

**Subcommittee on Securities and Futures
(Futures Contracts) Notice 2012**

**Information provided by the Administration in response to
Members' requests at the meeting on 22 May 2012**

**1. Information in respect of the proposed voluntary clearing of
over-the-counter ("OTC") derivatives transactions**

**(a) Steps to be taken for the establishment of a local central
counterparty (CCP) for the voluntary clearing of OTC
derivatives transactions, and the expected timeframe**

The Hong Kong Exchanges and Clearing Limited (**HKEx**) has established a new Hong Kong-incorporated subsidiary to provide clearing services and to act as a CCP for the clearing of OTC derivatives transactions (**the OTC CCP**). The CCP will be operated independently of HKEx's existing clearing houses, and supported by its own OTC-clearing focused operations department and risk management department.

The OTC CCP will have its own set of clearing house rules and procedures and membership agreement. HKEx has prepared draft rules taking into account the latest recommendations published by the Committee on Payment and Settlement Systems (**CPSS**)¹ and the Technical Committee of the International Organization of Securities Commissions (**IOSCO**) in their report entitled *Principles for Financial Market Infrastructures* dated April 2012 (the **PFMI Report**), which reflect lessons learnt from the recent financial crisis and represent international regulators' consensus on the standards that should apply to CCPs and other financial market infrastructures around the world in order to improve financial stability. The SFC and HKMA are members of the CPSS-IOSCO steering group on the PFMI report. An extract of the overview of principles and responsibilities of the PFMI report is attached at **Annex 1** for Members' reference. The relevant parts of the PFMI report are described in more detail in Item 1 (e) below.

The OTC CCP has also taken into account the rules of comparable CCPs in overseas jurisdictions where

¹ CPSS is a committee set up by the Bank of International Settlements.

appropriate, as well as the rules and provisions, layout and drafting convention of HKEx's existing derivatives clearing houses.

On development of the clearing platform, HKEx has entered into an agreement with a system vendor, Calypso Technology Inc (**Calypso**) to implement the OTC derivatives clearing system for HKEx. Calypso is selected as the system vendor after careful screening and its clearing house system is widely used in other markets. Hence, some market participants are familiar with Calypso's system functions. The system implementation is in good progress and the vendor is now working on the design and development phases. According to the system implementation schedule, user acceptance testing will start in Q3 2012. This will be followed by market rehearsals involving all potential clearing members in September, and the production go-live date of the system is targeted to take place in Q4 2012.

To enable the OTC CCP to commence operation by the end of 2012, the following key processes and milestones would be essential in meeting the timetable -

Event	Targeted date
Enactment of the Securities and Futures (Futures Contracts) Notice 2012	June 2012
Negotiation with potential clearing members	June-August 2012
Finalisation of the operational model, risk management framework, and documentation including its rules, procedures and membership agreement	July 2012
Completion of the clearing platform development	Q4 2012
Recognition of the OTC CCP by the Securities and Futures Commission (SFC)	Q4 2012

The enactment of the Securities and Futures (Futures Contracts) Notice 2012 is key to the above timetable,

because it would establish a legal framework for the regulation of CCPs established in Hong Kong for clearing of OTC derivatives transactions as a “recognized clearing house” (RCH)² under the Securities and Futures Ordinance (SFO), and ensure that clearing of OTC derivatives transactions with the CCP would benefit from the insolvency protections offered to RCH under the SFO. Such legal framework and insolvency protections are key factors in market participants’ decision to join a CCP for the voluntary clearing of OTC derivatives transactions. It should be noted that other countries such as the UK and Singapore already have in place a similar legal framework and insolvency protections for voluntary clearing of OTC derivatives transactions.

Therefore, market participants may not seriously consider joining the OTC CCP as clearing members until such fundamental legal and regulatory aspects governing the OTC CCP are in place. Without the active participation or commitment from potential clearing members at an early stage, the OTC CCP would find it difficult to complete its clearing member on-boarding process in time for launch at the end of this year, since the review of clearing rules and procedures and the on-boarding process require significant commitment of time and resources on the part of the prospective clearing members, and the process is likely to take several months to complete.

As such, any delay to the enactment of the Securities and Futures (Futures Contracts) Notice 2012 could lead to potentially significant delays to the timetable of the OTC CCP’s establishment.

(b) Procedures for the SFC to approve a local CCP and authorise the latter to provide clearing service for specific types of OTC derivatives, and the relevant considerations and criteria involved

The SFC will regulate CCPs established in Hong Kong for clearing of OTC derivatives transactions as a RCH.

Before approving a CCP as an RCH, the SFC must be satisfied that it is appropriate to do so in the interest of the

² A “recognized clearing house” means a company recognised as a clearing house under section 37 of the Securities and Futures Ordinance.

investing public³ or in the public interest, or for the proper regulation of markets in securities or futures contracts. The SFC may also attach conditions to the approval as it considers appropriate. Before granting such approval to a CCP, the SFC must first consult the Financial Secretary (see section 37 (1) and (2) of the SFO).

Rules of an RCH or any amendment thereto must be approved by the SFC (see section 41 of the SFO). A key consideration of the SFC in approving a CCP as an RCH is the robustness of the CCP's risk management measures as well as operational capability. The SFC will not approve a CCP unless the SFC concludes that its risk management measures are robust, such that the risks it bears can be prudently managed.

The SFC will require the OTC CCP to comply with the new global standards in the PFMI report and to have in place plans that cater for distressed market conditions.

The PFMI report sets out twenty-four principles which apply to systemically important payment systems, central securities depositories, securities settlement systems, CCPs and trade repositories. Most jurisdictions, especially major markets including Hong Kong, are generally committed to adhere to recommendations prescribed by international standard setting bodies. In the OTC derivatives context, relevant authorities in overseas markets have indicated that they would require their local CCPs to meet the recommendations in the PFMI report.

Most of the principles are applicable to CCPs, in particular

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- The principles on *Credit and liquidity risk management*, namely credit risk management (Principle 4), collateral (Principle 5), margin (Principle 6), and liquidity risk management (Principle 7) form the core standards for financial risk management and financial resources.
- The principles of *Default management* are to ensure that a financial market infrastructure has appropriate policies and procedures to handle participant defaults. Principle 13 requires a financial market infrastructure to have effective and clearly

³ It should be noted that the OTC derivatives market is primarily a wholesale market.

defined rules and procedures to manage a participant default, and such rules and procedures should be designed to ensure that timely action can be taken to contain losses and liquidity pressures, such that the financial market infrastructure concerned can continue to meet its obligations. Principle 14 which applies specifically to CCPs requires the segregation and portability of customers' positions and related collateral in the event of default or insolvency of a participant.

(c) Types of products that are intended to be covered under the voluntary clearing regime

Asset classes to be cleared by the OTC CCP at the commencement of its business would be interest rate swaps (**IRS**) and non-deliverable forwards (**NDF**) that are liquid and standardised OTC derivatives products. In determining the product coverage, the OTC CCP's priority and emphasis are on the Hong Kong dollar (**HKD**) OTC derivatives market, the Offshore Renminbi (i.e. Renminbi deliverable in Hong Kong (**CNH**)) derivatives market as well as the Renminbi (**CNY**) non-deliverable markets as these products are systemically important to Hong Kong. These markets are crucial to Hong Kong as a financial centre since a significant portion of their trading volume is provided by local and mainland institutions.

Products	Currencies	Maximum Tenor
<u>IRS</u>		
Single Currency IRS	CNH, US Dollars (USD), Euros (EUR), HKD	10 years
Single Currency Basis Swap	USD, EUR	10 years
Overnight Index Swap	USD, EUR	10 years
Non-deliverable IRS (CNY 7-Day Repo)	CNY	5 years
<u>NDF</u>		
	USD/CNY, USD/Taiwan Dollar (TWD), USD/Korean Won (KRW), USD/Indian Rupee (INR)	2 years

(d) How the risks associated with OTC derivatives transactions can be reduced through the establishment of a local CCP for voluntary clearing

The clearing of OTC derivatives transactions through a CCP helps reduce risk within the market by putting a robustly-managed CCP between parties, in order to manage the closing out of transactions in the case of a market participant default and maintain stability in the market.

A CCP stands between two parties, acting as the counterparty to each side of the trade. This allows the CCP to perform multilateral netting, which could facilitate the reduction of counterparty risk.

With a robust risk management framework, a CCP could manage and mitigate risk effectively, for example, by requiring clearing members to post collateral as margin and to contribute to the guarantee fund. It could also contribute to a reduction of systemic risk, through mutualisation of losses across all clearing members in the event of the

failure of a clearing member. For further details of how the OTC CCP's risk management framework reduces risk, please see **Annex 2**.

With a more streamlined and automated trade process, clearing through a CCP could reduce operational risk. It could also further improve operational efficiency through more efficient collateral management and the standardisation of risk management.

The existence of the CCP has proved to help reduce risk in the event of Lehman's failure. In September 2008, LCH.Clearnet⁴ successfully managed Lehman Brothers' US\$9 trillion interest rate swap default without causing losses to other clearing members and the CCP. The default was resolved within the margin held by LCH.Clearnet.

(e) what are the risks associated with a local CCP for voluntary clearing and what risk management measures will be put in place by and for the local CCP under contemplation

The OTC CCP will implement robust risk management measures to ensure that the risks it bears can be prudently managed. The size of OTC derivatives transactions cleared through the OTC CCP will be subject to certain inherent limits as part of the OTC CCP's capital and margin requirements. Such risk management measures include -

- (i) Only highly liquid and standardised products will be acceptable for clearing. Subject to SFC approval, the OTC CCP will initially only provide clearing service for two types of plain vanilla products, i.e. IRS and NDF. Before any new product launch, the OTC CCP will go through a stringent decision-making process to check whether the product has sufficient liquidity and standardisation for central clearing, including approval by the board of the OTC CCP, its risk management committee and its product advisory committee. In particular, the OTC CCP's risk management committee and product advisory committee will have non-executive and clearing member representation. In addition, any new product launch will be subject to SFC approval, and when considering whether to clear a new product, the OTC

⁴ LCH.Clearnet is a CCP located in London. It is the largest CCP for interest rate swaps.

CCP as a RCH under the SFO will have to have regard to its statutory duties under section 38 of the SFO to ensure that risks associated with its business and operations are managed prudently, and act in the interest of the public.

- (ii) Market participants can only be admitted as a clearing member, and continue to remain as a clearing member, for so long as it complies with OTC CCP's strict prudential membership criteria. The OTC CCP's membership criteria will follow internationally accepted risk management and internal control practices, with the aim of safeguarding the OTC CCP to avoid exposure to excessive risk beyond its financial capability, and are expected to include the following requirements –
- Clearing members are expected to be authorized institutions under the Banking Ordinance (**Authorized Institutions**) or licensed corporations under the SFO (**Licensed Corporations**), or similarly regulated entities in acceptable overseas jurisdictions.
 - The minimum capital requirement for clearing members is \$10 billion in tier 1 capital for Authorized Institutions or \$10 billion in liquid capital for Licensed Corporations, or such higher capital level as may be required by the clearing member's regulator from time to time.
 - In addition to the minimum capital requirement above, a clearing member will need to maintain capital in proportion to its business size, to ensure it has the ability to meet its obligation to contribute to the guarantee fund and to meet replenishment calls (please see sub-paragraph (v) below). The OTC CCP will ensure each clearing member's current capital is prudential relative to stress losses, either by raising the capital requirement of a clearing member where appropriate or requiring additional margin to be posted. (Please refer to the "Additional Margin" section in **Annex 2**.)
- (iii) Each trade submitted by a clearing member will only be accepted for clearing if the trade details match the product eligibility requirements of OTC CCP, if credit limits are satisfied, and if the clearing member has posted sufficient collateral to cover OTC CCP's potential future losses on that trade in normal

circumstances if that clearing member defaults (**Initial Margin** or **IM**). The requirement to collateralise the trade prior to clearing is even more stringent than the on-exchange traded derivatives clearing systems.

- (iv) Once a trade is cleared, a clearing member also needs to post collateral every day to cover the daily change in marked-to-market value of the trade (**Variation Margin** or **VM**), to ensure that OTC CCP does not accumulate losses over time.
- (v) In addition to IM and VM, the OTC CCP will have a dynamic guarantee fund that is sized in accordance with the amount of risk that the OTC CCP is exposed to at the relevant time, which will comprise funds contributed by clearing members and by the OTC CCP to absorb any losses due to the default of clearing members. In the case of a shortfall in the guarantee fund, the OTC CCP may make replenishment calls to clearing members to demand additional contribution to the guarantee fund. The amount of guarantee fund required will be risk-based and sized using modeling and stress testing methods in accordance with international standards.
- (vi) The OTC CCP's management of a clearing member default will be done in accordance with procedures designed with the support of clearing members and external consultant with the relevant expertise and experience, and will be similar to those successfully used by other CCPs before, for example during the Lehman Brothers default.

Please see Item 3 and **Annex 2** for further details.

(f) Role and possible liability of the HKSAR Government under the voluntary clearing regime

As mentioned in (b) above, the SFC may, after consultation with the Financial Secretary, recognise a local CCP as an RCH under section 37(1) of the SFO.

A clearing member who chooses to clear the OTC transactions through the OTC CCP under the proposed voluntary clearing arrangement may claim against the OTC CCP under the contract between the clearing member and the OTC CCP in respect of the OTC derivatives transaction clearing. The Government is not a party to the contract.

The OTC CCP is established as a wholly owned subsidiary of HKEx that is dedicated to OTC derivatives clearing. The OTC CCP will operate independently of HKEx's existing clearing houses. As such all risks and liabilities relating to OTC derivatives clearing will be confined to the OTC CCP subsidiary level.

In the extreme event that the OTC CCP's financial resources are not enough to absorb losses incurred by the OTC CCP due to one or more clearing members' default, then the OTC CCP will wind down all positions with a final mark to market settlement cycle. Following payments determined in such final settlement cycle, there will be no further amounts owed to the clearing members, and there will be no impact to HKEx or its other on-exchange clearing houses. Please see the section "Limited Recourse and Capped Losses" in **Annex 2** for further details.

(g) Estimated volume of OTC derivatives transactions and the percentage of such volume out of the global transaction volume of OTC derivatives

According to the survey data of 2009, the volume of OTC derivatives transactions in Hong Kong was estimated to be USD 16,620.79 billion (by gross notional amount). It was estimated that the OTC derivatives transactions in Hong Kong accounted for less than 1% of the global OTC derivatives market share.

(h) Benefits of the establishment of a local CCP for voluntary clearing

There are significant benefits in having a local CCP, as noted by the Bank of International Settlements (**BIS**) in its paper -

"The establishment of domestic CCPs for some types of OTC derivatives may become an important part of the global infrastructure for clearing standardised contracts. A domestic CCP could strengthen the ability of local authorities to exercise oversight and regulation of derivatives trading activity in their own jurisdictions, as well as to perform crisis management and resolution if needed. Domestic CCPs are more likely to have significant benefits

*in markets where local participants are prominent or where there are special market needs."*⁵

Operational advantages: Clearing through a local CCP regulated by the SFC will have a number of operational advantages for market participants in Hong Kong, as compared to clearing through overseas CCPs. It could facilitate communication since the CCP operates in the same time zone, and enable collateral to be held locally and thus be more readily accessible. In the event of default, the SFC could more effectively assist local participants and monitor any potential systemic implications for the local market.

Stability of financial system in Hong Kong: A CCP is a necessary market infrastructure to improve the resilience of the OTC derivatives market. The establishment of this critical market infrastructure in Hong Kong would help maintain the stability of our financial system as well as strengthen our status as an international financial centre.

Notwithstanding that mandatory clearing obligations have yet to be finalised in different markets, international trends and experience show that market participants are already moving towards clearing their OTC derivatives transactions through a regulated CCP on a voluntary basis. This is the case in the United States, Europe and Singapore. Market participants recognise that the earlier they start central clearing, the more prepared they will be when the mandatory clearing obligation is implemented. They also recognise that centrally clearing their OTC derivatives transactions helps mitigate risks and brings benefits and protection for both themselves and the market as a whole.

From the CCP's perspective, the ability to offer voluntary clearing prior to the mandatory clearing obligations coming into effect will also provide the CCP with a phase-in period to work closely with market participants for the purpose of ensuring the smooth functioning of the CCP in preparation for the final implementation of mandatory clearing.

Clearing niche market products: The establishment of a local CCP could support the clearing of niche market products unique to the local/regional market, for which

⁵ See Executive Summary of the CGFS Papers No. 46 : *The macrofinancial implications of alternative configurations for access to central counterparties in OTC derivatives markets* dated November 2011 (**BIS Paper**).

most of the global CCPs are not covering at this stage. This could not only cater for the local/regional market need, but also attract overseas financial institutions that are interested in participating in the local/regional OTC derivatives market to become members of the local CCP. In addition, a local CCP would be better able to manage risks specific to the local market or risks relating to local players.

Enhancing Hong Kong's role as an offshore Renminbi centre and to facilitate clearing of Renminbi-denominated transactions: Given that convertibility is still a constraint, establishing an infrastructure locally in Hong Kong would benefit both market participants and the development of the Hong Kong market. Major overseas banks may find it attractive to set up presence in Hong Kong for trading in Renminbi-denominated transactions in future. A local CCP would be an important part of our infrastructure to maintain maximum readiness to capture potential business opportunities arising from further Renminbi liberalisation and facilitate our role as an offshore Renminbi centre.

As some CCPs in other jurisdictions are already providing central clearing for HKD and Renminbi OTC derivatives products, allowing voluntary clearing of these products in Hong Kong will enable Hong Kong to compete with overseas markets and strengthen Hong Kong's position as an offshore Renminbi centre.

Maintaining Hong Kong's competitiveness as a financial centre: In view of the tremendous growth of Renminbi activities, there is an increasing need for appropriate infrastructure to facilitate intermediation and to cope with risk management, in particular, in the OTC derivatives market. Major financial centres, such as Singapore and London, are striving to capture the potential business growth in this area, including revising legislation and developing infrastructure. It is critical for regulators in Hong Kong to take prompt action and necessary steps to facilitate the development of relevant regulatory framework and infrastructure to meet with the challenge and maintain our financial competitiveness, so that we will not lose our competitive edge and business potential in the absence of a local CCP.

Access by local participants: Asian markets are often characterised by the presence of a number of relatively

smaller, local players, such as the local banks who act as intermediaries, where OTC derivatives activities, in particular interest rate swaps and foreign-exchange derivatives, are part of their integrated banking business. The development of a local CCP may enable access by such players which may not be able to satisfy the membership criteria of global CCPs. It may also enable the local market participants to have easier access to their collateral. It should be noted that members of the local CCP will nevertheless be subject to stringent access criteria and risk management of the local CCP which will be required to be on a par with international standards.

(i) Consequences of not establishing a local CCP for voluntary clearing

If the voluntary clearing regime in Hong Kong is not established and a local CCP cannot be set up in Hong Kong under the RCH regime, then market participants who want to clear their OTC derivative transactions will only be able to do so through overseas CCPs. Relying only on overseas CCPs will lose the advantages of having a local CCP as mentioned in Item 1(h) above.

2. Information in respect of the mandatory clearing obligation to be imposed on market participants in the proposed regulatory framework for the OTC derivative market

(a) Whether it is mandatory for Hong Kong to follow the "G20 requirements" and pursue mandatory clearing of OTC derivatives through CCPs

The G20 requires consistent implementation of mandatory clearing, trading and reporting requirements on standardised OTC derivatives, and imposition of higher capital and margin requirements in respect of OTC derivatives transactions that are not centrally cleared. The objectives are to improve market transparency, mitigate systemic risk and prevent market abuse. The G20 has authorised the FSB to monitor the progress of members in implementing the reforms on regulatory measures. As a member of the G20 and the FSB, Hong Kong has the responsibility to comply with the guidelines set by them so as to achieve the goal of financial stability. These measures are also critical to strengthening Hong Kong's position as an international financial centre.

- (b) **If the answer to (a) above is affirmative, what are the risks (if any) that may be faced by the financial system of Hong Kong and whether Hong Kong can stand such risks**

As stated in Item 1(d) above, the reform measures on the OTC derivatives market including mandatory clearing will help improve market transparency, mitigate systemic risk and prevent market abuse. Implementation of such reform measures will enable Hong Kong to better manage the risks relating to the OTC derivatives market.

- (c) **What will be the loss to or impact on Hong Kong, should Hong Kong choose not to follow the said "G20 requirements" and/or not providing a local CCP**

Given the global and cross-border nature of OTC derivatives markets, if the G20 requirements are not to be followed, such OTC derivatives transactions may turn to unregulated markets due to tightening of regulations in other markets, thus incurring a risk of regulatory arbitrage. As a member of the G20 and the FSB, Hong Kong has the responsibility to comply with the guidelines set by them so as to achieve the goal of financial stability.

Without a local CCP, OTC derivatives players in Hong Kong will have no option but to clear through overseas CCPs via certain global dealers. This may lead to over-concentration of risks on a few global institutions and weaken the intermediary function of local financial institutions.

At the same time, the development of a local CCP is conducive to the financial intermediation and risk mitigation of certain financial instruments with regional characteristics, such as Renminbi-denominated OTC derivatives. The establishment of a local CCP can also attract more overseas financial institutions to participate in the local OTC derivatives market so as to enhance Hong Kong's strength as an international financial centre.

3. **To consider imposing a cap (say, on a daily basis or otherwise) on the transaction volume of OTC derivatives to be handled under the proposed voluntary clearing regime and/or specifying a cap on the face value of each OTC**

derivative transaction that is to be regarded as a futures contract that may be cleared through a local CCP

The size of OTC derivatives transactions cleared through the OTC CCP will be subject to certain inherent limits as part of the OTC CCP's capital and margin requirements in the proposed risk management framework. For example -

- (i) A clearing member must have posted sufficient collateral to cover the Initial Margin and Variation Margin of its cleared transactions plus the Initial Margin of any new trade submitted for clearing, before such new trade is accepted for clearing by the OTC CCP. If a clearing member does not deliver sufficient collateral to satisfy such margin requirement, it will not be able to submit the new transaction for clearing and the OTC CCP's exposure to such clearing member will be limited to such clearing member's existing portfolio of cleared transactions
- (ii) The OTC CCP has the right to impose additional concentration margins on clearing members with portfolios where five days of margin coverage is not sufficient due to portfolio concentration risk in one or more positions. Again, if a clearing member does not deliver collateral to satisfy such additional concentration margin, it will not be able to submit new transactions for clearing and the OTC CCP's exposure to such clearing member will be limited to such clearing member's existing portfolio of cleared transactions.
- (iii) In addition to the minimum \$10 billion capital requirement that the OTC CCP imposes on all clearing members as set out in our response to item 1(e) above, the OTC CCP may impose additional capital requirements based on relative risk. This effectively means that, unless the relevant clearing member increases its capital level, the total size of the OTC CCP's trade exposure to that clearing member will be capped.
- (iv) The limits set by the OTC CCP in relation to the margin and capital requirements above are proportionate to the level of risk relating to the relevant clearing member and/or its transactions, which is determined by the OTC CCP based on daily stress testing modeled on worst case scenarios to ensure that the OTC CCP has sufficient financial resources to withstand losses from the cleared transactions even in extreme but plausible situations. Please refer to **Annex 2** for further details.

In addition, the SFC has the power to impose position limits pursuant to section 35 of the SFO. The OTC CCP will also, as part of its risk management framework, have powers to impose position limits on its clearing members under its proposed clearing rules. We believe this is a more practical and effective way to introduce limit on clearing members as and when the situation warrants such action, rather than imposing a limit on total daily turnover or notional amount per transaction. The latter will create practical difficulties for the OTC CCP and other jurisdictions such as the United States, European Union and Japan currently do not impose similar limits on the clearing of OTC derivatives transactions. If position limits are set on the number of transactions that can be cleared, then any transactions exceeding such limits will have to remain as bilateral OTC derivative transactions between market participants, with the risk that the insolvency of one or more market participants (such as Lehman Brothers) involved in the web of bilateral OTC derivative transactions could trigger a disorderly unwind process affecting multiple market participants and cause market dislocations throughout the financial system.

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Overview of principles and responsibilities

Principles for financial market infrastructures

General organisation

Principle 1: Legal basis

An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.

Principle 2: Governance

An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.

Principle 3: Framework for the comprehensive management of risks

An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.

Credit and liquidity risk management

Principle 4: Credit risk

An FMI should effectively measure, monitor, and manage its credit exposures to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions.

Principle 5: Collateral

An FMI that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.

Principle 6: Margin

A CCP should cover its credit exposures to its participants for all products through an effective margin system that is risk-based and regularly reviewed.

Principle 7: Liquidity risk

An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of

confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions.

Settlement

Principle 8: Settlement finality

An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.

Principle 9: Money settlements

An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.

Principle 10: Physical deliveries

An FMI should clearly state its obligations with respect to the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries.

Central securities depositories and exchange-of-value settlement systems

Principle 11: Central securities depositories

A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues and minimise and manage the risks associated with the safekeeping and transfer of securities. A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry.

Principle 12: Exchange-of-value settlement systems

If an FMI settles transactions that involve the settlement of two linked obligations (for example, securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.

Default management

Principle 13: Participant-default rules and procedures

An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.

Principle 14: Segregation and portability

A CCP should have rules and procedures that enable the segregation and portability of positions of a participant's customers and the collateral provided to the CCP with respect to those positions.

General business and operational risk management

Principle 15: General business risk

An FMI should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.

Principle 16: Custody and investment risks

An FMI should safeguard its own and its participants' assets and minimise the risk of loss on and delay in access to these assets. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.

Principle 17: Operational risk

An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.

Access

Principle 18: Access and participation requirements

An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.

Principle 19: Tiered participation arrangements

An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.

Principle 20: FMI links

An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.

Efficiency

Principle 21: Efficiency and effectiveness

An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.

Principle 22: Communication procedures and standards

An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.

Transparency

Principle 23: Disclosure of rules, key procedures, and market data

An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.

Principle 24: Disclosure of market data by trade repositories

A TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs.

Responsibilities of central banks, market regulators, and other relevant authorities for financial market infrastructures

Responsibility A: Regulation, supervision, and oversight of FMIs

FMIs should be subject to appropriate and effective regulation, supervision, and oversight by a central bank, market regulator, or other relevant authority.

Responsibility B: Regulatory, supervisory, and oversight powers and resources

Central banks, market regulators, and other relevant authorities should have the powers and resources to carry out effectively their responsibilities in regulating, supervising, and overseeing FMIs.

Responsibility C: Disclosure of policies with respect to FMIs

Central banks, market regulators, and other relevant authorities should clearly define and disclose their regulatory, supervisory, and oversight policies with respect to FMIs.

Responsibility D: Application of the principles for FMIs

Central banks, market regulators, and other relevant authorities should adopt the CPSS-IOSCO *Principles for financial market infrastructures* and apply them consistently.

Responsibility E: Cooperation with other authorities

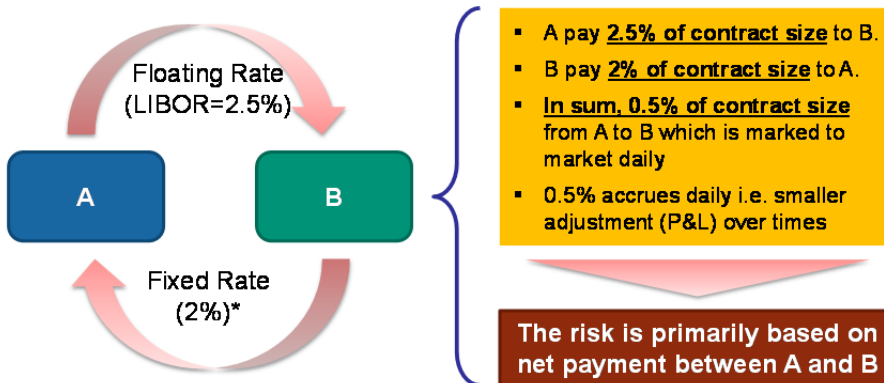
Central banks, market regulators, and other relevant authorities should cooperate with each other, both domestically and internationally, as appropriate, in promoting the safety and efficiency of FMIs.

RISK MANAGEMENT APPENDIX

Market Risk

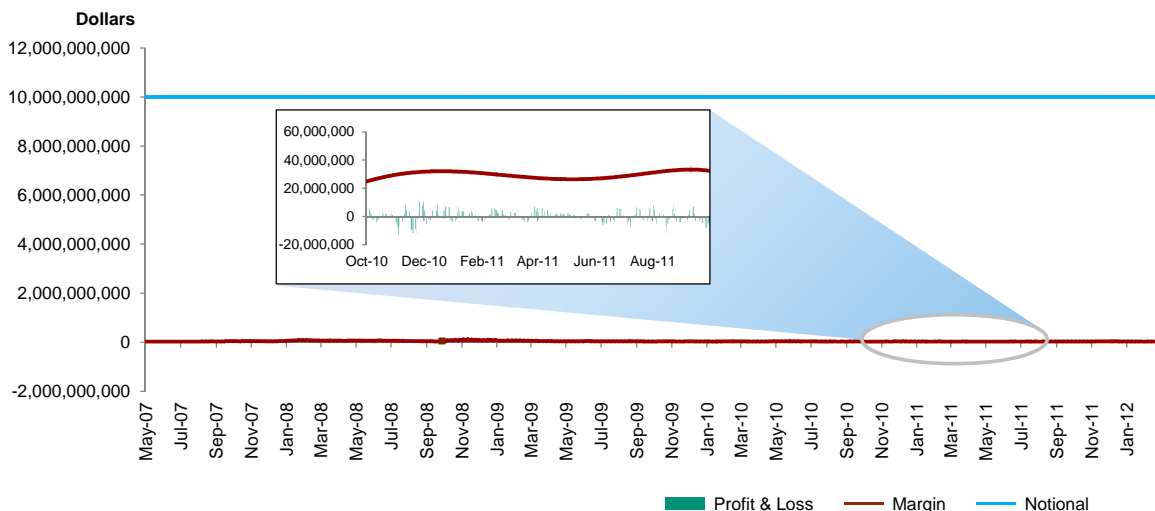
The market risk of an OTC derivative transaction is measured by the Profit and Loss (P&L) and Initial Margin (IM). The notional size of a transaction is not a good indication of the risk.

- In an IRS transaction, A's gain is B's loss (or vice versa).



* For illustration

- The net risk of an OTC derivatives transaction, such as an IRS contract, is relatively small despite its large notional value.
- Below is an example showing the relationship between the notional value and the risk exposure (the IM and P&L) for an IRS transaction with a notional value of \$10 billion and a maturity of 1 year. In the example, the IM required to cover risk at a single-tailed confidence level of 99% or more is on average, approximately about \$40 million, or 0.4% of the notional value.

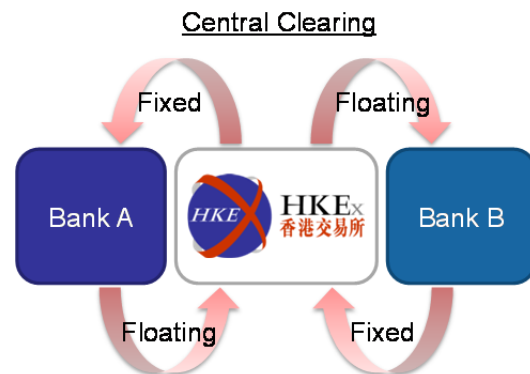


* IM is 0.4% of Notional on average

** This is for illustration purpose only and this will be subject to final calibration for margin

Counterparty Risk Assumed by OTC CCP

The OTC CCP will stand between two clearing members and assume the legal counterparty risk for the trade it clears. However, the risks to which the OTC CCP is exposed are mitigated through an effective risk management system which comprises tight clearing membership criteria, a well-tested margin and guarantee fund model, and robust default management process. The membership criteria are set out in our response to question 1(e) above, while further details on the margin and guarantee fund model, and the OTC CCP's default management process, are set out in the section below.



Risk Management Measures

The OTC CCP's margin model and processes are built on well-proven approaches used by other major CCPs and in compliance with CPSS-IOSCO principles and standards.

Types of Margin

Initial Margin (IM)

The OTC CCP requires clearing members to post IM to cover OTC CCP's potential future losses on that trade in normal circumstances if that clearing member defaults. IM will be calculated using a value-at-risk based model, with a single-tailed confidence level of 99% or more with respect to a 5 day close-out period, based on the pricing inputs, valuation and settlement curves.

Variation Margin (VM)

A clearing member needs to post VM every day to cover the daily change in P&L (or mark-to-market ("MTM") value) of its cleared trades, to ensure that OTC CCP does not accumulate losses over time. MTM is the act of recording the price or value of the portfolio to reflect its current market value rather than its book value. VM will be calculated based on the pricing inputs, valuation and settlement curves.

Valuation and Settlement Curve

MTM of positions will be recalculated with latest market price every 30 minutes during business hours. End of Day ("EOD") settlement curves will be published daily. Pricing inputs for settlement curve will be obtained from solid data feeds (broker quotes and reliable market data sources) throughout the day. Inputs for valuing IRS will include London InterBank Offered Rate (LIBOR) rates, Forward Rate Agreements (FRA) (short term) and Swap Rates (Long term). Inputs for valuing NDF will include spot foreign exchange rates, and forward rates/points in different tenors. Clearing members can acquire all information regarding pricing inputs, daily settlement curves and MTM result via the OTC CCP's web portal.

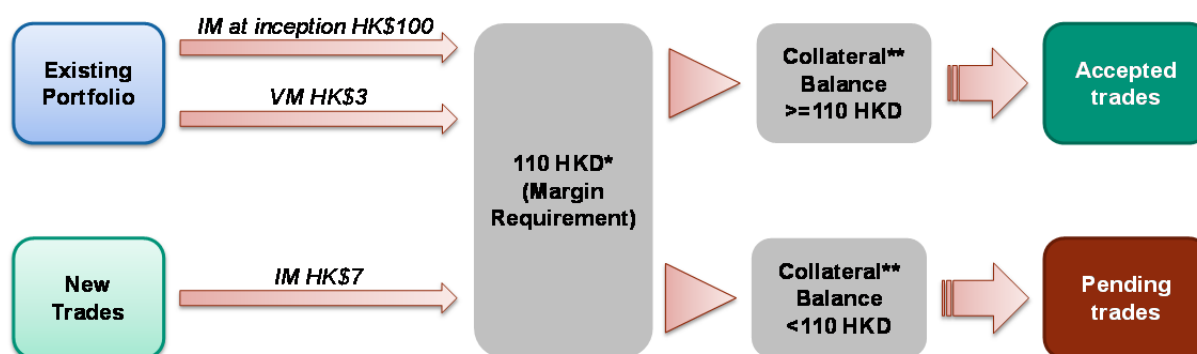
Additional Margin

In addition, the OTC CCP will have the ability to require clearing members to post additional margin if a clearing member's trade exposure exceeds set thresholds in a particular currency, curve, underlying rate or in respect of the aggregate portfolio risk, or if a clearing member's guarantee fund contribution is greater than 20% of its capital.

New Trade Margin Check

Margin Check and Credit Check (Pre-collateralized risk exposures)

The OTC CCP will calculate IM for each trade when it is submitted for clearing. OTC CCP will check if existing collateral deposited with the clearing house by the two clearing members are sufficient to cover the new margin requirements and if the relevant risk limits (a form of cap on OTC CCP's risk exposure to each clearing member) are satisfied. If collateral is sufficient, the trades will be novated to OTC CCP. Trades without sufficient collateral will be put on pending status and a margin call will be issued. Risk exposure will be collateralized before a trade is accepted for clearing by OTC CCP.



* $Margin\ Requirement = IM + VM$ (Intra-day Collateralized)

** $Collateral\ Balance = Collateral\ held$

$Collateral\ excess/deficit = Margin\ Requirement - Collateral\ Balance$

Novation Process

Through the novation process, OTC CCP will interpose itself between the two original counterparties to become a counterparty to each side of the trade. There will be two types of novation:

- Real time novation - New trades will be novated on a trade-by-trade basis when transmitted from the trade confirmation platforms to the OTC CCP;
- Portfolio novation - The OTC CCP will run several periodic novation cycles on each business day to clear all new trades that are in pending status.

OTC CCP will perform margin and credit checks during each novation process (both real time and portfolio novation) to ensure that the relevant clearing member has sufficient collateral to cover the risk it brings to the OTC CCP.

Overnight Pending Trades

In addition to the risk pre-collateralization, OTC CCP will have a margin call every morning.

Margin Call and Margin Reporting

Intra-day Margin Call

OTC CCP will make an intra-day VM call twice each day (i.e. one in the morning and one in the afternoon), and has the authority to make ad hoc additional margin calls if needed. A clearing member will have to pay intra-day VM if the intraday exposure exceeds its credit limit exposure. Payment must be made to the OTC CCP within 1 hour of any ad hoc margin call.

EOD Settlement Process

The EOD settlement process will capture the incremental risk exposure of each clearing member in every business day. The process will involve calculation of IM and VM. The calculation will take into consideration the MTM change of portfolios, volatility movements, and margin add-on for risk multipliers. Clearing members can retrieve the detailed margin reports through OTC CCP's web portal.

Collateral

In terms of collateral, only highly liquid assets, such as cash and exchange fund notes, will be accepted by OTC CCP as margins and guarantee fund contribution. Collateral will be subject to such haircut as the OTC Risk Management Committee may deem appropriate.

OTC CCP may, after consulting with market participants, include other liquid financial instruments, such as high quality sovereign bonds and exchange-traded funds, in the eligible collateral list in the future.

Collateral will be marked to market each day. A clearing member will be required to pose additional collateral if the value of the collateral decreases due to changes in market prices or changes in the collateral haircut by the OTC CCP.

Model Testing

Back Testing

Back testing will include, but not be limited to, the following data:

- In sample data such as Hong Kong Interbank Offered Rate (HIBOR) and LIBOR ;
- In sample currencies and rates (such as RMB, KRW, TWD and INR) and out of sample currencies and rates such as Thai Bhat (THB), Argentine Peso (ARS) and Brazilian Real (BRL)

And extreme events:

- Going back up to 30 years

Stress Testing

OTC CCP will perform stress tests on clearing member's portfolios regularly using a margin model that will be calibrated to cover extreme, but plausible historic market moves and synthetic scenarios.

OTC CCP will carry out thorough stress tests for margin and guarantee fund requirements. Key attributes for stress testing will include:

- Margin coverage testing for 1 and 5 days for cleared portfolio
- Reverse stress testing to identify other extreme non-plausible scenarios
- IM to include stress events based on historic data
- Worst case (stress) events such as:
 - 1987 Stock Crash
 - 1998 Asian Financial Crisis
 - 2003 SARS
 - 2008 Global Financial Crisis (including Lehman Default)
 - Theoretical scenarios
 - Currency Devaluation
- Ensure the OTC CCP will have adequate financial resources to cover default losses
- Assess clearing member's capital level

Default Management Process

OTC CCP's default management process is designed to properly manage a default clearing member's portfolio of transactions cleared with the OTC CCP without affecting the non-defaulting clearing member's trades. The default management process will be tested at least annually with the participant of clearing members.

In a clearing member default situation, OTC CCP will auction the defaulting clearing member's portfolio in a timely and orderly manner to reduce and neutralize the overall risk exposure (and cost) to OTC CCP. The default management process will take into account international standards such as the CPSS-IOSCO Report and similar procedures successfully used by other overseas CCPs before, for example during the Lehman's default in 2008.

Guarantee Fund and Financial Resources

Guarantee Fund

OTC CCP's guarantee fund will be an effective risk measure to mitigate default risks (losses). The guarantee fund will be made up of contributions from clearing members and OTC CCP. It will consist of two parts, i.e., the pre-funded portion and the unfunded portion. The pre-fund portion will be sized to cover the largest uncollateralized (i.e., exposure not backed by collateral) loss while the unfunded portion will cover an amount equal to 2 times of the pre-funded portion.

Each clearing member will be required to contribute to the guarantee fund based on its risk profile. OTC CCP will re-size the guarantee fund at least once a month. This will keep OTC CCP's risk current and ensure that the guarantee fund will reflect the most updated risk profile of clearing members.

The guarantee fund will be stress-tested regularly to ensure the pre-funded portion will be sufficient to cover the default of the single largest clearing member. The unfunded portion will be called by the OTC CCP, if required, to cover additional and potential default exposures.

'Defaulter Pays' model

The OTC CCP will adopt a 'defaulter pays' model. In the event of a clearing member default, the OTC CCP will first utilize the defaulting clearing member's margin and guarantee fund contribution to cover losses incurred by the OTC CCP as a result of such clearing member's default.

OTC CCP Capital Reserves

OTC CCP will have capital reserves specifically designated to cover clearing member default losses. There will be two tranches of reserves. The funds in the first tranche will be available for use after the defaulter's margin and the defaulter's pre-funded guarantee fund contribution are exhausted. The second tranche of the reserves will be used to cover losses exceeding other non-defaulting members' pre-funded contribution to the guarantee fund.

Non-defaulting Members' Guarantee Fund Contribution

Non-defaulting members' guarantee fund will be used to mitigate the default loss when the first tranche of OTC CCP's capital reserves is depleted. The loss will be shared proportionately among non-defaulting clearing members.

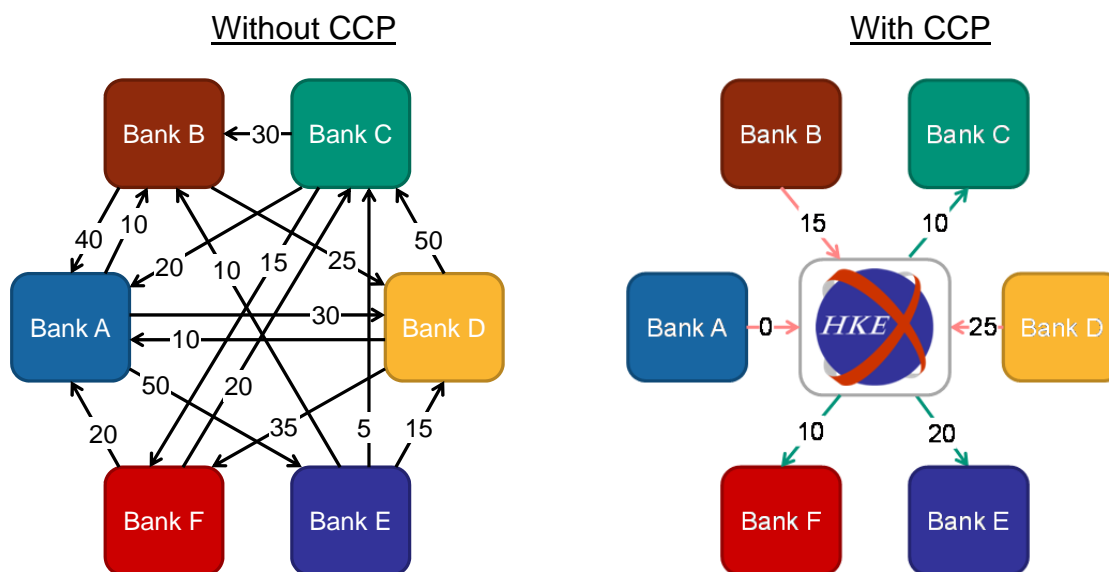
Limited Recourse and Capped Losses

If a default loss exceeds all the available funds in the OTC CCP's financial resources, all the cleared positions in the clearing house will be wound down through a limited recourse process. OTC CCP will then reduce the gains pro-rata based on the

deficiency of unpaid losses. Following payment of such gains or losses, there will be no further amounts owed to the clearing members, and there will be no impact to HKEx or its other on-exchange clearing houses.

Netting Benefit vs. Systemic Risk

The following diagrams illustrate how a CCP reduces the systemic risk by netting offsetting transactions between multiple counterparties.



Without CCP and netting, the default of one bank could cause a catastrophic shock to the whole market. In the “Without CCP” diagram above, if for example bank A defaults, its counterparties B, C, D, E and F will each need to terminate and close-out their transactions with bank A, and find replacement transactions to hedge their positions. The default of bank A may cause severe dislocations in the markets and affect the termination prices that bank A’s counterparties may be able to obtain in the market to value their transactions. Bank A’s counterparties may suffer substantial losses as a result of the early termination of their transactions with bank A, and this could in turn affect such counterparties’ ability, or perceived ability, to fulfill their payment obligations to other banks. The same analysis applies in the case of a default of any other bank B, C, D, E or F in the above diagram.

With a CCP interposed between the market participants to act as counterparty to each transaction, the impact of a default brought by a bank will be minimized through netting, margin and the availability of the CCP’s guarantee fund, and the CCP’s default management process. In the diagram “With CCP” above, each bank only faces the CCP and its exposure to the CCP is netted to a single exposure. In the event of a default by one of the banks, for example bank B, the CCP will be able to terminate the transactions with bank B, and find replacement transactions to hedge itself quickly using auctions under its default management process. Any losses incurred by the CCP can be absorbed by the Initial Margin and Variation Margin

posted by bank B before its default to collateralize its transactions. Under the extreme but plausible scenarios where the Initial Margin and Variation Margin posted by bank B are insufficient to cover all losses of the CCP, CCP will be able to absorb such losses using the guarantee fund contributions first from the defaulting members, and then from the CCP and the non-defaulting members. Finally, the CCP can call for the unfunded portion of the guarantee fund from non-defaulting members to cover any further losses. In the meantime, the transactions between CCP and banks A, C, D, E and F will continue and will not be terminated due to bank B's default. Banks A, C, D, E and F will be able to calculate their potential losses (through utilization of their share of the guarantee fund contribution), since such contribution requirement would be capped for a specified period. This is in contrast to the situation in the "Without CCP" example, where the counterparties' losses due to the default of bank A will depend on market prices at the relevant time, and may be exacerbated by market dislocations at the time of the default.