SUMMARY

We put forward a partial equilibrium model of a central counterparty (CCP) and clearing members (CM). Agents are profit optimizing and are exposed to market risk. We simulate the balance sheets and the leverage of the CCP and the CMs as a result of the market price movements. We also model the margin shortfalls and the entire default waterfall in case of CM defaults. Moreover, we analyse the stability of the network of counterparties in a system with and without a CCP. Ultimately, we aim at analysing (i) endogenous feedback effects between CM defaults and market liquidity, (ii) the contagion to non-defaulting CM as well as (iii) the contagion from service functions that CMs provide to the CCPs, such as liquidity provision or collateral and investment services.

SYNTHESIS EXPERIMENTS AND KEY FINDINGS AND CONCLUSION

In this paper, we assess the stability of the system based on clearing collateral exposures via a CCP versus a system of bilateral counterparty exposures. To this end, we put forward a partial equilibrium model of a CCP and clearing members and analyse the propagation of a stochastic market price shock on the stability of the system. We simulate all the layers of the CCP default waterfall and analyse possible feedback loops emerging from the allocation of losses suffered by the CCP on its clearing members. We also demonstrate how a default of a clearing member influences the stability of the network of counterparty exposures and market liquidity in a system with and without a CCP.

MODEL

We present two versions of clearing systems, one with bilateral and one with central clearing, that share the same three fundamental sources of interaction among agents, namely (A) the provision of initial margin (IM) according to the agent’s current open position, (B) the daily settlement of mark-to-market changes in the portfolio values of agents - variation margin (VM) payments, (C) and the default management mechanism in case of a default event.

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CONCLUSION

Given a single CCP network:
- Less defaults overall
- Less 2nd-round defaults (OCF mitigate contagion)
- Price feedback has considerable impact on stability
- Mutualisation of losses has strong stabilising effect
- Results may be less bold in less idealised world (multiple CCPs/ multiple asset classes etc.)
- Framework leads to consistent results

Sounds interesting?

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