A model for troubled times

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Knowledge is power, right? In the case of asset auctions, private information generates more market power than does full information.

Economic times are grim. After the subprime mortgage crisis that began in 2007, banks found themselves confronting a catastrophic loss of trillions of dollars in investments, which drove many financial institutions to the brink of collapse, and, in the case of Lehman Brothers, into bankruptcy.

Three years later, the financial markets have improved, but banks are still facing balance sheets tainted by toxic assets, and confronting an uncertain economic future.

For regulators, treasuries and central banks, questions loom: How effective are auctions in providing liquidity and removing toxic assets from balance sheets? And what should be done about Wall Street's large margins and profits, which come at the expense of the Treasury and the Fed?

In "Asset Auctions, Information and Liquidity," IESE Prof. Xavier Vives proposes and examines a model of a uniform price auction, where bidders compete in demand schedules. He incorporates common and private-value components without exogenous noise. His model attempts to illuminate central banks' response to the financial crisis.

Gray areas

Why are auctions so important? One reason is that they provide liquidity to the financial system. The European Central Bank (ECB) and U.S. Federal Reserve both employ auctions, in

the form of weekly repo auctions and daily auctions, respectively. Indeed, Treasury auctions move a large volume of resources, but they are generally underpriced.

However, the ideal format for auctions to provide liquidity is the subject of some debate. When the financial crisis began, the ECB switched from variable-rate auction tender to full-allotment, fixed-rate tender.

Such gray areas contribute to a current critical quandary: How to keep the government from overpaying for toxic assets, while still managing to remove those assets from the balance sheets of troubled banks?

The difficulty of auctions

Central banks rely on liquidity auctions for two main purposes: to inject the right amount of money, so the short-term rate stays on target; and to give banks enough liquidity.

There are two main types of auction: fixed-quantity and fixed-price. A fixed-quantity auction controls the aggregate amount of money injected and involves a price discovery to elicit the values for banks' liquidity. A fixed-price tender indirectly controls the money injected and eliminates inefficiency in liquidity distribution, thanks to competitive bank bidding.

In a crisis, fixed-rate tender is generally preferable, so banks have enough liquidity. Following Lehman Brothers' collapse, the ECB accepted banks' demands in full at a fixed rate, rather than following the usual auction procedure, where banks bid for money and thereby set the interest rate. Indeed, a central bank's optimal demand schedule should increase its elasticity when the information problem is more severe.

One difficulty of auctions is that bidders are unsure of the value of an asset. The author's model of a uniform price auction allows for a pure common value, pure private values and independent values, which assist in estimating potential profits. Bidders maximize expected profits and submit demand schedules, and the auctioneer selects a price that clears the market.

Once a price is established, bidders' behavior may vary. The response to a price increase is to reduce the amount demanded, but only moderately — a high price conveys the good news that the average valuation is high.

On the other hand, a bidder avoids competing aggressively with his demand function, because a low price conveys the bad news that valuations are low.

The problems of too much information

It is clear that private information is more powerful than full information, and the market tends to collapse when the common value element is more important, signals are noisy and/or prior uncertainty is low.

One key result of the model that relates to a crisis situation is the following: the more severe the information problem, or the more costly it is to put up more liquid collateral, the steeper are demand functions, the larger are the equilibrium margin and the amount of bid sharing, and the more inefficiently the funds are allocated.

The author's model also accommodates supply bids for an inelastic demand, that is, reverse auctions. In 2008, Henry Paulson proposed using reverse auctions to remove toxic assets from balance sheets, to remove legacy loans and to absorb excess liquidity. Reverse auctions serve a price-discovery purpose, enabling the Treasury and banks to optimize their decision making around buying and selling.

Though this model warrants a great deal more in-depth assessment, it's clearly a valuable tool for central banks seeking to formulate their most strategically sound response to financial crises.

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