Book Reviews

Essays in the Theory of Risk-Bearing. By KENNETH J. ARROW. Chicago: Markham Publishing Co., 1971. Pp. vii+278. $10.95.

This volume consists of a collection of twelve essays which Professor Arrow has published during the past two decades. The subject matter of the book can be divided into two parts: (*a*) theoretical contributions to decision making under uncertainty, (*b*) applications of the theoretical methods to a variety of economic problems. Without doubt, the book strikes a very good balance between the formal theory and the economic applications. As a result it contains material and ideas that are not only important to specialists involved in research on various aspects of the economics of uncertainty, but also of interest to the more general reader who wishes to obtain some acquaintance with the recent advances in this area, and in particular with questions of how the market allocates risk.

The theoretical contributions to decision making under uncertainty are contained in the first three chapters. Appropriately, the book starts with Arrow's 1951 *Econometrica* article, "Alternative Approaches to the Theory of Choice in Risk-Taking Situations," which is a survey of the state of the arts existing at that time. This is a useful starting point since there is a tendency on the part of modern writers in the area to ignore these earlier contributions, and it is therefore good to be reminded that concepts such as risk aversion were known in the time of Marshall.

Chapters 2 and 3 consist of the first two of Arrow's 1965 Helsinki lectures, although Lecture I has been substantially expanded. Chapter 2 develops a formal exposition of the theory of choice under uncertainty, based on the state-preference approach, and most of it is devoted to developing the expected utility and personal probability theorems. It is undoubtedly the most difficult chapter in the book. This is followed by his recent work on the theory of risk aversion which has influenced so much of the development in the economics of uncertainty. This paper is particularly welcome because of the fact that, despite its importance, it was previously rather inaccessible.

The remainder of the book deals with the applications to economic problems. Chapter 4 is a reprint of the author's well-known article on the optimal allocation of risk bearing, although some new ideas have been added pointing out some difficulties of extending the analysis to production. The basic conclusion of this analysis is that in the presence of perfect security markets (one for each state of nature), the competitive system will lead to an optimal allocation of risk bearing.

The next essay, which is Lecture III of the Helsinki volume, deals further with the question of the allocation of risk bearing, which is the essence of insurance, and points out the limitations of the price system to handle risk bearing adequately. Several reasons for the incomplete development of insurance markets are discussed. The most important is that of "moral hazard," which is the idea that perfect insurance would reduce incentives on the part of the insured, thereby raising the risks to the insurer above those upon which the original insurance agreement was based. In view of this he argues in favor of partial risk shifting or "coinsurance."

Further difficulties of insuring against risk are examined in the next five essays in the context of a number of examples of risky economic undertakings, namely the areas of invention, technological knowledge, medical care, and the control of large organizations. These essays all have a strong underlying theme. The incomplete shifting of risks is due, at least in part, to this question of "moral hazard" and the fact that complete elimination of risks would reduce incentives.

Chapter 11 is a recent paper dealing with the effects of uncertainty on the evaluation of public investment decisions. The main results here are that if returns from investment projects are independent of the other components of national income and if there exist perfect markets for claims contingent on the states of the world, then the government should behave as an expected value maximizer. This immediately leads back to the question of why such markets do not exist and the underlying theme of the previous chapters. However, even in the absence of such markets, when risks are publicly borne, the government should still ignore risks, basically because of its ability to spread them. Where risks are borne by private individuals this result is not true, and in that case some adjustment for risk should be made in evaluating a project.

There can be little argument that this volume contains some of the most important contributions to the theory of risk bearing. Moreover, while it would have been so easy for such a collection of essays to make very disjointed reading, this is not the case. On the contrary, the transition from the theory of decision making under uncertainty, through the analysis of an idealized economy to the discussion of the various limitations of the actual economic system is delightfully smooth. Indeed we are all fortunate that Kenneth J. Arrow has decided to put together in one place this important collection of essays.

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Economic Growth, Development, and Foreign Trade. By PRANAB K. BARDHAN. New York: John Wiley & Sons, 1970. $11.95.

The title of this book might lead a delegate to the next UNCTAD conference to imagine that he might find some points in it for a speech. He would be mistaken. It is not that sort of book. It is a tight, concise work by a theorist for other theorists, the product of a young and vigorous mind inspired by Indian problems and sharpened by sojourns at both Cambridges. The book has nine chapters in two parts, the first on descriptive and the second on normative models, and an introduction in which the author assesses the current state of the literature on trade and growth and defines the scope of his own work. Among the many topics he excludes is the recent work by Vernon and others on the trade implications of R & D and the "product cycle," but in a footnote he makes the interesting observation that this approach might be formalized in terms of the Lancaster consumer-demand model as a theoretical framework.

The first chapter lays out the basic relations of the standard trade model and