2014)].

Recovery planning

The strategy and the default fund composition strongly defines the additional resources to be included in the default waterfall system, and the tools to be used in case resources are still insufficient. The final action a CCP implements to protect the financial systems are recovery and resolution regimes (Cont, 2015).

Peters and Wollny (2018) point out the importance of preparation. The recovery plan is a crucial tool for both CCPs and regulator to be prepared to identify the critical services; the stress scenarios in case of default and non-default events, that may stop the CCP from being able to provide its critical functions. Both quantitative and qualitative aspects of criteria shall be identified to trigger the application of all or part of the recovery plan and the recovery tools. The plan should outline the possibilities the CCP has in various circumstances. The relevant supervising authority must periodically review the plan and assess its adequacy. In the case of significant change on the market or in the regulatory background, it can generate deficiencies leading to the consideration of implementing the plan. This requires a flexible implementation of the plan. However, the set of supervisory intervention is limited. The execution of the plan is solely the responsibility of the CCP. To facilitate the quantification of potential exposure to the CCP, regulators endeavor to enhance transparency by elaborating on the impact in the recovery plan for clearing members.

The general framework of recovery tools provided by the regulator refers to tools to be used in case of a defaulting member and steps to allocate losses not caused by a participant default (CPMI-IOSCO, 2014). In the following, these tools are presented altogether with its characteristics.

Tools for uncovered losses caused by participant default

CASH CALLS (ASSESSMENT POWERS). In a going concern, CCPs can require non-defaulting clearing members to provide additional financial, but only for covering losses due to default. These calls to clearing members should be proportionate to the pre-paid default resources or the market-to-market value of the positions the clearing members bring to the CCP on a given day. To enhance transparency while mitigating uncertainty of the callable cash amount, the European Parliament opts for the possibility of several cash calls, maximized by the resolution authority.

The aim is to reduce the maximum loss that would fall on any individual non-defaulting clearing member by mutualizing the loss in proportion to the risk that the clearing member brings to the CCP. Even more, this approach would provide ex-ante incentives for clearing members to limit the risk they bring to the CCP (Peters and Wollny, 2018).

VARIATION MARGIN HAIRCUTTING BY THE CCP. This is a limited-time tool that involves reducing haircutting - in any variation margin gains/profits due to the non-defaulting members. All claims, either gross or net or only marked to market gains, can be subject to haircutting. The most significant disadvantage is that over time, participants will be unwilling to provide the required initial margin. If the CCP cannot re-establish its clearing activity promptly, further steps should be taken.

USE OF INITIAL MARGIN. As discussion over the initial margin usage in the previous sections stated, it is used to cover the obligations of the provider, and it cannot be used for loss-mutualization purposes. Generally, the initial margin is remote from the insolvency

of the CCP, and it is not subject to a reduction in either recovery or insolvency. If the initial margin of the surviving members is used, they are required to replenish the initial margin and to decrease their exposure at the CCP to the level that their remaining initial margin provides adequate coverage or a combination of both. This recovery tool being implemented could further undermine confidence in the CCP. It would also generate procyclicality in the system. The willingness of the clearing members to meet the margin calls imposed by the CCP will plummet drastically.

Many [EACH (2015), PFMI (2017)] draw precautions to the use of this tool! The primary pro argument for allowing the use of initial margins is the significant level of available resources that the CCP could use. On the contrary, exhausting it would lead to members having posted insufficient collateral, thereby set off for margin calls. ISDA (2013), LCH.Clearnet (2014), EACH (2015) explains how applying this could lead to substantial procyclical effects. This tool would put considerable pressure on the liquidity of the clearing members and even cause liquidity shortages and, ultimately, clearing member defaults (Pirrong, 2011).

OTHER TOOLS THAT INVOLVE COLLATERAL AND CAPITAL. These tools are using the CCP's own capital and, if necessary, raising additional capital. The purpose is to cover losses of a default. This tool can be part of the ordinary default waterfall, or it can appear among recovery or both.

Tools to address uncovered liquidity shortfalls

OBTAIN LIQUIDITY FROM PARTICIPANTS OR THIRD-PARTY INSTITUTIONS. A CCP can have arrangements in place with third-party

institutions. These tools are useful in case of less stressed market conditions. They are less reliable forms of liquidity, but if included in the recovery plan, additional tools should be used to manage liquidity shortfalls in highly stressed events as well.

Two options play here: Requiring participants who are owed funds by the CCP, to the extent of those obligations to provide a collateralized loan, a repo, or a swap transaction. The second option is applying ex-ante rules that permit the CCP to obtain liquidity more broadly from all participants. While the first option benefits from incentivizing participants to follow up on the CCP's risk management, the second option could lead to performance risk.

Tools to replenish financial resources

Cash calls and Recapitalization is to be used.

Tools for CCPs to re-establish a matched book following participant default

FORCED ALLOCATION OF CONTRACTS. The CCP would first try to reach out to voluntary and mandatory tools to achieve a matched book. A CCP can sell the positions to direct or indirect participants the outstanding obligations of the defaulter; it can also buy-in any assets a defaulter has sold but failed to deliver, or the CCP can sell any assets a defaulter has bought but was unable to pay. During a forced allocation process, the CCP fully allocates unmatched positions of the defaulter's contracts to participants that have not defaulted. They can also be compensated, as far as resources allow, for acquiring these contracts.

CONTRACT TERMINATION: TEAR-UP (COMPLETE, PARTIAL AND VOLUNTARY). During complete

tear-up, all positions - matched or unmatched positions – are terminated. There is a possibility to tear-up just some of the positions, or participants can be invited to nominate contracts to end them. By reducing some of the contracts, the CCP will reduce the exposure towards the concerned clearing members and, therefore, it can re-establish a matched book.

Tools to allocate losses not caused by participant default (NDL)

CAPITAL AND RECAPITALIZATION. Raise additional equity capital.

INSURANCE OR INDEMNITY AGREEMENTS. Insurance or indemnity agreements may be an effective way of addressing the impact of specific business losses

OTHER TOOLS. Cash calls, as discussed above. Most demanding and challenging is to define the tools that can be assessed to serve as a recovery tool. The challenge in choosing these tools is to fit the business model, the liability structure of the CCP, but it is vital to notice that some safety tools are already built into CCPs' risk management.

Regulators endeavor to establish the interaction between CCPs and the whole of the financial system as stable as possible. The steps taken are vital in every area, and the progress since the financial crisis of 2007–09 is remarkable from the evolution of the central clearing activity point of view. However, the need for recovery and resolution tools must have objective and prudent regulation as well.

The fail of a CCP would imply that procedures, risk management policies, and safeguard tools, were not prudent enough, or at least they have failed to fulfill their loss-absorbing objective.

Resolution planning

Improving resilience is the most critical aspect. Incorporating liquidity and concentration risk factors in margin calculation methodologies and applying appropriate procyclical buffers are a primary tool. Increasing CCP contributions to the default waterfall to meaningful levels of SITG is particularly critical concerning for-profit institutions. Central counterparties must have effective default management processes.

Nonetheless, enhancing transparency by publishing valuable, standardized, and audited disclosures on CCP risk methodologies, backtesting, and stress testing. Non-default loss event management is also essential; therefore, its manifestation should be supported by appropriately sized regulatory capital requirements. Besides the robust setup of the default waterfall, central counterparties also apply mechanisms, they set rigorous membership criteria, and systematic assessment of members, collateral eligibility, and investment restrictions are also tools help in achieving resilience.

The recovery plan is highly dependent on the design of the default waterfall the CCPs uses. A general approach of a recovery plan is to facilitate the process itself, and it is recommended to use the tools listed above. This list includes the pre-defined assessment rights, more capital of pre-funded CCP resources, variation margin gains haircutting, tear-up of contracts.

Authorities intervene if the resolution plan fails to achieve the desired recovery level to assure continuity of the service providence. The resolution can reach out for tools like ex-ante resources of CCPs that authorities require to set aside.

On 4 December 2019, the European Council adopted a position on recovery and resolution. The proposed framework keeps in

mind the role of central counterparties and their systemic nature. Hence, the Council sets out a 3-step approach to provide coordination between national authorities in the framework of resolution colleges, including prevention and preparation (to identify obstacles to resolvability), timing and intervention (to prevent mass damages), resolution tools (to avoid public support).

Plata (2017) analyzes the protection the recovery and resolution plans provide for CCPs, and he suggests four principles that an active CCP recovery and resolution regime should take into account: the extremeness of a potentially adverse event, the importance of restoring a matched book, incentives and keeping the balance between certainty and flexibility.

CONCLUSIONS

The development of CCPs is driven by aiming to assure the resilience and robustness of the financial system. Regulators and market participants work together to build the most balanced regulatory framework that strengthens the system while allows significant competition on the market. The strategy of the CCP regarding the design of the default waterfall can affect the alignment of the incentives both on the CCP's management and its clearing members. As shown in this paper, incentives created by CCPs – with the inclusion of SITG in the default waterfall - must align the strategy and the risk appetite.

For the mechanism to be entirely predictable and transparent, in my opinion, a CCP should be prepared with the amount of SITG included in the default waterfall that does not create an inverse incentive for clearing members which would decline to onboard the defaulted clearing members, avoiding to

exacerbate the stress on the market. Tight cooperation between the members and the CCP can also increase public confidence in the centralized clearing, which can assure the robustness of the financial system. The European capital market has never experienced a total annihilation. They were not even close to a near-fail scenario. Throughout the

years, lines of defense were created to prevent adverse events, but real circumstances did not test their effectiveness so far. The mechanism has a strict framework, and the tools available should be used in line with the intensity of the upcoming situations. Only adverse events sharpened by the market will prove or contradict CCPs' and the regulations' efficacy.

NOTE

- ¹ CCP12 is a global association of 37 members who operate more than 50 individual CCPs globally across EMEA, the Americas and the Asia-Pacific region.

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