

Prize Citation for 7th Stephen A. Ross Prize in Financial Economics Awarded by Foundation for Advancement of Research in Financial Economics (FARFE)

The 7th Ross Prize has been awarded to “Over-the-Counter Markets,” written by Darrell Duffie from Stanford University, Nicolae Gârleanu from the University of California at Berkeley, and Lasse Pedersen from Copenhagen Business School. The award-winning paper, which was published in *Econometrica* in 2005, develops a highly tractable and flexible model of price formation, market liquidity, and allocations in Over-the-Counter (OTC) markets. Over the past 15 years, this paper has become a benchmark in the growing literature on over-the-counter markets, with numerous applications in asset pricing, market microstructure, macro-finance, and other related areas. The paper and subsequent literature have transformed our understanding of liquidity and price determination in over-the-counter markets in which many assets are traded.

Over-the-counter trading is an important and often dominant mode of trading in many markets. Examples of assets trading in over-the-counter markets include government bonds, corporate bonds, mortgage-backed securities, municipal bonds, repos, interest rate swaps, currency forwards, various other types of derivatives, and certain equities. In contrast to centralized markets, traders in over-the-counter markets must search for counterparties and bargain over the terms of trade. The paper captures the effect of these frictions in a search-theoretic model, building on the framework that was introduced earlier in the context of labor markets in Diamond (1982) and extensively used in monetary economics (see, for example, Kiyotaki and Wright (1993) and Trejos and Wright (1995)).

In the model, investors have potential gains from trade due to their heterogeneous and stochastic costs and benefits of holding financial assets. They contact other investors or marketmakers randomly, with intensities that reflect their search ability. Once matched with a potential counterparty, traders bargain over the terms of trade. Importantly, investors face bid-ask spreads that depend on investors’ bargaining power and their outside options, which in turn are determined by the investors’ ability to meet other potential trading counterparties, that is, other investors or marketmakers.

Investors that have easier access to counterparties face lower spreads than investors that have more limited access. The paper thus provides a new theory of bid-ask spreads determined by investors’ outside options in a decentralized market with trading frictions, in contrast to previous theories based on adverse selection (see Glosten and Milgrom (1985) and Kyle (1985)) or inventory considerations. Increased trading speed of investors or competitive marketmakers reduces spreads, whereas increased trading speed of a monopolistic marketmaker increases spreads. Therefore, market liquidity is endogenously determined by the extent of competition in a search-based market.

The seminal contribution of Duffie, Gârleanu, and Pedersen (2005), DGP henceforth, spurred numerous applications and extensions of their framework (see Weill (2020) for a recent in-depth review of the related literature). In particular, Duffie, Gârleanu, and Pedersen (2007) show how search frictions can lead prices of financial asset to decline in response to aggregate liquidity shocks, followed by a slow recovery, as agents gradually reallocate securities. Vayanos and Wang (2007) and Vayanos and Weill (2008) explore endogenous concentration of liquidity in search-based models with multiple assets, which

allows otherwise identical assets to trade at different prices and with different liquidity. He and Milbradt (2014) analyze corporate default decisions and prices of corporate bonds in an OTC market with search frictions. Relative to the original setting of DGP, their model emphasizes endogenous fundamentals of the financial assets, and their relation to secondary market liquidity. Gavazza (2016) applies the DGP model to the market for business aircraft, and estimates the effect of search frictions and intermediaries on asset prices and allocations.

Lagos and Rocheteau (2009) extend the DGP model, in which asset holdings are indivisible, by allowing traders to hold unrestricted positions, so that the size of asset holding and trading volume are endogenously related to trading delays. They use the extended framework to model entry of dealers in OTC markets. Weill (2007) and Lagos, Rocheteau, and Weill (2011) model liquidity provision in OTC markets in response to aggregate liquidity shocks. Pagnotta and Philippon (2018) analyze competition among trading venues on trading speed.

Hugonnier, Lester, and Weill (2020) decentralize the market-making sector in DGP and develop a quantitative model of the OTC municipal bond market. Afonso and Lagos (2015) use the decentralized setting to analyze trade dynamics in the market for federal funds. Farboodi, Jarosch, and Shimer (2017) and Uslu (2019) model endogenous formation of the market structure in the OTC market environment with heterogeneous investors.

As illustrated by the examples above, the original model of DGP and the extensions it inspired gave rise to a diverse and growing body of work contributing to our understanding of economic implications of financial market imperfections. We are bound to see further significant developments in this area, with models of OTC markets increasingly used for quantitative analysis. Furthermore, we can expect models of financial market imperfections to play an increasingly important role in the broader context of macroeconomic analysis. The contribution of DGP has paved the way for many developments in this area over the past 15 years, with a lot more progress still ahead of us.

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