

CCP resilience and clearing membership

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3rd – 4th December 2015

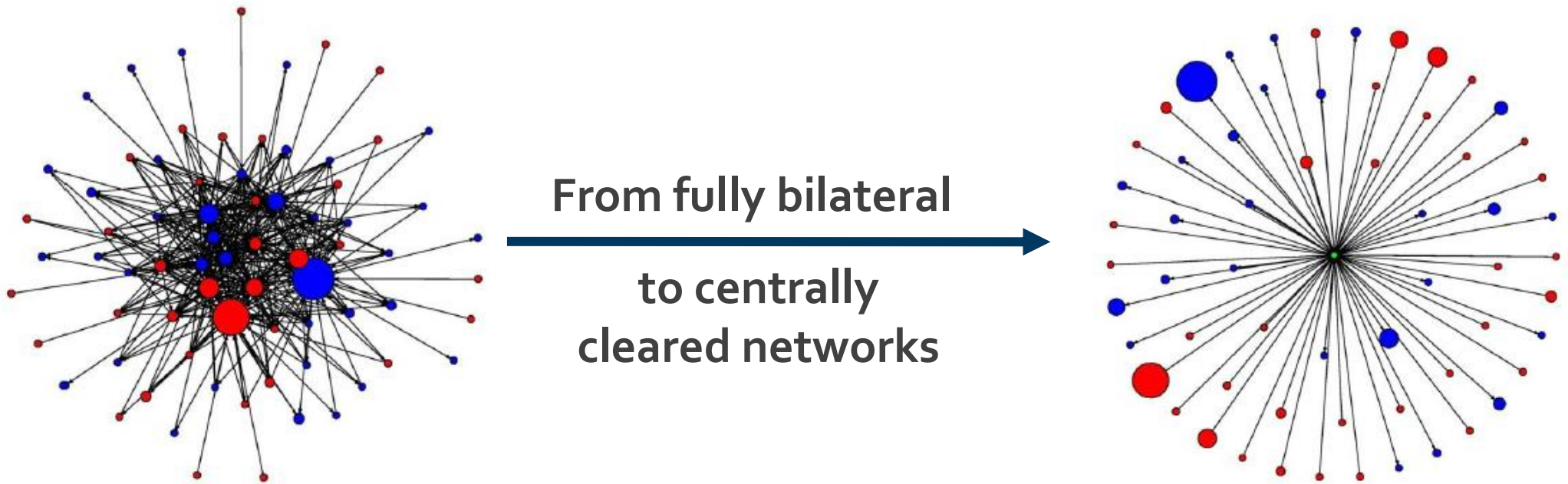
Financial Stability: Policy Analysis and Data Needs

Outline

1. CCP systemic risk: a major concern for financial stability?
2. CCP: a system to reallocate losses among clearing members
 - a) Mutualisation according to CCP rule books (default waterfall)
 - b) Recovery versus resolution (extra burden to clearing members?)
3. Creditworthiness of clearing members for EU and US CCPs
 - a) Ability to face liquidity calls under normal and stressed scenarios
 - b) Diverging CCP member bases: What happens when member base quality erodes?
4. Enhancing CCP resilience
 - a) membership eligibility, waterfall design, resolution regimes...

CCPs and systemic risk: a major concern for financial stability?

- “Mandatory clearing will turn CCPs into **systemic nodes** in the financial system, with **unknown**, but possibly far-reaching, **consequences**.” (ESRB, 2013)



- From “Interconnectedness and Systemic Risk: Lessons from the Financial Crisis and Policy Implications”, Remarks by Janet L. Yellen, American Economic / American Finance Association Luncheon <http://www.federalreserve.gov/newsevents/speech/yellen20130104a.htm>

CCPs and systemic risk as seen by European regulators

- “...the uncertainty caused by the default of a clearing member at KRX ... which caused it to tap its mutualised default fund...revealed that clearing members were not always aware of their potential liabilities towards the CCP...” (Cœuré, 2015)
- “A proper macroprudential stress test...should...account for the interconnectedness via common exposures to clearing members as well as possible knock-on effects on the banking sector that could arise in case the guarantee fund of a CCP is wiped out and clearing members are required to cover the CCP losses.” (Constâncio, 2015)



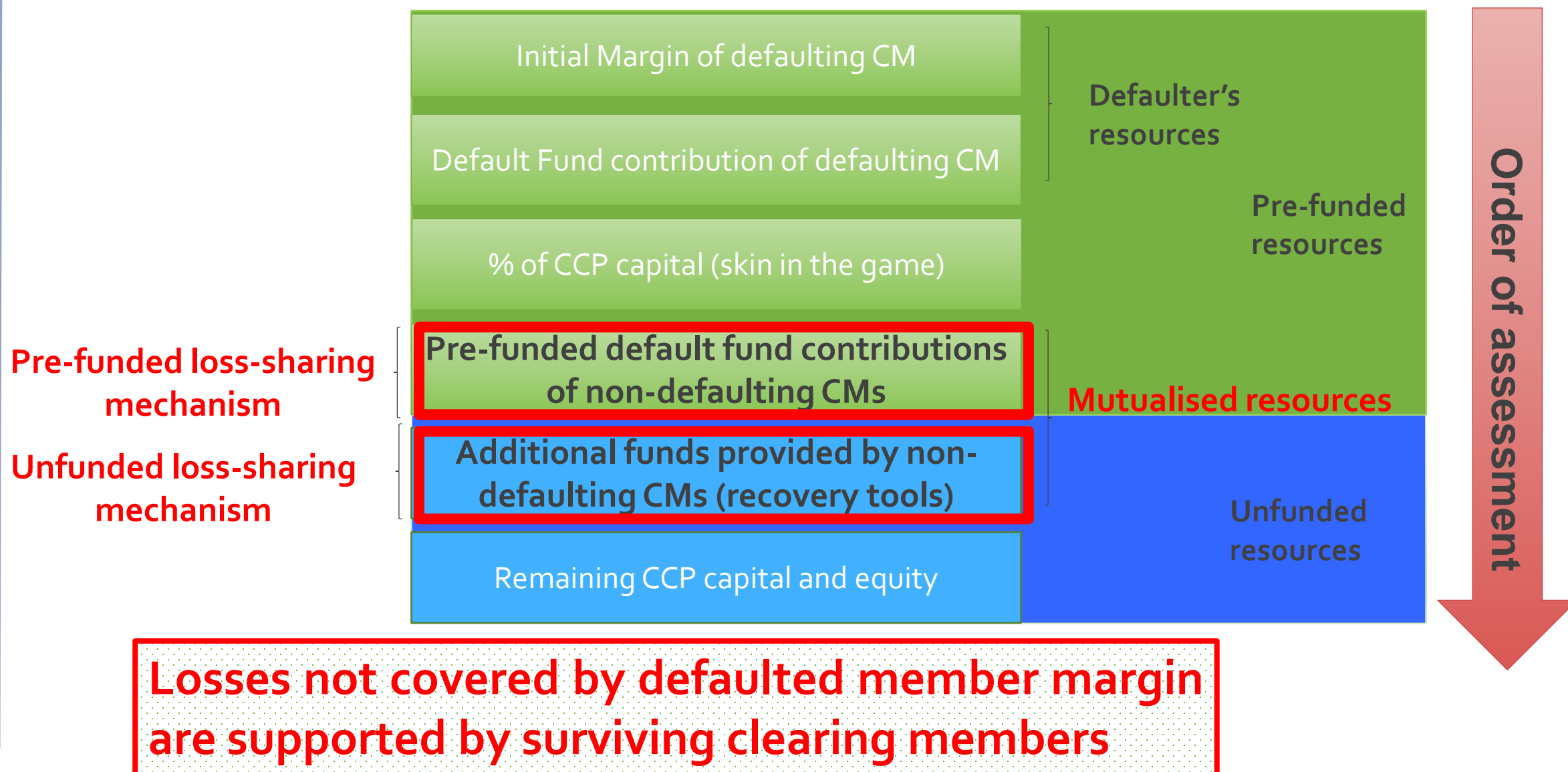
CCPs and systemic risk as seen by US regulators

- “CCP recovery strategy...is premised on imposing losses on...CCP members...will likely be suffering losses and facing liquidity demands of their own...uncertainty is increased by the difficulty of estimating with any precision the extent of potential liability of...complicating...efforts by the official sector to assess system-wide capital and liquidity availability...” (Tarullo, 2015)
- “... since the default of two large counterparties would almost surely be accompanied by significant market disruption...it is important to ensure a consistent, robust implementation of the cover 2 standard...” (Tarullo, 2015)

Board of Governors of the Federal Reserve System



CCP and clearing members: loss allocation rules



Resources mutualised among clearing members

- **Default fund contributions**

- Basel III capital charge for default fund exposures (2012): not risk sensitive

- **Recovery tools may lead to increased mutualisation**

- Replenishment of the default fund
 - **Surviving members are compelled to replenish the depleted DF**
 - To ensure continuity of CCP (instead of resolution)
 - **Creating extra exposures to good quality participants not assessed under current regulations**
 - Margin haircutting
 - Variation margin haircutting caps the post-default profits of CMs
 - Initial margin haircutting dramatically increases CMs counterparty risk
 - CCPs may face contemporary under-collateralisation

Rules for CCP resolution magnify clearing membership issues

- **International rules for recovery and resolution are in the making**
 - FSB (2011, 2014); European Commission (2012); CPSS-IOSCO (2013, 2014)
 - UK already set its own rules.
- **Being in good company is a key aspect of monitoring exposures to CCPs, as...**
 - FSB (2014) and CPSS-IOSCO (2014) favour continuity (recovery) over resolution...
 - **Bail-ins are to be privileged** and CCP capital amounts are quite low....
 - Only surviving participants' resources will be available
 - Need to consider surviving participants ability to raise funds in times of crisis
 - **Depends on financial strength of member base**
 - **Should the CMs ability to provide liquidity and their credit quality be monitored?**

Liquidity provision – a matter of monitoring?

- **What the guidelines state on monitoring the members' ability to provide liquidity....**
 - *“An FMI should have a robust framework to manage its liquidity risks from the full range of participants and other entities.” (PFMI, 2012)*
 - *“...an FMI should take into account the extent to which participants, owners and third parties would have sufficient resources to meet their obligations when considering the reliability of a tool or a set of tools.” (CPSS-IOSCO, 2014)*

Credit exposures and credit quality – a matter of monitoring?

- **What the guidelines state on monitoring credit exposures....**
 - *“An FMI should effectively measure, monitor, and manage its credit exposures to participants ...”* (PFMI, 2012)
- **What is the perspective of CCPs?**
 - *“We could be adversely impacted by the financial distress or failure of one or more of our clearing firms...”* (CME Group INC., 2014)
 - Credit quality of clearing members is a business related risk factor (Intercontinental Exchange, 2014)

Empirical analysis of member bases across EU and US CCPs

- **Topical issue**

- Resolution regimes will enable authorities to call upon members, participants, investors and clients (EC, 2015)
- Ability of CCPs to face default of two CMs (**cover 2 standard**)? (Murphy and Nahai-Williamson, 2014)

- **Risk distribution of member bases: assessment of CCP resilience**

- 13 major CCPs operating in the EU and the US
- Normal market conditions
- Stressed scenario with two defaulted participants

- **Member base typology**

- Average credit quality (high/low), heterogeneity (high/low)

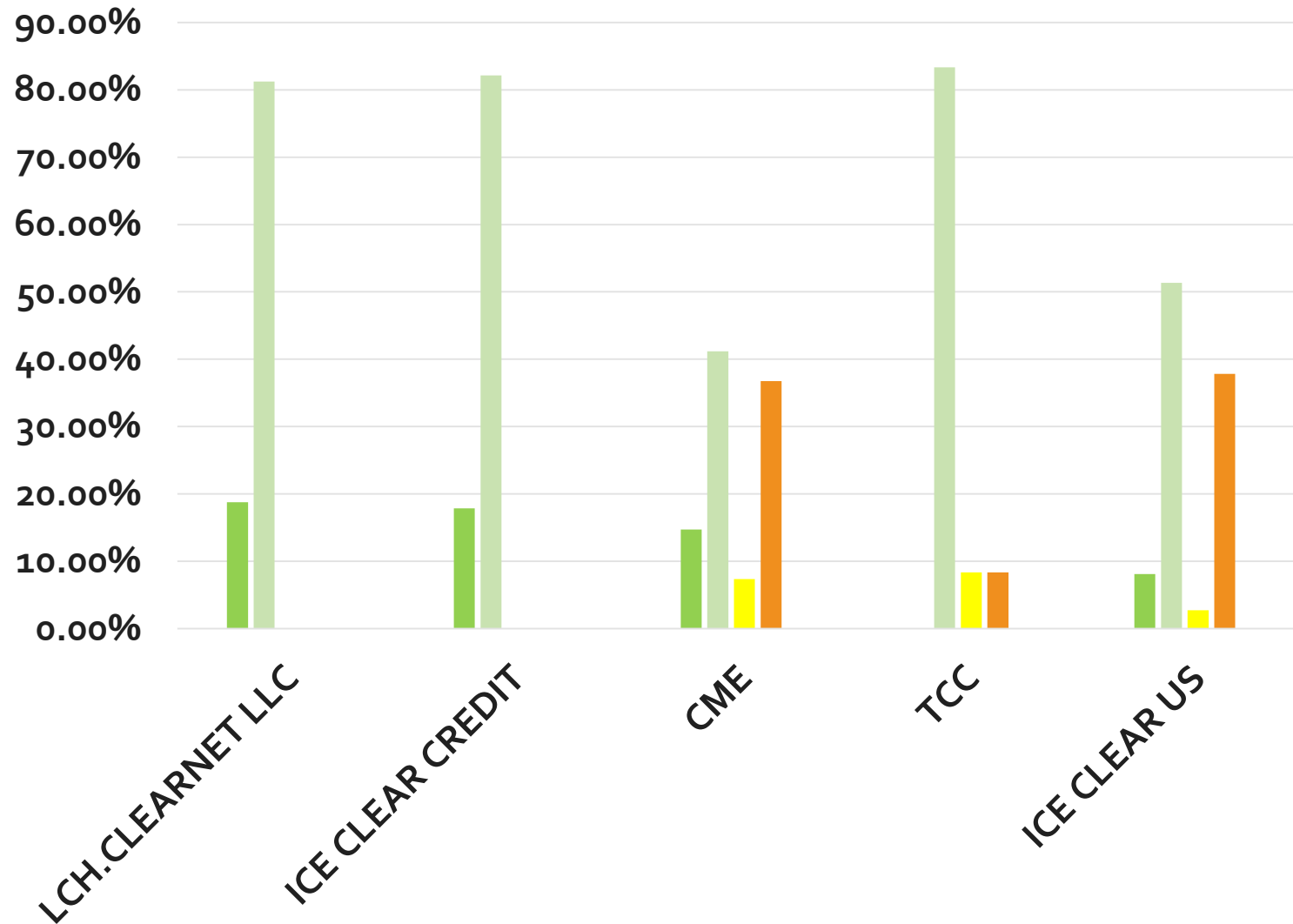
Empirical investigation: 13 major CCPs operating in the EU and the US

- Credit ratings of clearing members as a proxy of financial strength**

CCP	CMs Total	Not-rated CMs	Rated CMS	Percentage of not-rated CMs
CME Clearing US	68	24	44	35.29%
CME Clearing EU	21	2	19	9.52%
Eurex	174	34	140	19.54%
ICE Clear Credit	28	0	28	0.00%
ICE Clear Europe	80	19	61	23.75%
ICE Clear US	37	13	24	35.14%
The Clearing Corporation	12	1	11	8.33%
LCH.Clearnet LLC	16	0	16	0.00%
LCH.Clearnet LTD	156	11	145	7.05%
LCH.Clearnet SA	103	18	85	17.48%
CC&G	80	25	55	31.25%
EuroCCP	48	11	37	22.92%
ECC	21	2	19	9.52%

Standard & Poor's Rating
Traffic lights
AAA
AA
A
BBB
BB
B
CCC

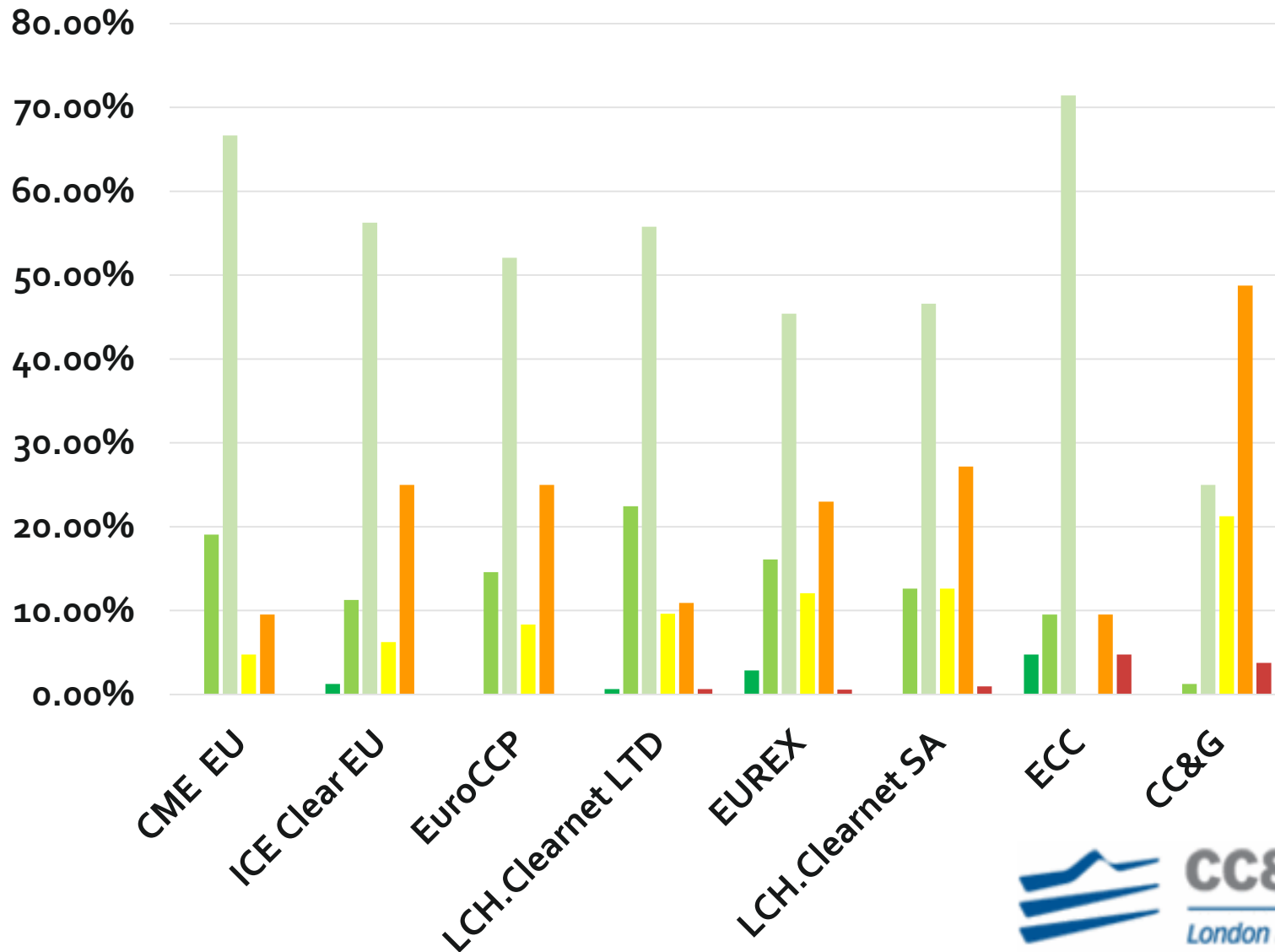
Creditworthiness of clearing members under normal market conditions – US CCPs (average quality, CM heterogeneity)



S&P Rating grade	Basel III DRW (in %)	DP (in %)
AAA	0.05	0.01
AA	2	0.05
A	3	0.09
BBB	6	0.23
BB	15	1.16



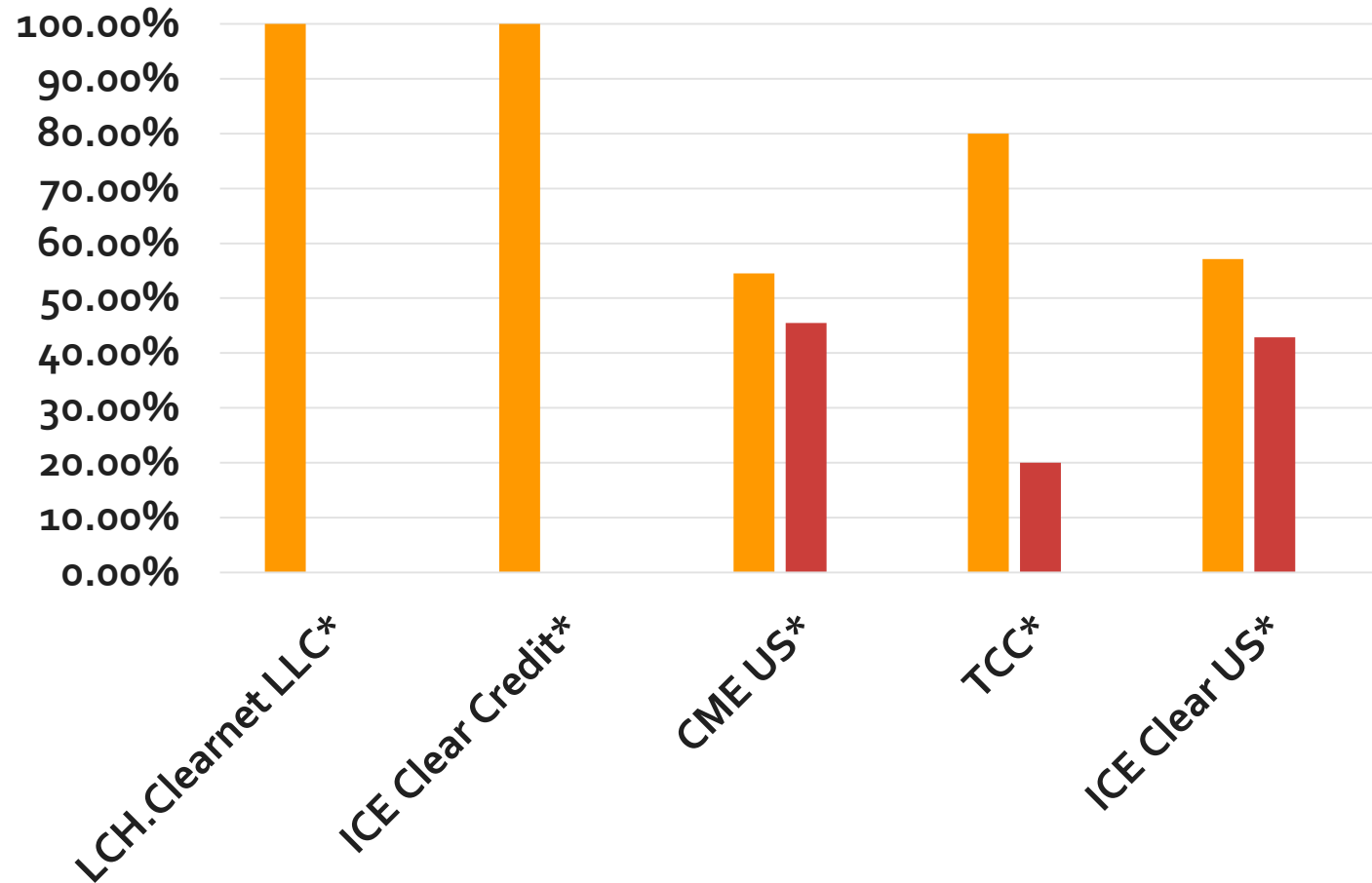
Creditworthiness of clearing members under normal market conditions – EU CCPs (average quality, CM heterogeneity)



S&P Rating grade	Basel III DRW (in %)	DP (in %)
AAA	0.05	0.01
AA	2	0.05
A	3	0.09
BBB	6	0.23
BB	15	1.16
B	30	5.44



Creditworthiness of clearing members under stressed market conditions – US CCPs (average quality, CM heterogeneity)



Conditional default probabilities (DP) of clearing members under cover 2 approach

CM DP conditional on the default of two average CMs (in %)		
CM DP \ DP of average CMs	0.09%	S&P Rating Category
0.05 %	1.83	BB
0.09 %	2.97	
0.23 %	5.84	B
1.16 %	12.28	

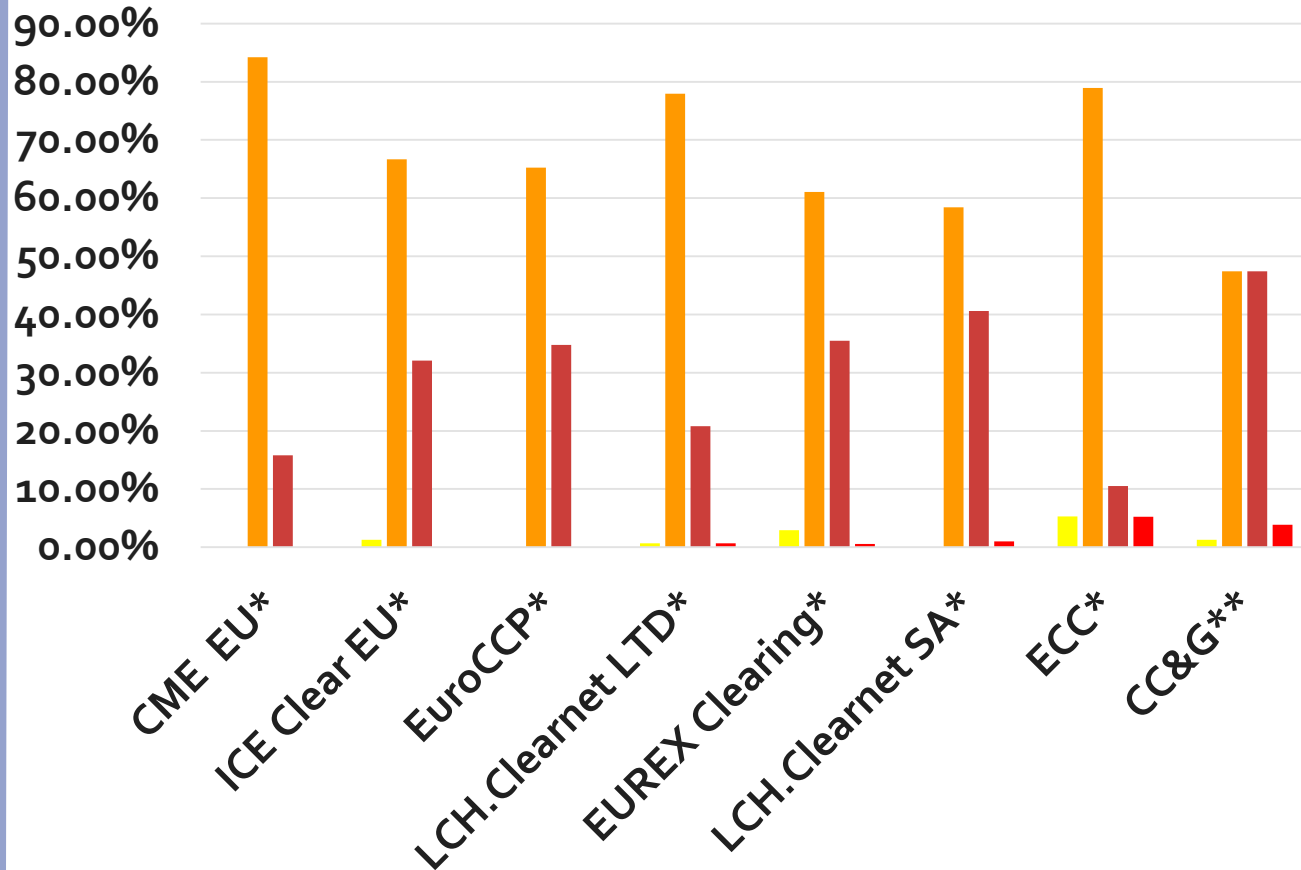
High default probabilities of clearing members under a stressed scenario jeopardise the ability to replenish the default fund



CME Group



Creditworthiness of clearing members under stressed market conditions – EU CCPs (average quality, CM heterogeneity)



High default probabilities of clearing members under a stressed scenario jeopardise the ability to replenish the default fund

Conditional default probabilities (DP) of clearing members under cover 2 approach

CM PD conditional on the default of two average CMs (in %)		
CM PD \ PD of average CMs	0.09%	S&P Rating Category
0.01 %	0.45	BBB
0.05 %	1.83	BB
0.09 %	2.97	
0.23 %	5.84	B
1.16 %	12.28	
5.44 %	25.94	CCC

CM PD conditional on the default of two average CMs (in %)		
CM PD \ PD of average CMs	1.16%	S&P Rating Category
0.05 %	0.75	BBB
0.09 %	1.19	BB
0.23 %	2.42	
1.16 %	7.12	B
5.44 %	17.79	CCC

Creditworthiness of clearing members under stressed market conditions – (average quality, CM heterogeneity)

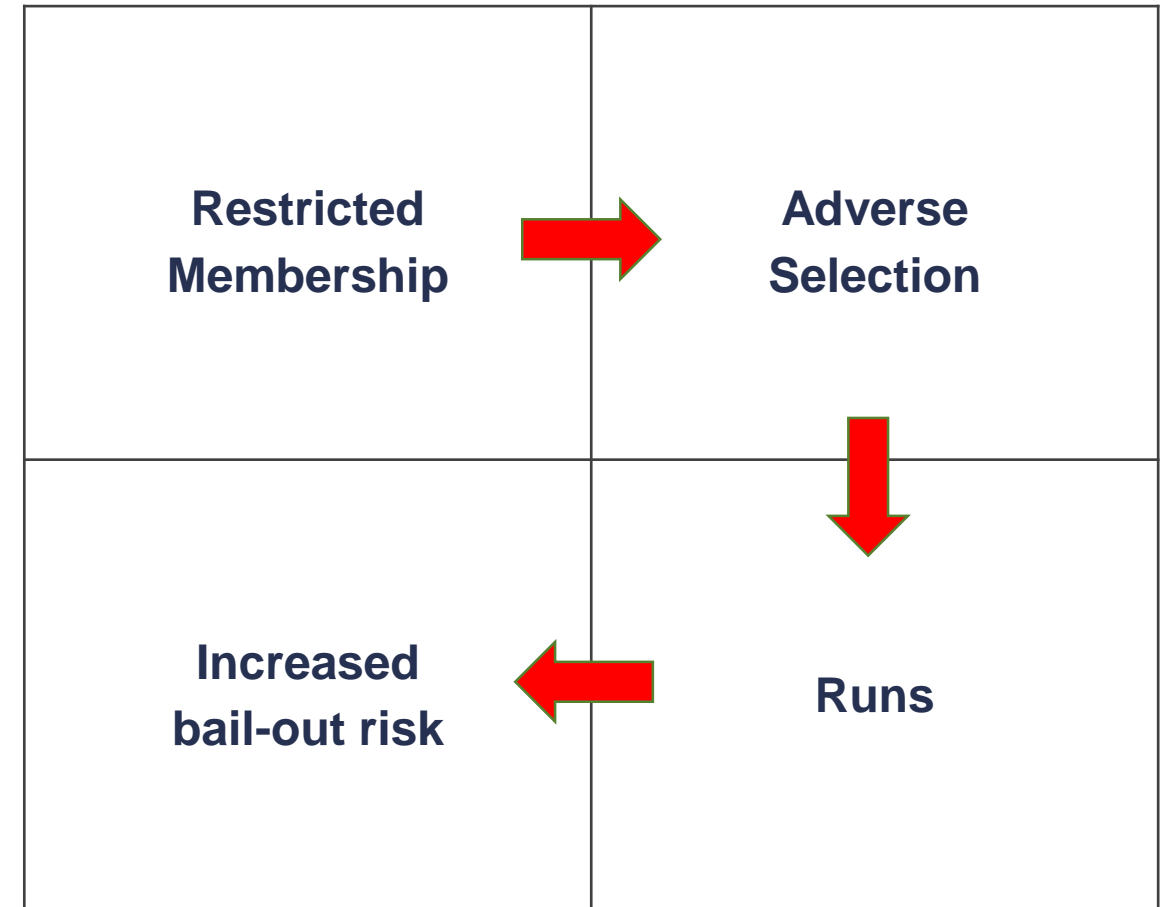
- **High default probabilities of clearing members under a stressed scenario jeopardise the ability to replenish the default fund**
 - Without public subsidies (bail out)...
 - Or without using Initial Margin of non defaulted clearing members ...
 - Enhancing systemic risk: interconnectedness between clearing members
- **Computation of conditional default probabilities**
 - Mapping of default probabilities onto ratings
 - Tasche (2013) and Gordy and Lütkebohmert (2013), Basel III (2014)
 - Conditional default probabilities computed under Basel II & III frameworks
 - Banking book correlations are low
 - Trading book/market implied correlations would magnify default probabilities

Comparing CCP member bases: average credit quality (high/low), heterogeneity (high/low)

Member base consists only of good quality CMs	Member base majority is of good quality, small proportion of low quality CMs	LCH.CLEARNET LLC ICE CLEAR CREDIT	ECC CME CLEARING EU LCH.CLEARNET LTD TCC EUREX
Member base majority is of low quality, only a small proportion of good quality CMs	Member base majority is of good quality, but significant proportion of low quality CMs	CC&G	ICE CLEAR US CME CLEARING US EUROCCP LCH.CLEARNET SA ICE CLEAR EU

Member base quality erosion: do we face a financial stability dilemma, when CM quality erodes?

Member base consists only of good quality CMs	Member base majority is of good quality, small proportion of low quality CMs
Member base majority is of low quality, only a small proportion of good quality CMs	Member base majority is of good quality, but significant proportion of low quality CMs



Conclusion: CCP resilience, clearing membership and regulation

- Ability of a number of CCPs to raise contingent liquidity is questionable
 - Systemic risk difficult to conceal...
 - Are such CCPs able to sustain significant losses without placing an excessive strain on CMs?
- Strength of member base structure is a key factor
 - Should membership eligibility criteria be strengthened?
 - Should qualifying criteria (ESMA, CFTC) be revisited?
 - Why is the ability of a member base to raise funds not considered for (macroeconomic) stress tests?

Conclusion: CCP waterfall design and IM\DF ratio

- Waterfall design must be thought accordingly
 - Integration of risk sensitive default fund add-ons for members with decreasing credit quality into existing frameworks
 - Mitigation of bad incentives
 - Add-ons must be calibrated to avoid procyclicality effects
- Increase ratio of IM to DF?
 - Defaulter pays approach reduces interconnectedness
 - Clarify the status of IM under resolution regimes
 - Positions of CMs with huge client clearing business
 - Large and uncontrolled directional trades
 - DF contributions only provided by CMs, not end-users

Literature

- **CCP vs OTC**

Cont and Kokholm (2014), Duffie and Zhu (2011), Singh (2011),...

- **Contagion and interconnection risks**

Wendt (2015), Pirrong (2014), Yellen (2013), ...

- **CCP resilience and risk management**

Ghamami (2015), Menkveld (2015), Lin and Surti (2015), Budding and Murphy (2014), Cruz Lopez et al. (2014), Murphy and Nahai-Williamson (2014), Pirrong (2014), Nahai-Williamson et al. (2013), ...

- **Prudence of regulatory default fund standard**

Murphy and Nahai-Williamson (2014)

- **CCP resolution vs. CCP recovery**

Duffie (2014), Lubben (2014), Singh (2014), Tucker (2014), Duffie and Skeel (2012),...

Description of the dataset - CCPs

Group	CCP	Geography	Company structure	Ownership structure
CME Group	CME Clearing	US	For-profit entity	Exchange: 100%
	CME Clearing Europe	EU		
	ECC	EU	For-profit entity	Exchange: 100%
	EuroCCP	EU	For-profit entity	User: 25% Exchange: 50% Other: 25%
Deutsche Börse Group	EUREX Clearing	EU	For-profit entity	Exchange: 100%
ICE Inc.	ICE Clear Credit	US	For-profit entity	Exchange: 100%
	ICE Clear Europe	EU		
	ICE Clear Europe	US		
	The Clearing Corporation	US		
LSEG	CC&G	EU	For-profit entity	Exchange: 100%
LCH.Clearnet Group	LCH.Clearnet LLC	US	For-profit entity	Exchange: 60% Other: 40%
	LCH.Clearnet LTD	EU		
	LCH.Clearnet SA	EU		

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