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Comments on "The Economics of Markets: A Simple Model of the Market-making Process"

Markets rarely emerge in a vacuum, and potential traders soon discover that they may spend more time, energy, and other resources discovering or "making" a market than on the trade itself. This predicament is shared equally by currency traders, do-it-yourself realtors, and streetwalkers! Their dilemma, however, seems to have gone largely unnoticed by economists, who simply assume that somehow traders will eventually be appraised of each other's existence—to their mutual benefit or subsequent regret. Will such markets emerge? At which costs and whose costs? Under what conditions? Using a simple two-trader model, J. P. Gould (this issue) analyzes some of the determinants of the market-making process. His model attempts to relate the amount of resources ("search expenditures") expended in market seeking to the gains from trade accruing to each party. The hypothetical nature of eventual trading is not forgotten, as each trader finds his counterpart with only some probability. Finally, this probability depends directly on the amount of resources devoted to the search. To clarify some of the issues addressed herein and the conclusions drawn in this paper, we first summarize the main results of this model before examining some of the key concepts bearing on this study.

Main Results

Resource Allocation Issues

To what extent are gains from trade to each party helping the market-making process? Or, put another way, will such gains impact positively on the search effort measured by resources expended in searching? To deal with this problem involves a recognition of the *joint* search effort of each party and the public-good aspect of the market—as it benefits one to rely on the other's efforts. A Cournot-Nash assumption

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is made—with all the ambiguities involved in a repeated-play situation—to yield the result that the search expenditures will vary directly with the gains to the first trader and inversely with the gains to the second trader if the process is to be stable. It is also pointed out that small enough gains may result in a "no-market solution."

Allocative Efficiency Issues

Allocative efficiency issues arise from the fact that the market-making process is uncertain and both traders may never meet. This is modeled by a probability of trade occurring (π in Gould's notation) as a function of gains from trade. Under similar conditions—stable Cournot-Nash equilibrium—an increase in gain from trade to the first trader does not necessarily lead to a higher success (i.e., trading) probability. Even more disconcerting is the fact that a simultaneous increase in gains to both parties is not more likely to increase the trading probability. The problem is, of course, the inherent public-good aspect of market making as it is modeled herein. An increased individual search effort may lead to enough reduction in the other party effort to bring about a reduction in overall probability of trading. In the terminology of public economics, being a free rider may carry a price; sufficient understatement of one's preference for a public good may result in nonprovision of the good. This is precisely why the issue of the solution concept adopted for this game becomes of paramount importance. In a Nash situation the results of a two-trader model do leave much uncertainty about the effect of greater search, but this is not necessarily so in general. Different (potential) market structures would lead to alternative findings. The difficulty is, of course, that presuming we already know something about what kind of market might eventually emerge skirts the issue of market making. If information is indeed available to the traders about other participants, such information did not materialize out of thin air; someone on either side—or some middleman—must have sought this information, and resources were expended in the process.

Some Fundamental Issues: Gains from Trade versus Costs of Trading

Can we say that the gains from trade are well defined for each trader? To make the concept useful in such a model we must have access to his utility function to determine how different prices would affect him. This is true if we assume nontransferable utility. The situation can be depicted in an Edgeworth box as shown in figure 1.

In this representation there are two goods, X and Y, to be distributed through exchange between Mr. A and Mr. B. Any point in this rectangle represents a feasible allocation to these two traders. The origin of the axes, measuring the amount of X going to Mr. A, X_A, and the amount of

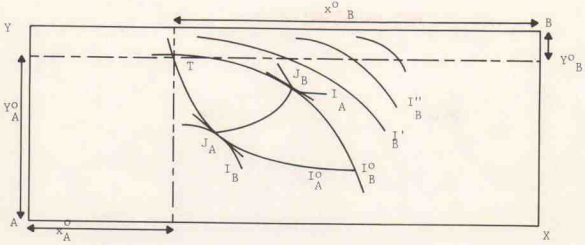

FIG. 1

Y, Y_A, is the lower left-hand corner A. Similarly, the upper right-hand corner, B, represents the origin for Mr. B so that increasing amounts of both goods accrue to Mr. B as we move down and to the left, while Mr. A's share is thereby reduced. Preferences over points (allocations) in this box are depicted by traditional shape indifference curves, that is, loci of points of equal satisfaction. Now if the original allocation is T, Mr. A's allocation is $(X^o_A; Y^o_A)$ and Mr. B's is $(X^o_B; Y^o_B)$. This point is at the intersection of two indifference curves; I^o_A for Mr. A and I^o_B for Mr. B. Note also that being a point of intersection, rather than tangency, of these curves, the slopes at T of I^o_A and I^o_B differ. But now these slopes represent the marginal rate of substitution between A and B for each trader at that point—that is, the rate at which one good must be substituted for the other for each trader to remain on the same indifference curve. Quite obviously, by refusing to trade both traders can ensure themselves of the outcome T. The only move that is jointly beneficial to both A and B has to be into the lens-shaped area delimited by I^o_A and I^o_B. At most A would not object to moving from T to J_A which is the point of tangency of I^o_A and I_B a higher indifference curve for B, who thus stands to derive all the benefit from trade. Tangency here means equilibrium in the sense that the two traders' rates of substitution between A and B are now equalized, meaning that the rate at which A needs to obtain extra X to compensate for amounts of Y less than his initial Y^o_A is just equal to the rate at which B is willing to give up X in exchange for extra Y. No further reallocations are mutually beneficial. Conversely, J_B is the point of tangency of I^o_B and I_A if all the benefit of trade were to accrue to Mr. A. Inasmuch as it describes all points of tangency between the two systems of preferences depicted by these indifference curves, J_AJ_B is a privileged curve. Note also that the rate of substitution can be thought of simply as a price system, as it describes the price of one good in terms of units of the other.

One way to model market emergence is to ask what not knowing the

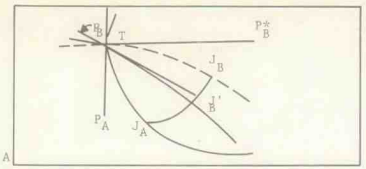

FIG. 2

existence of another trader, say, Mr. B, means to the first trader, Mr. A. What it means is that A does not know the system of preferences I^0_B, I'_B, and so forth. Put another way, not having someone to trade with is essentially equivalent to saying that the original distribution of resources is perceived efficient so that current prices leave no room for recontracting—as would be the case if I^0_A and I^0_B were tangent at T.

Now we are in a position to speak of the gains from trade and resources expended on searching. Consider the segment $J_A J_B$ on the contract curve. It is, of course, well known that in such a model little can be said about the eventual point on this segment that will obtain. In other words, any price system associated with these points could emerge. It is usually argued that bargaining skills and other extraneous factors will determine the eventual outcome. One way to take joint account of the search cost and the net gain from trade is to say that instead of starting at T and having $J_A J_B$ as the effective range of solutions opened to A if he does trade, A perceives B's preferences in a different manner, restricting the range of solutions to $J_A J'_B$. In terms of prices he perceives P_B as Mr. B's rate of substitution of T, whereas P^*_B is the true state of the world (see fig. 2). Conceivably, P^*_B might be uncovered by A but at a cost. Following this presentation, the probability of trading can be stated as probability of certain prices occurring. For what we have is a range of prices consistent with the emergence of trade, and discovery of this range is a costly process which involves restricting the effective equilibrium price range from θ^* to θ as illustrated in figure 3*a* and *b*.

Thus it is argued that analyzing the market-making process requires the analysis of a game with imperfect information. In fact it is but one scenario for the general problem of informational efficiency of decentralized systems as pioneered by Hurwicz (1972). The same issues of incentive compatibility in different market structures arise; for example, can we say that competitive systems, inasmuch as they may lead to price-taking behavior with no incentive to misrepresentation, are the most likely to sustain trade in each individual case? Is this so because of some allocative efficiency: small search cost versus large benefits? Are noncompetitive situations as hopelessly indeterminate in general

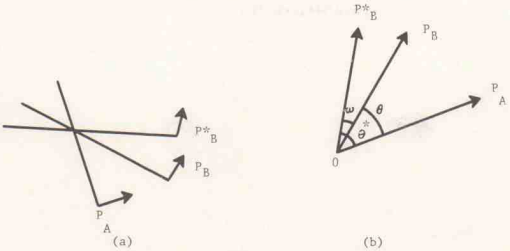

FIG. 3

as games with imperfect information? What informational assumptions and/or behavioral postulates—Cournot-Nash versus Bayesian players, for instance—could reduce such indeterminacy? One set of such assumptions has been shown to lead to rather ambiguous results in this paper. It is likely that the literature on informational efficiency and decentralization has much to offer—if not in the way of hope, at least in the way of soberness—in the study of the market-making process.

Reference

Hurwicz, Leonid. 1972. On informationally decentralized systems. In C. B. McGuire and R. Radner (eds.), *Decision and Organization*. New York: North-Holland.

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