EACH views on portfolio margining

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1. Executive Summary

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This paper aims to provide the views of the European Association of CCP Clearing Houses (EACH) on portfolio margining and to make concrete suggestions about how we believe the current legislative provisions in EMIR can be improved.

EACH believes that the CCPs' risk management framework would be strengthened through:

- **A portfolio margining model** which:
    - Follows a **principles based** approach that targets the final objective (i.e. adequate risk management) rather than a prescriptive way of achieving it (e.g. rules about correlations)
    - **Ensures the performance of the model** through a thorough back testing framework that includes 'micro back tests'[1], together with additional measures such as sensitivity analysis and fire drills.
- **Legislative provisions that are:**
    - **Model-independent** (i.e. they do not prescribe, directly or indirectly, any particular type of risk model).
    - **Reflect the use of risk factors**, rather than the types of financial instruments, to allow risk offsets.
    - **Ensure that risk calculations** with regard to portfolio margining are **consistent with the liquidation procedures.**

The sections below introduce the concept of portfolio margining (Section 2), describe the features of an adequate portfolio margining framework (Section 3) and detail the EACH suggestions on portfolio margining for the EMIR review (Section 4). Section 5 concludes.

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2. Introduction to portfolio margining

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2.1. Introduction

During the financial crisis, central counterparties (CCPs) demonstrated their ability to successfully manage a default and prevent contagion between market participants. This led G20 leaders to propose that transparency and risk management be improved by promoting that all standardised OTC derivative contracts be cleared through CCPs.

CCPs have the responsibility to continuously improve CCP risk management for the benefit of the wider market and hence society, given the effect that an unstable market can have on taxpayers and society as a whole.

The CCPs' default waterfall comprises lines of defence that incentivise the CCP and its participants to ensure prudent risk management. Skin in the game is the component of the default waterfall contributed by the CCP. With their own funds at risk

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[1] Tests at the small portfolio level (e.g. outright positions and commonly traded spreads), in addition to tests at client or clearing member level.

immediately after the defaulter's are exhausted, CCPs have a clear incentive to ensure margin, default fund contributions and other risk management requirements are conservative.

CCPs more specifically manage systemic and idiosyncratic exposure based on market best practice to enhance diversification and the mutualisation of risk. Portfolio margining is a centrepiece element to create the right incentives for market participants to control and limit their risk, and have appropriate requirements to cover outright directional and concentrated exposure.

2.2. What is portfolio margining?

Portfolio margining is the process of calculating the amount of margin required for a collection of positions that constitute a portfolio. It represents an alternative to an evaluation of exposure at the individual position level, which would ignore the potential benefits that other positions may bring by limiting directional exposure and/or by improving the diversification of the overall portfolio.

Portfolio margining therefore represents a margin construct which considers the co-movement of the profit and loss of the portfolio constituents. In doing so, portfolio margining provides a much more accurate estimate of the likely worst case loss (to some defined statistical confidence level) of the overall portfolio. The improved accuracy of portfolio margining reduces the liquidity constraints caused by margin.

2.3. What benefits does it bring?

Applying the principles of Modern Portfolio Theory[2], portfolio margining encourages **diversification, a risk management technique that mixes a wide variety of investments within the portfolio and** reduces its risk (variance) for the same expected return. In this sense, a weak or nonexistent economic relationship between two financial instruments or risk factors, implied by a small or even zero correlation coefficient, is important to assess the portfolio risk. Furthermore, negative correlations are relevant in determining the portfolio risk, e.g. a bear European Stock Index ETF will be negatively correlated to the underlying assets composing this index and should be factored in when determining the portfolio risk. Clearing a well diversified portfolio should attract lower margin requirements than portfolios that are directional and/or display concentration features, hence portfolio margining is a useful approach, supporting the efficient use of capital.

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[2] Portfolio theory is rich in academic literature and is commonly applied in the world of finance. The concept was first introduced by Harry Markowitz (1952 and 1959) and further independently refined with the Capital Asset Pricing Model (CAPM) by Jack Treynor (1961, 1962), William F. Sharpe (1964), John Lintner (1965) and Jan Mossin (1966). Risk models do apply the concepts from portfolio theory, but have until recently been restricted by data size and computation speed. Technological advances have enabled the broad use of SPAN-risk models (Standard Portfolio Analysis of Risk) introduced by the Chicago Mercantile Exchange in 1988, which is a portfolio margining method that using grid simulation and portfolio Value-at-Risk (VaR), which emerged as a concept in the late 1980s, cf. Jorion (2006).

Through portfolio margining, CCP members and clients gain **incentives** to have a balanced exposure and consequently reduce the inherent risk of directional exposure. Portfolio margining also contributes to ensuring an adequate level of liquidity in the market and therefore a fluid financial system as a whole by ensuring margin levels are efficient and commensurate with the risks in the portfolio.

The benefits of portfolio margining are detailed below:

- **Incentives for risk reducing behaviour**

  If a clearing member defaults the CCP has to liquidate the portfolio with the member's own positions (the house portfolio), as well as potential clients portfolios. Margin collateral provided by the clearing member is the first line of defence used to cover losses resulting from the liquidation.

  The main driver for potential losses is the market risk and the value of a portfolio can rapidly change if the markets becomes volatile. The better the portfolio is hedged against potential market moves, the less likely it is that the CCP will face large losses driven by market stress events. The **CCP therefore has an interest to incentivise well diversified portfolios**. Those portfolios which are not sufficiently diversified and directional are assessed to be more risky by the model and therefore require higher margin contributions.

  The prerequisite for penalising directional portfolios and rewarding well diversified portfolios is to identify natural hedge effects within it.

- **Suitability for an increasing diversity of products**

  The number and the nature of financial instruments which CCPs are currently dealing with has expanded significantly compared to twenty years ago. In particular after the 2008 financial crisis, the clearing of a subset of OTC derivatives, such as Interest Rate Swaps came into focus by regulators and has become mandatory in some jurisdictions. It is likely that the range of cleared configurable (OTC) products will expand over the forthcoming years. As a result, **CCPs need to employ risk models which can support these products by modelling their complexities in a more accurate way**.

  Portfolio based models avoid this assumption by looking at risk factor scenarios based on joint (e.g. historical) movements rather than applying fixed shifts. This approach allows a more flexible handling of complex risk factors and produces much more accurate results. It also works just as well for more simple products.

- **Limit excessive drainage of liquidity in the market**

  Many factors affect the amount of offset added by portfolio margining techniques. Various models exist: some capture a static and explicit relationship between risk factors while others better account for the relative implicit dynamic across the risk

factors composing the portfolio. A more accurate representation of the risk across portfolio risk factors not only reflects how such a portfolio would be managed in a default situation (which aims at stabilising the risk sensitivity of the defaulted portfolio) but also avoids having a polarised market on each individual risk factor, which could result in a less diversified and therefore riskier exposure. **This would avoid requiring excess collateral to cover the extra exposure**. This excessive demand impacts the price and risk of collateral and drains cash resources which could be better used for productive activity and increase the necessary monetary velocity to promote growth.

2.4. Distinction between margining and default fund stress-testing

<u>**Margins – Covering market conditions up to a defined confidence interval**</u>

The margin model provides an answer to the question 'what is my worst case loss to a given confidence interval (e.g. 99%)?' This amount of resources will be held as initial margin. Margining is therefore associated with 'stressed' market conditions whilst the scenarios used to size the default fund are associated with potentially more severe 'extreme but plausible' market conditions[3].

The margin collateral posted by the clearing members is one out of several lines of defence that CCPs currently have in place. The only situation where the clearing member's collateral may be used by the CCP is under the declaration of a default of that clearing member, to cover the loss that may arise from the liquidation of that member's portfolio. As the margin is calibrated to cover losses up to a certain confidence level, additional lines of defence are in place to cover losses beyond that confidence level (e.g. exceptional spikes in prices, correlation moves that have not been observed in the past).

<u>**Default fund – Covering market conditions beyond a defined confidence interval**</u>

The default fund of a CCP is used to protect the CCP and its members against scenarios beyond the defined confidence interval covered by the initial margin. Every clearing member has to contribute to that fund where the overall size is calibrated by stress tests.

The EMIR regulatory technical standards on requirements for central counterparties[4] ('the EMIR RTS') include explicit provisions around the scope and type of the stress scenarios which should be used for the calibration of the default fund. The underlying assumption of the calibration exercise is that a certain number of clearing members can default simultaneously. The size of the default fund is then driven by the sum of the largest net losses across the stress scenarios with respect to the number of assumed defaults.

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[3] The 'extreme and plausible' concept is discussed in the EACH paper 'Best practices for CCPs' stress tests' published in April 2015 www.eachccp.eu
[4] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:052:0041:0074:EN:PDF

The default fund sizing would include scenarios which are extreme (i.e. where market moves occur beyond the confidence level covered by initial margin) but which nevertheless remain plausible. In a recent paper[5], EACH proposed the use of a model that targets a minimum level of confidence of 99.9%, in order to generate comparable magnitude of shifts across products in terms of level of extremeness and plausibility.

It is therefore important that a robust set of alternative correlation scenarios are included in the CCP's default fund calculations. However, a CCP should not be compelled to charge *initial margin* for these scenarios, as this is consistent with the treatment of 'extreme but plausible' outright market moves.

The exception to the rule that the CCP should include alternative correlation scenarios in the default fund is if a CCP's margin model is operating a sufficiently conservative approach to correlations that it effectively embeds stressed correlation assumptions into the initial margin figures.

Link between margins and stress testing

EMIR specifies the level of a CCP's total financial resources. CCPs are however free to hold margin to a higher standard if they feel compelled to alter the balance between mutualised and demutualised resources. This interplay between the initial margin and default fund can be detailed as follows:

- **Impact of essential model parameters (e.g. confidence level)** - If for example the target confidence level for the margin is increased, the size of the default fund is likely to be reduced. A higher confidence level generally results in higher margins, which in turn lead to more risk being covered by the individual members rather than by the clearing member community through the mutualised default fund. Less mutualisation also means less incentives for clearing members to participate in the Default Management Process and less overall capital efficiency.

- **Impact of the model structure** – The floors or caps that may be used to make the margin model more stable and less procyclical impact the interplay between margin and default fund.

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[5] EACH paper 'Best practices for CCPs' stress tests' published in April 2015 www.eachccp.eu

3. Features of an adequate portfolio margining framework

3.1. Best practice for portfolio margining and portfolio liquidation

3.1.1.Principles for portfolio margining

Based on the above, EACH members believe that an adequate portfolio margining framework should comply with the following principles:

- **Safety** - Potential losses should be calculated to a high confidence level, independent of the model used. The model should cover the entire range of risk factors to which it would be exposed in a default[6]. The CCP should also ensure that the model appropriately accounts for risk factors which may not have changed (or have been extremely stable) during the historic dataset but which might move in a default[7].
- **Efficiency** - The margin calculation should take into account offsetting risks to incentivise well hedged portfolios. It should however be consistent with the liquidation procedures under the Default Management Process.
- **Accuracy** – The primary aim of a portfolio margining approach is to evaluate, as accurate as possible, the loss on the portfolio based on some defined statistical confidence. The CCP should ensure that the historical data it uses is of good quality (e.g. it does not have any material errors or gaps). The margin model captures a suitably wide range of scenarios. The margin model gives consideration to inherent leverage.
- **Stability** – A portfolio margining framework should include adequate methods to avoid excessive procyclicality.
- **Robustness** - The margin model should be subject to a strong model testing program (performance back tests, sensitivity tests and statistical tests for model error). The margin model must meet its defined percentage standard and be durable over the relevant holding period

Correlations may not be significant, reliable or resilient under stress. However this is only one of several relevant factors to consider. EACH believes that with a suitable model, it is possible to portfolio margin safely without meeting these correlation-based tests, provided the other criteria described above are met. What *is* important is that portfolio margining benefits should only be provided to the extent they are in line with historic observations and to the stated confidence interval of the CCP.

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[6] For example basis risks and (for option products) higher order risks to capture the non-linear behaviour should be included and accurately modelled

[7] For example a pegged currency may show an extremely low volatility in a historical simulation but this is unlikely to reflect the behaviour in a worst case scenario to the defined confidence level. A suitable add-on to the pure historical simulation figure would be expected in such cases.

3.1.2. Consistency of portfolio margining with the liquidation of the portfolio and default management

EMIR requires CCPs to strictly define a process to manage a clearing member's default, the so called Default Management Process.

Should the CCP not be in a position to swiftly and easily close-out the positions of the defaulting clearing member (including the realisation of any assets), then the key components of the Default Management Process would consist of: **hedging**, which aims to neutralise the overall risk of the defaulter's portfolio as quickly as possible (protecting the CCP and its participants against any further market moves); and/or the **auction process (or similar)[8],** which transfers the position (risk) inherited from a defaulted clearing member to other members willing to absorb it. The hedging and auction processes may be used to differing degrees depending on the product or market being cleared.

In the event of a clearing member default, the CCP's objectives are:

- To minimise disruption to the wider market
- To protect the lines of defence[9]
- To protect the defaulting clearing members clients' positions and collateral
- To protect the surviving clearing members' positions and collateral and those of their clients

In order to achieve these goals it is essential that the risk calculation of the CCP is consistent with its liquidation procedures.

The choice of instruments eligible for portfolio margining should follow the respective default management assumptions and procedures. Initial margin should be representative of the close-out risk on a portfolio. **Financial instruments (e.g. government bonds, interest rates, etc.) should be margined together if** the CCP is confident that this grouping can be **hedged as one portfolio of risk during a default and/or auctioned in a reasonable period of time, as applicable.**

Applying this methodology would allow CCPs to comfortably margin, for example, all rate products in a single portfolio, as these products would be hedged in a default as a single portfolio by a single group of rate market experts. This is necessary in order to ensure that the portfolio's risk can be effectively mitigated within the stated holding period. CCPs would not, for example, apply full portfolio margining to a portfolio spanning multiple financial instruments, e.g. rates and equities. To hedge such a portfolio would effectively require two sets of traders, two risk reports and would

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[8] A process similar to an auction could for example be a book building process through which a bidding process is performed by a third party, such as a broker dealer.
[9] The lines of defence of a CCP are the set of pre-funded resources available in the event of a member default. The EMIR Legislation defines the following lines of defence: resources of the defaulting member (variation margin, initial margin, contribution of the defaulting member to the mutualised default fund), CCP's skin in the game, contribution of non-defaulting members to the mutualised default fund.

effectively become two close-out processes. It would therefore be inappropriate to model the close-out risk as a single portfolio.

3.1.3.Auction Based Liquidation vs. Line-by-line liquidation

The above mentioned auction process is conducted for portfolio units with respect to liquidation groups, as opposed to the line-by-line liquidation procedure which is generally used for a subset of portfolios, whereby positions are liquidated subsequently one after the other via the order book. This is however not suitable for large, complex portfolios of particular instruments e.g. OTC products. In these portfolios the risks tend to be approximately fungible (i.e. through grouping or bucketing risks) but not at a detailed level. Such portfolios therefore lend themselves to an approach whereby **the *overall* risks are hedged and then the detailed, hedged portfolio is auctioned rather than being unwound trade by trade**.

Grouping positions into sub-units of portfolios which can be priced, hedged and sold as part of the same process, provides a more effective approach and does not rely on an order-book. The portfolio-based margining approach shares the idea of a joint handling of positions, whereas the product-by-product based models reflect the line-by-line liquidation approach.

3.2. Model performance

3.2.1.The model should target the final objective (i.e. adequate risk management) rather than the means (e.g. rules about correlations)

The margin model has to respect the Default Management Process i.e. the methodology has to match the situation a CCP faces in a default scenario. The margin model should aim to be accurate and conservative.

In order to ensure adequate portfolio margin cover, the model should target adequate risk management and should not be excessively pro-cyclical. The reliability of the model is controlled by a **sound model validation framework**, including:

- Back testing;
- Sensitivity testing; and
- Default management fire drills.

These measures are detailed in the following sub-section.

3.2.2.Measures to ensure the suitability of the portfolio margining model

Back testing

Back testing is the primary control through which a CCP ensures that its margin model is performing as expected, and that the assumptions within the model are valid.

Back testing analyses whether the number of losses greater than the estimated market risk is consistent with the target confidence level using statistical tests. It is effectively an ex-post analysis of the model's performance.

A CCP should assess the adequacy of its margin daily, and the testing periods should match the holding period that the CCP uses for default management (i.e. the length of time the close-out process is expected to take).

There are several ways to undertake back testing. The differences usually lie in the calculation of the actual observed profits and losses (P&L). Market prices or model prices (for e.g. OTC products) may be taken for the P&L calculation. It is generally recommended to use market prices instead of model prices where possible.

If the model performance is less than the CCP's confidence interval over a suitable look-back period at the overall level, then the CCP should take prompt action to investigate the reason(s) for any underperformance (e.g. could be poor quality historical data, or a significant shift in market behaviour from historic precedent) and adjust its margin levels accordingly to account for this.

A back testing regime should examine the performance of the same scope of products that are cleared by the CCP.

EACH proposes that **CCPs perform and report 'micro back tests'** (i.e. Tests at the small portfolio level (e.g. outright positions and commonly traded spreads), in addition to tests at client or clearing member level). 'Micro back tests' should be performed in order to demonstrate that the CCP's margin is sufficiently robust/sophisticated to handle any instances of weak and/or unstable correlations. The back testing window should include periods of market stress taking into account the lookback period used for calculating the margin requirement.

At a more granular level, the following may be considered:

1. an aggregate on all portfolios for all days
2. a selection of representative portfolios
3. small portfolio level, e.g. outright positions and commonly traded spreads

Based on the tests 1-3 above it should be possible to determine whether a margin model is functioning below, within or above the stated confidence level.

Sensitivity testing

A strong sensitivity testing regime evaluates the model assumptions and tests the current choice of model parameters. As indicated in the EMIR RTS Article 50(3) 'sensitivity testing and analysis shall be designed to test the key parameters and assumptions of the initial margin model at a number of confidence intervals to determine the sensitivity of the system to errors in the calibration of such parameters and assumptions'.

Default Management fire drills

From a more qualitative point of view the model can be challenged by a 'fire drill'. Although fire drills are technically not a measure for suitability of the model, they support the model assumptions from an operational point of view.

4. EACH suggestions on portfolio margining for the EMIR review

4.1. Introduction

EMIR article 41(5) requires ESMA to develop draft RTS's that specify the conditions under which portfolio margining practices referred to in 41(4) can be implemented. Article 41(4) specifies that 'A CCP may calculate margins with respect to a portfolio provided that the methodology used is prudent and robust'.

The EMIR RTS, and in particular Article 27, suggest that the regulator's perception on the type of models used by CCPs differs from some industry standards, thereby favouring less accurate/adequate models for certain types of financial instruments, resulting in mispricing of the cost of clearing.

Article 27 contains requirements of a qualitative and a quantitative nature:

- Qualitative - Offsets should be justified by an economic rationale.
- Quantitative - Evidence should be provided in terms of correlations.

With regard to the qualitative requirements, the economic rationale is currently only required in terms of meaningful price relations. However, the essential requirement for margins and liquidation procedures to be compatible is not mentioned. As described in the previous section, **it is crucial that the risk calculation and the liquidation procedures match, in the sense that offsets are only allowed between financial instruments which can be handled jointly in the liquidation process.**

In terms of quantitative evidence, **choosing correlations as the measure suggests that the regulator's view on risk models is still very much focused on product-by-product type models**. For these models, correlations play an explicit role, whereas for some portfolio based margining models such requirements may not be suitable.

Product-by-product type models have to focus on correlations, in order to aggregate margins from product level to portfolio level. Offsetting effects are introduced artificially by arguing via common underlying assumptions or correlations between products. In the calculation of the initial margin at the portfolio level, correlations between financial instruments are projected within different scenarios. However, many portfolio-based models are sophisticated enough to model accurately a variety of correlation behaviours without making any assumptions about the strength or stability of the correlations. The accuracy of such models can represent a dramatic improvement on non-portfolio based models and therefore the EMIR articles *should* allow CCPs to take such an approach.

Therefore, EACH believes that choosing correlations as a metric to measure the adequateness of the margin at a portfolio level can be misleading for portfolio margin models. The main instrument for the assessment of the initial margin at a portfolio level should be historical back testing.

In the example of VaR calculations used for determining regulatory bank capital requirements, the time series for every business line across a bank, whether it be equity derivatives, commodity or fixed income, are generally added together in a way that provides full risk offset and diversification benefits across all asset classes. Furthermore, the regulations governing bank VaR models do not require any comparable tests on strength, stability or resilience of correlations to be met before taking a portfolio margining approach. Whilst bank capital is different from margin, the principle of diversification of risk is common to both.

It is also important to take into account that in a global market, such as the derivatives market, any modifications to the current legislation should avoid the possibility for regulatory arbitrage across different jurisdictions.
In order to address our concerns, EACH proposes the following modifications to Articles 27.1, 27.2, 27.4 and 49.

EACH proposal for Article 27.1 and 27.3 of the EMIR RTS

The current regulation does not allow financial instruments to be portfolio margined together unless their correlations are significant, reliable and resilient under stress. EACH would broaden the current regulation to allow portfolio margining to take place for instruments which do not meet these statistical criteria, provided:

- The CCP is able to demonstrate that its margin model is sufficiently robust to prudently model the risk of the financial instrument even when correlations may not be significant nor reliable. The main tool to accomplish this is back testing, including 'micro back tests', which are tests at the small portfolio level (e.g. outright positions and commonly traded spreads), in addition to tests at client or clearing member level.
- The CCP can demonstrate that the group of financial instruments to be portfolio margined can be hedged as one portfolio of risk during a default and/or auctioned in a reasonable period of time (as applicable), consistent with the liquidation process.

EACH proposal for Article 27.4 of the EMIR RTS

- EACH would like to make it clear that, provided the above conditions are met, a CCP may recognise greater than 80% of the offsets provided by its model. If the above conditions are not met then the maximum amount of offsets that a CCP could provide would be limited to 80%.

EACH proposal for Article 49 of the EMIR RTS

- To require the CCPs to provide evidence that the target confidence level is achieved overall for aggregated results on portfolio level.

The above proposals are justified in sections 4.2 to 4.4 below.

4.2. Article 27.1 - 'Significantly and Reliably Correlated'

Article 27.1 states:

'CCP may allow offsets or reductions in the required margin across the financial instruments that it clears if the price risk of one financial instrument or a set of financial instruments is significantly and reliably correlated, or based on equivalent statistical parameter of dependence, with the price risk of other financial instruments.'

Reliability of correlation - a questionable term
Shorter look-back windows demonstrate a more volatile correlation and longer windows demonstrate a less volatile correlation. The correlation between any two underlying instruments can be made to look 'reliable' if we use a long enough window and 'unreliable'

if we use a short enough window. Choosing an arbitrary window length leads to results which are contrary to an adequate risk management framework. It is important is that portfolio margining benefits should only be provided to the extent they are in line with historic observations and to the stated confidence interval of the CCP.

Significance of correlation – a concept which is difficult to define in a margin model
The regulation does not define what level of correlation is deemed sufficient or how one is supposed to measure it. However we believe that to do so would crystallise this rule in an arbitrary way and be extremely challenging to implement for many portfolio model types. **EACH believes that even if two financial instruments have low or non-existent statistical correlation they can be safely portfolio margined, provided the other conditions set out in this paper are met**. Even completely uncorrelated positions can provide a significant diversification benefit and this should be recognised in the CCP's margin model.

4.3. Article 27.2 - Correlation to be 'reliable' and 'resilient' over the look-back period

Article 27.2 states:

'The CCP shall document its approach on portfolio margining and it shall at least provide that the correlation, or an equivalent statistical parameter of dependence, between two or more financial instruments cleared is shown to be reliable over the lookback period calculated in accordance with Article 25 and demonstrates resilience during stressed historical or hypothetical scenarios. The CCP shall demonstrate the existence of an economic rationale for the price relation.'

As stated above, EACH believes that the concepts of 'reliability of correlation' and 'resilience of correlation' are questionable. These terms have an ambiguous intuitive feel and are difficult to make precise.

When stress events occur, correlations generally increase, as they tend to track volatility. Breaking up portfolios into separate pieces due to perceived lack of 'reliability' or 'resilience' incentivises clearing participants to ignore the related diversification benefits. This is contrary to ensuring adequate systemic risk management.

4.4. Article 27.4 - Only 80% of calculated risk offset across 'instruments' is allowed

Article 27.4 states:

'Where portfolio margining covers multiple instruments, the amount of margin reductions shall be no greater than 80 % of the difference between the sum of the margins for each product calculated on an individual basis and the margin calculated based on a combined estimation of the exposure for the combined portfolio. Where the CCP is not exposed to any potential risk from the margin reduction, it may apply a reduction of up to 100 % of that difference.'

EACH members have strong reservations about the statistical accuracy of the provisions under article 27.4. It appears that regulators have taken different interpretations of the rule, generally assuming that the risk offset is limited to 80%, which in our opinion is not what the legislation states.

Portfolio based risk models use risk factors (rather than classes of financial instruments) as basic inputs on the market data side. These risk factors are fundamental risk drivers in the markets: FX rates, stock movements or interest rate changes. They can be identical to actual products as in the case of shares or equity futures, but this does not necessarily have to be the case. Furthermore it is not clear how portfolio models based on a Principle Component Analysis (PCA) approach align to article 27.4.

At a granular level, we can understand that market participants would support limiting risk offsets across *completely different* 'financial instruments' to 80% (like CDS versus base metals, or commodities versus rates). This interpretation of 'financial instrument' in the context of Article 27 would then be limited being a group of products that can be managed as one portfolio in a default. We are concerned that ESMA's interpretation was slightly different, allowing 80% of risks offsets across 'financial instruments', meaning that a futures contract versus a 100 delta call option on the same underlying could have at most 80% risk offset, which in our opinion limits prudent risk management.

However this has also been interpreted to mean that only 80% of risk offsets between crude oil and natural gas is allowed, so the rule is not applied consistently across CCPs.

5. Conclusion

This paper aims to contribute to improving the current portfolio margining framework outlined in EMIR. It is the view of EACH members that the current provisions should be improved to become model-independent. Provided the model is **safe, efficient, accurate, stable and robust,** a CCP should be allowed to use a portfolio margining approach. In fact, due to the greater liquidity efficiencies that result for the financial system, **such an approach should be actively encouraged**.

As described in this paper, EACH believes that EMIR Article 27 can be improved by re-focusing the regulation from standards around correlation to standards articulating the factors which are truly important when constructing a margin model for a portfolio of trades.

Correlations between financial instruments or risk factors may not be strong, stable or resilient under stress. However this, on its own, should not prevent a CCP from applying portfolio margining provided other relevant criteria are met.

We are conscious of the need to ensure that an improvement to the current rules is adequately delivered for CCPs and within an appropriate timeframe so as to address the issues being faced with the status quo.

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