

G. Chichilnisky (ed.) `Markets, Information and Uncertainty: Essays in Economic Theory in Honor of Kenneth J. Arrow´

Kenneth Arrow has made seminal contributions to the fields of market economics, social choice and welfare economics, the economics of uncertainty and information, and mathematical programming. This book in honor of him contains a variety of essays on these topics. It emerged from the celebration of Arrow's seventieth birthday. It consists of seventeen chapters, ordered in three categories: Information and Markets, Uncertainty and Finance, and Market Externalities and Justice. It comes as no surprise that the list of contributors to the volume is impressive: Arrow, Danilov, Koshevoy, Sotskov, Drèze, Hahn, Chichilnisky, Huang, Wu, Heal, Phelps, Linhart, Radner, Starr, Stinchcombe, Heller, Uzawa, Starrett, Cordella, Minelli, Polemarchakis, Hammond and Coughlin. Since it is impossible to do justice to all the contributions in the book, I will restrict myself to a discussion of one paper in each of the three categories.

The paper "Information and the Organization of Industry" by Kenneth Arrow argues that the role of information as a source of productivity and as a source of value is increasingly exemplified in many markets. Arrow links two concepts, the role of information as an economic commodity and the identity of firms as loci of knowledge and claims to wealth. He argues that it is difficult to make information into property. Intellectual property rights have a very limited power. There are many paths by which knowledge is diffused. The firm can also be thought to be a locus of knowledge. The knowledge that is most important is largely embodied in individuals, who constitute the information base of the firm. The explanation that embedded information is capital therefore depends on the slow mobility of information-rich labor. Very often, however, information leaps over from one firm to another. According to Arrow we are just beginning to face the contradictions between the systems of private property and of information acquisition and dissemination.

The paper "The Formulation of Uncertainty: Prices and States" of Jacques Drèze compares the modeling of uncertainty by the theories of general equilibrium with incomplete markets (GEI) and temporary general equilibrium (TGE). Modeling of uncertainty takes place by describing the possible future states of nature. On the one hand the definition of states must be comprehensive enough that market-clearing spot prices for commodities conditional on the realization of a state are well-defined, on the other hand states must be defined with interpersonal objectivity. This creates a modeling tension, which can only be solved by dropping one of the two requirements. Drèze's interpretation is that TGE has dropped the former requirement and GEI the latter. Nevertheless, Drèze argues that the differences between the GEI and TGE approaches are of second order. His conclusion is that research effort should be devoted to use either approach to come to a positive theory of price-level determination and an extension of GEI to noncompetitive market clearing and endogenous uncertainty.

Geoffrey Heal discusses organization issues in industries characterized by network externalities in his paper "Price and Market Share Dynamics in Network Industries." Networks play an important role in many sectors. Examples in the financial sector are the communication infrastructures that are needed to carry out financial transactions. Heal extends earlier work on the modeling of network industries by integrating

critical mass and bandwagon effects in a single framework, analyzing market share dynamics under a reasonable model of consumer choice between networks, and providing the beginnings of a model of optimal intertemporal network pricing. He concludes that there are strong tendencies toward monopoly. Critical mass effects, however, imply that it is possible that an industry does not take off at all. Interconnection between networks makes only quantitative, but not qualitative changes to this picture.

The book contains many more interesting essays. Several contributions focus on endogenous uncertainty. The other papers are as diverse as the formal modeling of information goods, existence of equilibrium unemployment, timing of technology adoption, money as a medium of exchange, incompleteness of markets as an equilibrium phenomenon, optimal dynamic government policy, the appropriate social rate of discount, welfare enhancing effects of international trade, strategic effects in intertemporal economies, and distributive justice in representative democracies. Many of the papers are provocative and challenging. Several indicate possibilities for a new research agenda. The common ground of all of them is that, in one way or another, Arrow made seminal contributions. I found the book highly interesting and would like to recommend it to everyone in the strongest possible terms.

Jean-Jacques Herings