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On Dealer Markets Under Competition: Discussion

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conditions under which a dealer would prefer to trade at a market bid or ask price rather than post his own quote and wait for an incoming market order. In a multidealer environment, there is an incipient "gravitational pull effect" that limits the divergence of inventories and thereby limits the divergence of reservation prices of dealers. The "gravitational pull effect" is incipient because the flow of incoming orders will be traded in a way that keeps inventories of different dealers from diverging very far. There may be an actual gravitational pull effect for new entrants with an unbalanced inventory. The new entrants will choose to trade with a dealer rather than place their own limit order under conditions specified in the paper.

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DISCUSSION

JAMES C. VAN HORNE*: The paper presented by Professors Ho and Stoll should be placed in perspective as an extension of a paper written about the same time by the authors entitled, "Optimal Dealer Pricing Under Transactions and Return Uncertainty," (working paper, Wharton School, October, 1979) and an earlier paper by Professor Stoll which appeared in the *Journal of Finance* in September of 1978, "The Pricing of Security Dealer Services." In the previous joint paper, the authors analyzed the optimal bid-ask price setting behavior of a single dealer in a single stock. The dealer trades only with the public in a multiperiod setting where demand is stochastic. In that paper, the authors allow for asymmetric demand where expectations of the stock's true price differ between the dealer and the public. While my comments will pertain mainly to the paper presented, some have implications for the previous papers as well.

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As we know, the present paper first involves two dealers and then more than two dealers in a one-period setting. Trading takes place under highly restrictive assumptions. Given these restraints, the paper makes a worthwhile contribution in showing how dealers interact in setting bid and ask prices. The observations the authors make with respect to the market bid-ask spread and to the gravitational pull effect, which limits differences in inventories and in reservation prices, are most insightful. In particular, I liked the market making implications drawn when there are more than two dealers. However, the setting in which all of this takes place is so restricted as to raise questions as to whether the generalizations made reflect a realistic dealer equilibration phenomenon.

What we have is a partial equilibrium framework which, to an appreciable extent, obscures the economic role of a dealer in macro finance. Expectations as to the true value of the stock are assumed to be homogeneous on the part of the dealers. Differences in expectations among dealers, which we would expect to prevail, will lead to different bid and ask price setting behavior than that suggested by the model. No mention is made of whether the public also have homogeneous expectations, but one suspects that they must have if the results of the model are to hold. The introduction of heterogeneous expectations would result in a complex blending of base wealths, covariances, expectations, and the utility preferences of dealers and the public. However, the generalizations possible would be richer and, in my judgement, more worthwhile than is possible with the present model. I would encourage the authors to extend their work in this direction.

The assumption of perfect information about the wealth, inventories, and, particularly, the utility preferences of other dealers is troubling. In a rapidly changing market characterized by numerous transactions, this assumption is unrealistic even in the case of a single stock. While I suspect that this assumption must be invoked if the Ho-Stoll model is to have predictive power, I find it disturbing in describing the underpinnings of dealer behavior.

It would seem that the appropriate risk measure for the individual stock in the section entitled, "Dynamic Programming Problem," would be systematic risk if the dealer, as assumed, holds a well diversified portfolio for his base wealth. However, I am unable to find any mention of how this risk is measured.

In the last section the authors comment on what would likely happen if the model were extended to a multiperiod horizon. This is an important dimension, because we know that future demand affects a dealer in present inventory and bid-and-ask price decisions. I would urge the authors to pursue this dimension with a rigorous extension of their model.

In summary, there is much of value in the paper in providing a better understanding of the behavior of dealers. I feel that some improvements can be made and would like to see some of the restrictions on the model relaxed. It is only if we can approximate the real world conditions under which a dealer operates that generalizations from a model such as this are likely to be relevant.