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Information and Core-Periphery Structure in Over-the-Counter Markets

By Nicholas Trachter

My paper "An Information-Based Theory of Financial Intermediation" — recently published in The Review of Economic Studies and co-authored with economists Bruno Sultanum and Zachary Bethune — shows how trading in over-the-counter asset markets is shaped by information asymmetries.

An over-the-counter (OTC) market is a market where investors trade any kind of asset without a central exchange. OTC markets can be quite large. For example, the OTC market for credit default swaps (CDS) exhibit a quarterly trade volume of over $2 trillion. A prevalent feature of most OTC markets — and in particular for the CDS OTC market — is that the trading network of market participants exhibit a core-periphery structure.

A core-periphery structure refers to the notion that some investors are more central within the trading network than others. My paper "An Information-Based Theory of Financial Intermediation," co-authored with Zachary Bethune and Bruno Sultanum, documents that a small set of CDS OTC market investors account for a large fraction of trading volume, participate in a large fraction of the trades and exhibit a trading network that includes a larger set of trade counterparties.

What determines the centrality of an investor in the trading network? Our paper builds a theory where centrality stems from heterogeneity in the ability of investors to understand the trade motives of their counterparties. With this in hand, we confirm that the model delivers a theory of core-periphery trading that is consistent with the data. Further, we also empirically test the key assumption in the model — heterogeneity in understanding the trading motives of counterparties — and find strong support for it.

The Model and Its Theoretical Implications

In the model, investors can hold one or zero assets, and outstanding assets mature at random times. Investors are also able to create new assets and randomly meet with each other. When two investors meet and only one of them is holding an asset, they may engage in trade. In the meeting, the terms of trade are defined bilaterally.

While assets are homogeneous, investors are not. Investors differ in two ways:

- Their valuation of the flow that holding an asset provides, with this valuation being private information of the investor
- Their ability to observe the way trade counterparties value the flow of an asset, with those having a high ability labeled as experts

A key insight is that the level of expertise has strong implications for trade outcomes. Informed investors — those with high levels of expertise — trade with counterparties whenever there are gains from trade. Uninformed investors — those with low levels of expertise — sometimes do not trade with counterparties even though there are gains from trade.

To maximize revenue when they have private information, investors choose a price at which some trades may not occur. This is akin to a monopolist choosing a price that reduces the quantity sold to the market (relative to a firm in a competitive market).

Because low-expertise investors sometimes decline advantageous trades, it follows that the investors with the highest trade volume must be experts. Similarly, these experts are also involved in a larger share of trades and — because they trade whenever there are gains to be had — trade with a larger set of counterparties. In other words, the model provides a theory of core-periphery structure of trade building on information heterogeneity, where experts populate the core of the trading network.

Another interesting implication of the model (also confirmed empirically) is that there is a strong connection between the centrality of an investor in the trade network and its engagement in middleman activity. For example, the most central investors — those experts populating the core — tend to buy and sell assets in equal proportions.

What Happens When Information Frictions Are Relieved?

Information heterogeneity is a principal tenet in the model for delivering the core-periphery structure. Given the importance of the assumption, one may wonder about its validity. Consider two investors — one is an expert, and the other one is not — who meet with a third investor. If private information is present, the expert has a higher probability of trading than the nonexpert.

Regarding CDS trading, some large investors must also file Form 13-F with the SEC every quarter (revealing their asset positions), and the SEC immediately shares this information online. One result of sharing this data is that it reveals the risk-hedging needs of these large

investors. This is information that other market participants in the CDS can potentially leverage when trading with the investors that just filed Form 13-F.

Through the lens of the theory, the effect of this information should be small or muted when the filing investor trades with the expert because the expert likely already knows it, but it should considerably increase the probability of trade with the nonexpert. Our paper presents a large battery of tests confirming these predictions.

Concluding Remarks

Before studying the implications of different policy interventions or regulations, one must understand the structure of a market. Significant amounts of assets are traded in OTC markets, and the trading network exhibits a core-periphery structure. The OTC market for CDS is one of these markets. Our paper shows how heterogeneity in information can create this structure and provides empirical evidence supporting the findings.

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