



American Finance Association

Toward a Theory of Financial Accounting: Discussion

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Source: *The Journal of Finance*, Vol. 35, No. 2, Papers and Proceedings Thirty-Eighth Annual Meeting American Finance Association, Atlanta, Georgia, December 28-30, 1979 (May, 1980), pp. 547-551

Published by: Blackwell Publishing for the American Finance Association

Stable URL: <http://www.jstor.org/stable/2327415>

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DISCUSSION

MARK A. WOLFSON:* The Ohlson-Buckman (1979) paper (hereafter O-B) and the Hakansson-Kunkel-Ohlson (1979) paper come very close to concluding a chapter which Hirshleifer began to write almost ten years ago. The chapter analyzes the role of public information in a single-good, two-period pure exchange economy in which agents have equal endowments of information. Since some of us were getting a little tired of reading additional sections of the chapter and were even becoming a little confused about the role of public information in this context, the O-B paper provides a welcome synthesis.

Besides this contribution, the present paper, taken largely from the front end of O-B, adds important insights by moving towards what Reiter (1977) has recently referred to as the new (squared) welfare economic perspective. This general equilibrium approach views the choice of economic system as endogenous to society's resource allocation problem.¹ The research efforts which preceded O-B were in the spirit of the (older) new welfare economics, which operated in the context of a single, exogenously specified market regime. Ohlson and Buckman point out that the effects of information on resource allocations must be consid-

* Stanford University. I am grateful for helpful discussions with Joel Demski, David Kreps, and James Patell.

¹ See Hurwicz (1972, 1973) and Reiter (1977), among others, for a discussion.

ered in a number of different exogenously specified market regimes, since the results may differ from case to case. The newer welfare economic approach goes one step further: it encourages the construction of allocative mechanisms *within* the model, and therefore may greatly increase the likelihood of empirical testability of the model's predictions. An excellent case in point is the Harris-Townsend (1978) paper.² Indeed, the newer welfare economic approach seems right on target if our ultimate goal is the explanation of the existence of the myriad economic institutions that we observe today.

The natural question which arises at this point is, "Which piece of the economic puzzle should be studied next?" The answer requires an understanding of the relative difficulty in bringing each of the pieces into focus. To begin that discussion, I will briefly consider what some of the other puzzle pieces must look like.

The most interesting and most challenging alterations to the model occur when agents are differentially endowed with private information or differ in terms of what events they can observe. The economics literature suggests that market behavior in this context is fundamentally different from that in which agents have strictly homogenous information. For example, when preferences are unobservable, price-taking may not be incentive compatible behavior; a moral hazard problem may arise to the extent that agents perceive an ability to make better trades through misrepresentation of their preferences. Such strategic gamesmanship opportunities suggest that the Walrasian market mechanism may yield inefficient allocations.

When differences in information are introduced, fundamental changes in the mechanism will be required. The modeling of sequential trading processes may be fruitful here, with the possibility that disequilibrium trading will be the vehicle by which much of the private information in the economy is "communicated". However, at present, proper characterization of game forms, and hence solution concepts, remains an elusive goal.

Ohlson and Buckman suggest that there are three concepts of efficiency presently in use: full allocational efficiency, constrained Pareto efficiency, and social Nash optimality. These efficiency concepts really make sense only in games without differential information; the introduction of differences in information requires new notions of efficiency which will depend upon the nature of the communication which takes place among the agents. With no communication allowed prior to trading, Wilson (1978) introduced the concept of coarse efficiency (Kobayashi (1977) calls it conditional efficiency); and with *full* communication of private information prior to trading we have Wilson's concept of fine efficiency.

As our analysis moves away from classical economies, we continue to discover cases in which ordinary market mechanisms falter. Given the existence of the S.E.C., the F.A.S.B., the I.R.S., and the A.C.E.,³ and other collective decision-making agencies, it is essential that we develop a better understanding of the problems caused by the involvement of governments and planning agencies in

² For other recent examples, see Harris and Townsend (1979), Myerson (1979), and Christensen (1979).

³ Joel Demski's acronym for "area coordinator of everything".

the allocation process. We must consider the possibilities that the central decision-maker is not benevolent and that individuals and coalitions have incentives to conceal or misrepresent the information requested by the central planner. In addition, we must recognize that communicating information and setting up proper incentives are costly activities which must ultimately be incorporated in the analysis.⁴ A recent book by Green and Laffont (1979) provides a synthesis of work on the design of individual and group incentive-compatible mechanisms for eliciting private information for social decisions. Although there exist few encouraging results in this area, one useful characterization has been provided recently by Christensen (1979). He demonstrated in a very general principal-agent setting that a game with differential information in which the agent's strategy includes communication of a message, can be equivalently represented as a game in which the agent truthfully communicates his private information, but where the allocations are restricted to a subspace of the allocations that are feasible in the original game. (This simplifies the task of characterizing optimal contracts, which are endogenously determined.) Private information can be elicited, but only if there is a commitment by the principal to "underutilize" the information. An analogy can be drawn here with the plea bargaining process. Truth-telling is individually incentive compatible only with guarantees that the information will not be (fully) exploited to prosecute the informant. Here, we are clearly in a second-best world.

As Ohlson and Buckman suggest, we must also begin to consider cases involving more than two periods and more than one commodity. In pure exchange economies, Radner's (1972) rational expectations equilibria (of plans, prices, and price expectations) have been the central focus. Virtually all of the work to date takes the information structure as exogenously specified; of course, most of these are pure exchange models, and information generation or collection is a type of production.⁵ Accountants have a natural interest in extending this line of research by making the information system endogenous.

It is clear that we will have to be very careful in conducting welfare analyses in sequential markets. When the sequential markets are incomplete at each date, the concept of social Nash optimality may provide a good characterization of equilibrium, but it is not a good welfare criterion in the sense that there can exist two social Nash optima in the same economic system, one of which dominates the other in terms of social welfare.

Another question addressed by O-B, very much in the spirit of the newer welfare economics, is the determination of the minimum number of securities or minimum dimension of the message space required to achieve a "benchmark" level of efficiency. Of course, we should be careful in appraising analyses which derive the minimum dimension of the message space required to achieve what Hurwicz (1973) refers to as "naive utopias", such as a complete spanning of the state space (in which case full allocational efficiency can be achieved). Spanning

⁴ While these considerations are apparent when there is a central agency involved in the allocation process, the cost of communication and enforcement is an important consideration in market mechanisms as well.

⁵ See Kreps (1979a, b) for a synthesis and some extensions.

the state space may remain a theoretical construct which cannot even be approximated in reality. When individuals are uncertain about future preferences, when they possess differential information, or when individuals differ in their ability to observe events, it is impossible to open all the markets that would be required to provide insurance against all uncertainty, even if each market were costless to open and operate. Positive transaction costs only further encourage incompleteness. The moral of the story is that when we are in a second-best world, it makes little sense to use first-best benchmarks to evaluate the allocations resulting from proposed mechanisms.

The one criticism in the present paper which seems a bit unfair is the discussion of stock price reaction studies. The statement that wealth effects (through stock price changes) have no *direct* relationship with individual welfare is a perfectly correct one (indeed a stronger statement can be made: a price change for a particular security is neither necessary nor sufficient for a signal to induce a change in any or all state-date resource allocations). Still, changes in wealth are far from independent of individuals' welfare, and as Beaver (1979, p. 27) has recently stated, "changes in security prices are one of the empirically observable manifestations of the ability of financial data to alter investors' beliefs and hence provide empirical evidence of the information content of financial data." While I share the authors' concern about interpreting the social welfare implications of these information content studies, I would also assert that the authors' proposed paradigm does not lend itself to empirical testing nearly as well as does the wealth perspective.

Many more chapters will be written before the role of financial accounting information in the allocation of resources is well understood. The newer welfare economic paradigm, toward which this paper moves, does not yet permit rapid problem-solving, but it does admit the possibility of some real progress.

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