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Journal of Financial Markets

journal homepage: www.elsevier.com/locate/finmar



Reducing opacity in over-the-counter markets[☆]



Zhuo Zhong*

Department of Finance, Faculty of Business & Economics, University of Melbourne, Victoria 3010, Australia

ARTICLE INFO

Article history:

Received 11 September 2014

Received in revised form

11 June 2015

Accepted 14 June 2015

Available online 22 June 2015

JEL classification:

D83

G14

ABSTRACT

In this paper, I evaluate how a centralized market impacts the opacity of an over-the-counter (OTC) market. I show that a competitive centralized market provides an incentive for dealers in the OTC market to reduce opacity, whereas a noncompetitive centralized market does not. Competition between the competitive centralized market and the OTC market forces dealers in the latter to reduce opacity. With the noncompetitive centralized market, opportunities for collusion provide an incentive for dealers to increase opacity. Specifically, the natural monopoly market maker in the noncompetitive centralized market coordinates his spread according to dealers' spreads to profit from opacity.

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1. Introduction

Over-the-counter (OTC) markets are often opaque, meaning that they fail to publicly disclose information regarding trades. During the 2007–2009 financial crisis, opacity in the OTC derivative markets was blamed for causing the market instability and inefficiency. Hence, in the post-crisis era, many policymakers call for reforms to reduce opacity in the OTC markets.¹ One of the ongoing reforms is to trade standard OTC products in centralized markets.² This can lead to the coexistence of centralized and OTC trading. How does this coexistence affect market making and trading in OTC

[☆] I would like to thank David Easley, Maureen O'Hara, Gideon Saar, Joerg Stoye, an anonymous referee and participants at the 8th Central Bank Workshop on the Microstructure of Financial Markets for their helpful comments.

* Tel.: +61 3 8344 2990.

E-mail address: zhuo.zhong@unimelb.edu.au

¹ See G20 Pittsburgh Summit Declaration, September 2009, G20 Toronto Summit Declaration, June 2010, and Communiqué of Finance Ministers and Central Bank Governors of the G20, October 2011.

² In the United States, the Dodd-Frank Act requires trading standard swaps in “swap execution facilities,” where multiple participants can trade on publicly available prices made by other participants. In Europe, the MiFID II requires trading derivatives on organized venues, known as “organized trading facilities.”

markets? Furthermore, as dealers may benefit from opacity (see [Madhavan, 1995](#); [Yin, 2005](#)), does a centralized market provide an incentive for dealers to reduce opacity (as it is supposed to)? These questions are important for understanding the economics of transparency, as well as for guiding reforms that attempt to increase transparency in OTC markets.

I develop a model where a centralized market operates simultaneously with an opaque OTC market. In the centralized market, a finite number of market makers compete for order flows by posting bid-ask spreads. In a competitive centralized market, the winning market maker sets his spread to deter the potential entrance of other market makers. On the other hand, in a noncompetitive centralized market, the winning market maker, who is not bound by the potential entrance of other market makers, sets his spread to maximize profits. I find that whether the centralized market is competitive or not generates different impacts on the OTC market. While a competitive centralized market causes dealers' profits to decrease under greater opacity, a noncompetitive centralized market leads to the opposite result. The change in the relation between opacity and dealers' profits is due to the change in the relation between the centralized market and the OTC market. Specifically, when the centralized market is noncompetitive, there are opportunities for cooperation between these two markets. Based on these findings, I suggest that regulators should adopt market structures that boost competition among market makers (e.g., the electronic limit order book), as the primary industrial organization for the centralized market.

The model developed in this paper extends [Spulber \(1996\)](#) and [Rust and Hall \(2003\)](#) by incorporating opacity in the OTC market. In the benchmark model, I analyze an economy that consists of the OTC market only. I show that greater opacity leads to larger bid-ask spreads in the OTC market. This result implies that reducing opacity decreases trading costs, thereby increasing market efficiency. However, the welfare analysis indicates that dealers oppose reducing opacity because of smaller profits. Opacity makes investors' outside options ambiguous. As investors with the maxmin preference are averse to ambiguity, they search less. That is, ambiguous outside options due to opacity reduce the value of search. Fewer searches lead to increases in investors' trading costs. Since investors' losses are dealers' gains, dealers profit from opacity.

To explore the impact of centralized trading, I extend the benchmark model to include an additional market -- a centralized market. When the centralized market is competitive, the bid-ask spread in it depends only on the transaction costs of other market makers, and hence, is independent of OTC trading. As a result, the centralized market attracts investors who have to trade but would like to avoid trading ambiguously in the OTC market. Under greater opacity, dealers lose their customers to the centralized market, which decreases their profits.

However, the noncompetitive centralized market changes the above relation between dealers' profits and opacity. The natural monopoly in the centralized market adjusts its bid-ask spread along with changes in dealers' bid-ask spreads. Specifically, the bid-ask spread in the noncompetitive centralized market is positively correlated with the bid-ask spreads in the OTC market. This dependence implies that dealers and the monopoly can collude to increase investors' trading costs so as to profit from opacity.

In addition, I explore how opacity affects the survival of the centralized market. In other words, I study how opacity affects when the centralized market would coexist with the OTC market and when it would not. I find that greater opacity increases the ability of the centralized market to survive regardless of its competitiveness.

I model opacity in OTC markets by Knightian uncertainty, meaning that the odds of future states are unknown. In Knightian uncertainty, it is assumed that the decision maker has a set of priors rather than a unique prior. Thus, the degree of Knightian uncertainty can be measured by the size of the set of priors. In my model, investors, who are decision makers, face Knightian uncertainty because of opacity. The level of opacity is measured by the degree of Knightian uncertainty. In addition, investors adopt maxmin preferences.

Investors act as ambiguity averse when they have maxmin preferences facing Knightian uncertainty. Past studies have shown that ambiguity aversion may arise if decision makers have vague information ([Ellsberg, 1961](#)), insufficient knowledge ([Easley and O'Hara, 2009, 2010a, 2010b](#)), or have adopted incorrect models ([Hansen and Sargent, 2001](#)). Opacity OTC markets means that some trading information (e.g., quotes, trading interest, or order flow information) is unavailable or

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