CCP12 PRIMER

ON

CREDIT STRESS TESTING

-

A CCP12 WHITE PAPER

office@ccp12global.com

19F, No. 233 Taicang Rd.
Huangpu District,
Shanghai, China

CCP12

August 2020

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

CCP	Central Counterparty
CE	Current Exposure
CPMI	Committee on Payments and Market Infrastructures
CPSS	Committee on Payment and Settlement System
EMIR	European Market Infrastructure Regulation
FMI	Financial Market Infrastructure
IM	Initial Margin
IOSCO	International Organisation of Securities Commissions
LTCM	Long Term Capital Management
MPOR	Margin Period of Risk
OTC	Over-The-Counter
PFE	Potential Future Exposure
PFMI	Principles for Financial Market Infrastructures
SPOR	Stress Period of Risk

1. EXECUTIVE SUMMARY

Central counterparties ("**CCP**s") have included in their risk management practices regular credit Stress Tests to size and assess the sufficiency of CCPs' resources to absorb losses under extreme but plausible market conditions. If the results of the Stress Tests show, that the losses caused by the potential default of a specific clearing member were to exceed the available collateral (i.e., applicable predetermined coverage standard not met), then additional collateral may be charged. This risk management practice allows the CCP to be better prepared in case of an actual clearing member default. Appropriate Stress Tests are designed to support the safety and stability of not only the CCP but the financial market as a whole.

Stress Tests have to be performed on a daily basis and the Stress Test scenarios are reviewed regularly to also take into account the current market conditions. For instance, during the recent COVID-19 pandemic, some CCPs amended their Stress Testing processes and included scenarios which take into account the market events and volatility encountered during this time.

This paper aims to provide background and context on Credit Stress Testing. It introduces the role and objective of credit Stress Testing in the context of a CCP's overall risk management approach (Section 2), gives a conceptual overview (Section 3), sets out the regulatory expectations on a CCP's Credit Stress Testing framework (Section 4), discusses the different approaches to Stress Testing (Section 5) and finally, describes the independent review and validation of Stress Testing (Section 6).

2. INTRODUCTION

CCPs are critical Financial Market Infrastructures ("**FMI**s"). A CCP is the single counterparty to all its clearing members and guarantees the financial performance of all transactions it clears, even if any of its clearing members were to default. While default events at a given CCP are infrequent, collectively, CCPs globally have encountered cases of clearing member defaults and have been able to manage these due to their robust risk management standards, of which Stress Testing plays an important role.

CCPs are exposed to credit risk – the risk of incurring losses in the event of a clearing member default. Principle 4 on credit risk of the Committee on Payments and Market Infrastructures ("**CPMI**")[1] and the International Organisation of Securities Commissions ("**IOSCO**") "Principles for Financial Market Infrastructure" ("**PFMI**") provides the basic guidance on Stress Testing for credit risk[2].

Credit risk[3] can be classified into two categories of exposures; i.e., Current Exposure ("**CE**") and Potential Future Exposure ("**PFE**"). The PFMI states:

> *"Credit exposure may arise in the form of CEs, PFEs, or both. CE, in this context, is defined as the loss that an FMI (or in some cases, its participants) would face immediately if a participant were to default. PFE is broadly defined as any potential credit exposure that an FMI could face at a future point in time."*[4]

PFE is mitigated by the collateral that a CCP collects from its clearing members. This collateral is generally classified into two categories: i) Initial Margin ("**IM**") which is intended to cover the potential loss arising from a clearing member default with a high degree of confidence (e.g., 99% or above); and ii) a pool of mutualisable collateral.

IM is discussed in greater detail in a white paper[5] published by CCP12 in 2018. IM is what a "defaulter pays" to cover losses on its own account, whereas the default fund is what the "survivors pay" to cover losses of the defaulter. The default fund resources are designed to cover extreme but plausible market conditions where losses of the defaulter exceed the defaulter's margins. These resources are primarily funded by the CCP's clearing members, as well as by the CCP in some cases, in a common pool to form a loss mutualisation arrangement – in this paper referred to as the "default fund"[6]. The total resources available in the event of a clearing member default are utilised in a sequence known as a "Default Waterfall" – the typical structure of the waterfall is outlined in Figure 1. The prefunded waterfall resources are sized to be large enough to cover the potential loss if a pre-determined number of a CCP's clearing member(s) were to default under extreme but plausible market conditions – this is at least the loss of the single largest clearing member, but typically the losses of the two largest clearing members. This paper discusses Stress Testing practices, generally adopted by CCPs, enabling them to appropriately size and

---

[1] Formerly known as the Committee on Payment and Settlement System ("CPSS").
[2] "Principles for financial market infrastructures"; BIS; April 2012; Accessed: 09th of July 2020; (https://www.bis.org/cpmi/publ/d101a.pdf)
[3] In this paper we refer to credit risk caused by clearing member defaults. CCPs are also exposed to credit risk from investment counterparties, custodians, etc.
[4] "Principles for financial market infrastructures"; BIS; April 2012; Accessed: 09th of July 2020; (https://www.bis.org/cpmi/publ/d101a.pdf)
[5] "CCP12 Primer on Initial Margin – a CCP12 White Paper"; CCP12; 5th of December 2020; Accessed: 09th of July 2020; (https://ccp12.org/wp-content/uploads/2018/12/CCP12_White_Paper_Primer_on_Initial_Margin.pdf)
[6] Reserve fund, guaranty fund and clearing fund are terms which CCPs may use instead of default fund.

assess the adequacy of their financial resources in the rare event of a single or multiple clearing member default event(s).
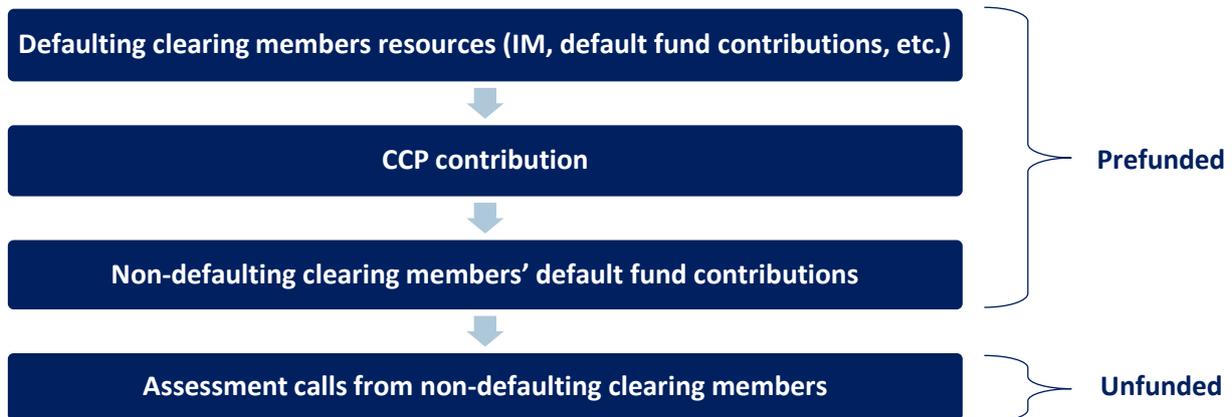
Figure 1: A Typical Default Waterfall of a CCP[7]

2.1   WHAT IS STRESS TESTING?

Stress Testing, in the context of a CCP, is a tool used to assess the effects on a CCP's credit exposure to its clearing members under extreme but plausible market conditions. The default of a clearing member is regarded as a credit event. The impact of a credit event can be mitigated by margins. However, under exceptional circumstances, there could be a simultaneous occurrence of a credit event and a market event (e.g., a clearing member defaults under extreme but plausible market conditions) where margins may not be sufficient to cover the resulting losses. In particular, the resultant losses (see Figure 2) under such circumstances could be higher than the losses covered by the defaulting clearing member's margin and default fund resources. Where this occurs, these losses would be covered using the mutualisable resources of the default waterfall.
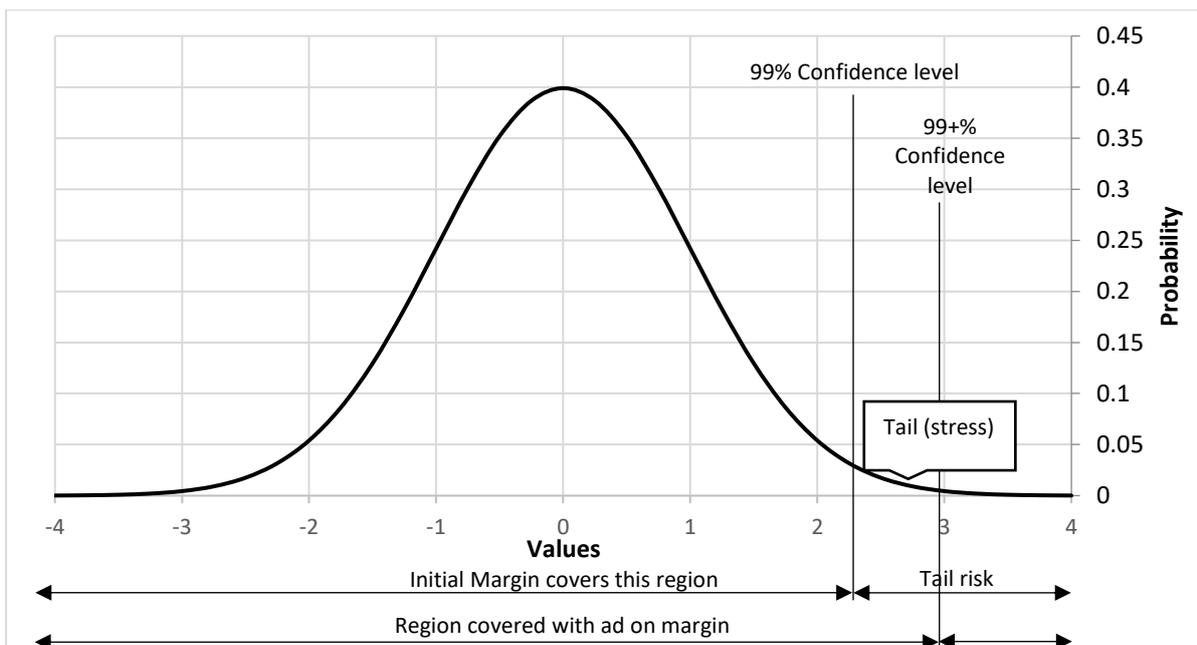
Figure 2: Initial Margin Coverage and Tail Risk

---

[7] See Section 3.3: Client portfolios' gains may not offset any losses in the proprietary account.

2.2 WHY IS STRESS TESTING IMPORTANT FOR CCPs?

The failure of a large hedge fund, Long Term Capital Management ("**LTCM**"), which was triggered by the 1997 Asian Financial Crisis, is an example a market event leading to a credit event. In contrast, the 2008 Global Financial Crisis, exacerbated by the fall of Lehman Brothers, is a prime an example of a credit event leading to severely stressed market conditions.

Stress Testing simulates these types of scenarios by assuming a wide range of extreme but plausible market conditions and their potential impact on a CCP's credit exposure.

2.3 HOW DOES IT FIT INTO CCP RISK MANAGMENT?

CCPs collect IM (plus additional add-ons such as margins to address concentration risk and liquidity risk) as a safeguard against losses arising from a clearing member default. This safeguard provides coverage against clearing member defaults under normal market conditions, and also, to some extent, under stressed market conditions. That being said, if a clearing member were to default under extreme but plausible market conditions, the collateral deposited by a defaulted member may not be sufficient to cover the losses fully. Therefore, CCPs are required to maintain additional resources to cover losses for such tail risk events.

CCP margins are inherently designed to capture a variety of market conditions given the confidence level being set to at least 99%. Further, in order to capture other risks, including potentially the tail risk, a CCP may charge margin add-ons driven by Stress Tests (i.e., margin beyond what is captured in confidence interval for IM), which can increase the stability of a CCP's default fund levels over time and allocate requirements to those clearing members' that are the direct sources of the tail risk exposures.

Stress Testing enables CCPs to determine the quantum of the additional resources required to cover potential losses under extreme but plausible market conditions, in excess of margins. Stress Testing also empowers a CCP to assess the adequacy of its prefunded financial resources on a daily basis. In the unlikely event that the prefunded resources are inadequate to cover the losses in a simulated clearing member default, a CCP may call for additional contributions from some or all clearing members - commonly referred to as "assessment powers"[8].

---

[8] Some CCPs call additional contributions in the form of margins from the members exceeding a certain stress loss based limit, while others may call additional contributions towards the default fund from all non-defaulting clearing members.

3. CONCEPTUAL OVERVIEW

Stress Testing involves evaluating the positions of clearing members over a wide range of stress scenarios. As best practice, the collateral deposits to meet margin requirements are also stressed. In general, the objective of Stress Testing is designed to ensure that there are adequate resources to cover the largest credit exposure in the event a clearing member and its affiliates default (i.e., Cover 1) or the largest aggregate credit exposures in the event two clearing members and their affiliates default (i.e., Cover 2). Key considerations for a CCP's Stress Testing are described in further detail in Section 4.1.

An example of a CCP's credit Stress Testing process could comprise of the following steps:

a. Selecting the relevant market stress scenarios to capture extreme but plausible market conditions;
b. Map instruments of the defaulting clearing member's portfolio to relevant risk factors, which are determinants for portfolio/collateral valuations;
c. Establishing the appropriate level of risk factor changes for the calculation of portfolio/collateral values (i.e., profit or loss) under each market stress scenario; [9]
d. For each market stress scenario, determining the resulting loss after offset of margins (i.e., stress loss less margin) for each clearing member, for its own and client portfolio;
e. For each market stress scenario, determining the aggregate loss at the clearing member level potentially across multiple clearing services if they utilise a common default waterfall; and
f. Determining the loss as per the Cover 1 or Cover 2 standards across all market stress scenarios[10] and assessing the adequacy and sizing of prefunded financial resources against this loss.

3.1 RISK FACTORS

Risk factors are the input parameters used for pricing models to determine the valuation of a transaction or a portfolio of transactions and/or collateral – i.e., what can cause price fluctuations. These include underlying prices, implied volatilities, yield curves, swap curves, and exchange rates, etc. A position could be valued using a single risk factor or a set of risk factors. For example, a coupon bearing bond could be valued using a set of interest rates corresponding to each cashflow date. CCPs sometimes use statistical tools, such as Principal Component Analysis, to transform a large set of related risk factors into a smaller set of factors.

3.2 MARKET STRESS SCENARIOS

As described further in Section 4.2, there are broadly two types of market stress scenarios, historical and forward-looking, each of which in the context of a CCP's Stress Testing are designed to be appropriately extreme but plausible. Historical scenarios capture what could be the loss if the market moves of a historical date were to repeat themselves. Forward-looking scenarios can be divided into hypothetical scenarios and theoretical scenarios. Hypothetical scenarios are scenarios which have not yet happened but could plausibly happen. These scenarios are designed leveraging a CCP's risk management expertise to estimate what could plausibly happen in the relevant market and involve themes or stories supporting stresses to the relevant market. Theoretical scenarios are typically determined by a mathematical

---

[9] Some CCPs use the post-haircut value of collateral, which reflect stressed market conditions as an input to the Stress Testing process. Thus, such CCP would not further reduce the collateral valuation as part of the credit Stress Testing process.
[10] See Figure 1 for illustration.

algorithm or data mining which model market stress scenarios for the given markets. While the labels of historical, hypothetical and theoretical are recognised in the PFMI, CCPs may use blended stress scenarios to cover a complexity of possible scenarios – e.g., supplementing historical scenarios with data from hypothetical events.

Market stress scenarios define extreme but plausible shocks in risk factors, which in turn affect the valuations of a clearing member's positions or collateral. Example of risk factors include, the shift in bond yield curves, the shift in interest rate swap curves, option volatility, and equity indices, etc. Typically, the market stress scenarios represent high intensity shocks over a short-time span, usually ranging from one to five days – known as Stress Period of Risk or "**SPOR**". SPOR corresponds to the expected amount of time required by the CCP to complete the default management process under extreme but plausible market conditions and return to a matched book.

As described further in Section 4.3, one of the most important aspects in designing and performing Stress Testing is to provide for appropriate scenario coverage. Typical CCP Stress Testing scenarios capture a combination of historical and hypothetical stress events. Stress scenarios can include relevant peak historic price volatilities, shifts in market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios capturing a variety of extreme but plausible market conditions, where relevant.

3.3   AGGREGATION

As described in Section 4.1, under a CCP's Stress Testing, the exposures of the client portfolios for the relevant clearing member are aggregated with the proprietary account's exposures of that clearing member, but the client portfolios' gains may not offset any losses in the proprietary account. A clearing member's exposures are aggregated across different asset classes within a single clearing service and for distinct clearing services, a clearing member's losses are calculated separately.

3.4   REQUIRED DATA

The following information can be used to conduct CCP Stress Testing for credit risk:

- Intraday and/or end of the day market data;
- Cleared positions of clearing members and their clients;
- Product attributes such as maturities and cashflows;
- IM requirements and the collateral supporting the required margins;
- Valuation models (e.g., Black-Scholes);
- Factors influencing valuations (i.e., risk factors);
- Stress scenarios and SPOR assumptions; and/or
- Correlation matrices.

4. CCP APPROACH TO STRESS TESTING

There is no single one-size-fits-all approach for CCP Stress Testing. Each CCP follows an approach that complements its risk management framework and is relevant to its products and jurisdiction. Some CCPs adopt different approaches for different products. However, most CCPs follow some common guiding principles, drawn from recognised CCP best practices[11].

4.1   GUIDING PRINCIPLES FOR STRESS TESTING

Some common considerations for CCPs' approaches to Stress Testing are as follows:

- **Risk factors:** CCPs consider potential sources of credit risk that influence the valuation of their cleared positions and collateral deposits. Sometimes, the risk factors are classified as core and non-core risk factors. Stress scenarios are applied directly to the core risk factors, whereas, the shocks on other risk factors are either interpolated or extrapolated from the shifts in the core risk factors.

- **Scenarios:** Stress scenarios are required to be extreme but plausible and relevant to the clearing services and ecosystem within which the CCP operates.

- **SPOR:** The SPOR, or liquidation period, is generally equal to or greater than the holding period (i.e., Margin Period of Risk or "**MPOR**") of the IM model. This follows the rationale that the number of days required to liquidate a portfolio under extreme but plausible market conditions will be equal to or greater than the number of days in which the same could be achieved under normal market conditions. While determining SPOR, CCPs take into account the specific characteristics of the products and markets cleared and potential challenges associated with liquidating or hedging a portfolio in extreme but plausible market conditions.

- **Exposures:** CCPs consider, at a minimum, all outstanding positions at the end of each day for Stress Testing.

- **Collateral:** While evaluating collateral under stressed conditions against potential losses, only the required or encumbered collateral is considered. Any deposits in excess of the requirement are ignored.

- **Segregation of client losses and gains:** Stress losses are aggregated at the clearing member level in accordance with the CCP's client clearing account framework. CCPs evaluate credit exposures for a clearing member's proprietary account and for each of its client accounts separately. The exposures are aggregated at the clearing member level (CCPs have different models in determining how to aggregate clients' exposures according to their own client porting assumptions), while giving due consideration to the degree of protection available for client transactions. As such, a CCP is not permitted to use client margins, which are segregated, to offset

---

[11] "CCP12 Best Practices Paper"; CCP12; May 2019; Accessed: 09th of July 2020; (https://ccp12.org/wp-content/uploads/2019/05/CCP-Best-Practices__CCP12_Position_Paper.pdf)

(i.e., reduce) a clearing member's proprietary losses – such practice would undermine the portability of clients[12].

- **Client porting:** Customer positions of a defaulting clearing member can be source of stress loss exposure to the CCP. However, these risk exposures can be transferred to a member of good standing via a process called client porting. Client porting arrangements can vary between jurisdictions, CCPs and even within a CCP. Given these differences a CCP's assumptions may differ on client porting, but it is an important consideration when CCPs measure the adequacy of their financial resources.

- **Aggregation of exposures across clearing services:** CCPs may operate one or more default waterfalls depending on the number of different clearing services offered. Where different products or asset classes are cleared together, exposures across clearing services are aggregated at the clearing member level for a given scenario. Market data from stressed market periods may be used to model the correlations between various asset classes.

4.2   TYPES OF STRESS SCENARIOS

Historical scenarios are based on historical price movements observed over the SPOR under stressed market conditions and are appropriately adjusted to account for current market conditions (e.g., a change in interest rate regime). CCPs have processes defined for selecting which historical scenario dates, relevant to the individual CCP and the markets it clears, are included in the historical stress scenario set. Some examples of historical stress periods that may be relevant to a given CCP's clearing services include:

- The 2011 European Union Credit Crisis;
- The 2008 Global Financial Crisis;
- The 2007 Inception of Credit Crunch;
- The 1998 Russian Financial Crisis[13]; and/or
- The 2020 Corona Crisis.

Historical scenarios essentially reflect peak historic price volatilities. However, extreme but plausible market conditions that a CCP could face in the future may not be captured in the historical dataset alone. Forward-looking, including hypothetical and theoretical, scenarios allow CCPs to capture risks due to evolving market conditions.

Theoretical scenarios are statistical and are usually data or mathematically driven, while hypothetical scenarios that are forward-looking may be workshop or story board driven based on a CCP's expert risk management judgement. Theoretical scenarios may use statistical techniques, such as Principal Component Analysis, Generalised Extreme Value distributions or Generalised Pareto distributions, which enable CCPs to measure tail risks at very high confidence levels. Examples of types of hypothetical scenarios include:

---

[12] "CCP12 response to Resilience and Recovery of CCPs: Further guidance on the PFMI – Consultative Report"; CCP12; 17th of October 2016; Accessed: 09th of July 2020; (https://ccp12.org/wp-content/uploads/2017/05/CCP12-Response-CPMI-IOSCO-CCP-Resilience-and-Recovery2.pdf)
[13] This scenario is also known as LTCM default scenario.

- Correlation changes whereby techniques are used to increase or decrease the overall correlation among products cleared;
- Implied volatility level and skew changes;
- Changes in interest rate swap and foreign exchange rate levels, curve and slope; and/or
- Idiosyncratic events, such as jump-to-default events, large single stock price movements, and/or currency de-pegging events.

Hypothetical scenarios are also used for modelling stress scenarios for products where there is insufficient historical data (e.g., new or illiquid products). In such cases, scenarios are modelled statistically or using historical data for similar products or asset classes.

Additionally, while modelling hypothetical stress scenarios that are forward-looking in nature, the CCP strives to come up with scenarios which are extreme but plausible and relevant to the instruments which the CCP in question clears. These scenarios are modelled thematically to capture potential future events that could happen, but have not occurred in the relevant market(s). Typical themes that may be relevant to some CCPs include Geopolitical, Environmental, Economic events and/or other events that have been observed in other similar markets.

Hypothetical scenarios that are forward-looking in nature may be very specific and limited in time or others may be more generic in nature. Some specific examples of events these scenarios may capture relative to the themes noted above may include:

- Geo-political events, such as elections, acts of war, trade wars or currency regime change;
- Natural disasters, such as earthquake, tsunami and pandemics; and/or
- Sector shocks.

A CCP clearing securities or derivatives tied to corporate equities or bonds commonly may employ a variety of sector shocks. In these scenarios, a CCP would stress the risk factors for, say the telecommunications sectors along with other related and correlated sectors which could include information technology and semiconductor manufacturing. The shocks in the scenarios typical incorporate movements up and down based on extreme market movement assumptions and the specific narrative of the scenario supporting the economic rationale.

Also, it is important to note that different positions have exposures to different risk factors. While some directional portfolios (e.g., portfolios that are primarily exposed to an increase or decrease in the price of one product or related group of products) are exposed mainly to outright price movements, other portfolios may reflect trading strategies that could present exposure to basis or curve risks (e.g. long and short positions at different points on a forward or yield curve which may be more sensitive to correlation shifts rather than general price movements). A CCP's stress scenario is designed to ensure they adequately capture the risks associated with different trading strategies that may be employed by its clearing members and their clients.

4.3 STRESS SCENARIO SELECTION AND RELEVANCE

Stress scenarios are evaluated for extremity and plausibility. A scenario that is not extreme enough will underestimate potential losses, thereby leading to under-sizing the default fund. In contrast, an extreme but implausible scenario will lead to overly conservative sizing of the default fund. CCPs leverage their market and risk management expertise in establishing the appropriate set of extreme but plausible stress scenarios to use for their clearing services.

Stress scenarios are also regularly evaluated for their relevance by a CCP. Certain historical stress scenarios may be excluded if there is conclusive evidence that such scenarios may not be relevant given structural changes to market fundamentals. However, scenarios are not excluded simply due to the passage of time.

5. FREQUENCY OF TESTING AND ANALYSIS

The PFMI requires Stress Testing to be performed daily using standard and predetermined parameters and assumptions. On at least a monthly basis, CCPs are required to perform a comprehensive and thorough analysis of Stress Testing scenarios, models, and underlying parameters and assumptions used, which is designed to ensure their appropriateness for determining the CCP's required level of default protection in light of current and evolving market conditions.

Additionally, under the PFMI, CCPs are required to perform this analysis of Stress Testing more frequently when the products cleared or markets served display high volatility or when credit risk is perceived to be elevated.

6. INDEPENDENT VALIDATION AND REVIEW

6.1   REVERSE STRESS TESTING

The adequacy of a CCP's Stress Testing can be assessed by evaluating the plausibility of scenarios and circumstances that would exhaust the different layers of the default waterfall to cover the applicable clearing member defaults (known as "Reverse Stress Testing"). Reverse Stress Testing is a key input for reviewing the appropriateness of a CCP's Stress Testing framework. CCP's can perform Reverse Stress Testing in a number of ways, which may comprise:

(i) Including extreme but implausible scenarios by varying the price, volatility, correlation, tenor and other market risk variables;
(ii) Increasing the number of hypothetically defaulting clearing members;
(iii) Adjusting the SPOR; and
(iv) Considering liquidity resources would be unavailable to be utilised.

These types of tests inform the CCP about the resiliency of its resources beyond its normal Stress Testing scenarios. The results of Reverse Stress Testing are not used for quantifying any resource requirement.

6.2   INDEPENDENT MODEL VALIDATION AND REVIEW

A full independent validation of a CCP's Stress Testing framework should be conducted on an annual basis to confirm the accuracy and appropriateness of the Stress Testing methodology. Model validations may be carried out either internally by the CCP's staff that are independent from the model developers or by external experts. Regardless of internal or external parties conducting the validation, the validator should be qualified and independent.

6.3   RISK POLICIES, RISK APPETITE AND GOVERNANCE

As required under the PFMI, CCPs should have explicit rules and procedures to address credit losses in the event one or more clearing member default event(s). A CCP's board of directors has the ultimate responsibility of ensuring that its Stress Testing framework is designed to require and maintain the required level of resources (e.g., Cover 1 or Cover 2 standard) on an ongoing basis. CCPs should have clear procedures to report Stress Testing results to appropriate decision-makers, such as senior management, risk committee, board, and/or its regulator(s).

6.4   DISCLOSURE

Stress Testing results and other relevant disclosures are published by CCPs at the end of each quarter, as per the public quantitative disclosure standards of the PFMI. Additionally, a CCP publishes a qualitative disclosure that describes its Stress Testing, as per the public qualitative disclosure standards of the PFMI.

7. CONCLUSIONS

Credit Stress Tests plays an important role in the risk management process of a CCP, including to size and assess the adequacy of a CCP's financial resources. The scenarios considered within credit Stress Tests whether they are historical, hypothetical, and/or theoretical all have the objective of capturing extreme but plausible market conditions. It is important to note that the Stress Testing frameworks that CCPs employ are dynamic and enhanced as appropriate, for example, this could be through the incorporation of recent stress scenarios, the results from independent validators or through reverse Stress Testing.

The PFMI disclosure standards have enhanced the transparency of CCPs' risk management activities, including for Stress Tests. CCPs make both quantitative and qualitative disclosures on their Stress Tests publicly available.

In conclusion, Stress Testing is a crucial tool within a CCP's toolbox that is designed to ensure the stability, safety, and resilience of not only itself but the wider financial market in which it operates in.

8. REFERENCES

1. Principles for Financial Market Infrastructures, CPSS-IOSCO, April 2012
2. Implementation monitoring of PFMI: Level 3 assessment, CPMI-IOSCO, August 2016
3. Resilience of CCPs: Further guidance on the PFMI, CPMI-IOSCO, July 2017
4. Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on Over-The-Counter ("**OTC**") derivatives, central counterparties and trade repositories ("**EMIR**")
5. CCP Best Practices – A CCP12 position paper, May 2019
6. CCP12 response to Resilience and Recovery of CCPs: Further guidance on the PFMI – Consultative Report

9. APPENDIX

Box 1: Illustration for determining Cover1/Cover 2 Stress Losses

Cover 1 Stress Loss:

Member (and its affiliates)	Scenario-wise aggregate stress loss			
	1	2	3	4
A	100	95	75	70
B	90	110	80	90
C	85	50	85	60
D	88	70	70	50
E	80	60	50	45
Scenario-wise highest stress loss	100	110	85	90
Cover 1= Highest stress loss across scenarios	110			

Cover 2 Stress Loss:

Member (and its affiliates)	Scenario-wise aggregate stress loss			
	1	2	3	4
A	100	95	75	70
B	90	110	80	90
C	85	50	85	60
D	88	70	70	50
E	80	60	50	45
Scenario-wise **sum** of highest & second highest stress losses	190	205	165	160
Cover 2 = Highest stress loss across scenarios	205			

Highest	Second highest

10. ABOUT CCP12

CCP12 is a global association of 37 members who operate more than 60 individual CCPs globally across Europe, the Middle East, and Africa (EMEA), the Americas, and the Asia-Pacific (APAC) regions.

CCP12's mission is to promote effective, practical and appropriate risk management and operational standards for CCPs to ensure the safety and efficiency of the financial markets it represents. CCP12 leads and assesses global regulatory and industry initiatives that concern CCPs to form consensus views, while also actively engaging with regulatory agencies and industry constituents through consultation responses, forum discussions and position papers.

For more information please contact the office by e-mail at office@ccp12global.com or through our website by visiting www.ccp12.org

11. CCP12 MEMBERS