

# Summary

During the past decade, both trading and clearing have experienced a large number of changes. On the trading side, the proliferation of trading venues, coupled with the rise of algorithmic trading, has greatly reshaped financial markets. On the clearing side, since the 2007-2008 financial crisis, global regulatory reforms (for instance, Dodd-Frank Act in the US and EMIR in Europe) introduce mandatory central clearing to a large number of financial asset classes, which puts a spotlight on Central Counterparties (CCPs). This dissertation contributes to the literature by studying these new features of trading and clearing.

**Intermediaries and Venues: Connecting End-Users through Time and Space.** The first chapter studies how modern financial intermediaries supply immediacy along both the time dimension and the space dimension. We develop a taxonomy of intermediaries depending on the dimension(s) they connect end-users: time (TimeOnlyInt), space (SpaceOnlyInt), or both (TimeSpaceInt). Frequency domain analysis reveals that different types of intermediaries profit in different frequency patterns. Further analysis on volatile periods and quiet periods shows that intermediaries profit tremendously from volatile periods. The taxonomy of intermediaries proposed in this chapter provides a new perspective on intermediaries' roles in modern financial markets featured with substantial security fragmentation and algorithmic trading.

**Systemic Risk in Real Time: A Risk Dashboard for Central Counterparties.** The second chapter develops a risk dashboard to monitor CCP exposure in real time. Changes

in CCP exposure are decomposed into two types of components: price-related and trade-related components. Price-related components disentangle three risk channels through price variations: volatility changes, correlation changes, and price level changes. Trade-related components include position and crowding risk from house and client accounts. Using data from Nordic stock markets, the tool finds extreme right skewness of CCP exposure changes. Compared to normal times, the CCP faces different risk in turbulent periods, featured by substantial volatility and crowding risk. Moreover, half of crowding risk originates from house-house trades. The tool suggests that the CCP should keep track on volatility changes and crowding risk during market stress periods.

**Central Counterparty Capitalization and Misaligned Incentives.** The third chapter studies incentives and optimal regulation of a profit-driven CCP with limited liability. I construct a partial equilibrium model based on Biais, Heider, and Hoerova (2015). Conditional on available capital, the CCP fine-tunes collateral requirements to balance fee incomes against counterparty risk. High collateral reduces potential default losses, but leads to foregone profitable trades. Limited liability creates a wedge between the CCP's collateral policy and the socially optimal solution to this trade-off. However, regulators can use capital requirements to close the wedge, unless clearing fees exceed a threshold. To the best of the author's knowledge, this paper is the first in the literature that models CCP insolvency from the perspective of CCP's misaligned incentives.