

Preface

Frank Hahn has had a long and varied career, and it is not over yet. His first publication dates from 1948, so one could say that his career has intersected six decades of economics. That is a long time by anyone's reckoning, but it was an exceptionally lively period for economic theory. Hahn was active in many of the most exciting episodes. His research interests are broad, and he has made contributions to a variety of fields: monetary theory, macroeconomics, general-equilibrium theory, the economics of information, economic dynamics, and capital theory. For all these reasons, a collection of essays that attempts to honor Hahn's work and interests will necessarily be wide-ranging.

There is another reason, however, why this collection should cover such a wide range of topics. Frank Hahn has always had a keen interest in the work of other economists, especially younger theorists. A number of the contributors were encouraged by Hahn early in their careers and their contributions reflect the breadth of his interests.

The contributors to this volume include old friends, colleagues, and young theorists whom Hahn has encouraged in recent years. Twenty-four of the contributions are grouped into three parts titled *Microeconomic Foundations of Macroeconomics*, *Information and the Theory of Games*, and *Optimality and Equilibrium with Missing Markets*. In each of these broad areas, the contributions represent the diversity of research on the frontier of economic theory, as well as the diversity of Frank Hahn's research and interests. The fourth part of the volume, comprising papers by Terence Gorman, Paul Samuelson, and Partha Dasgupta, is titled *Miscellany*.

Microeconomic Foundations of Macroeconomics

At the beginning of his career, Hahn was mainly concerned with macroeconomics. His Ph.D. dissertation (published in 1972) developed a macroeconomic theory of output and employment. It was remarkable for giving a central role to the distribution of income (in this, it anticipates the Kaldor-Passinetti theory of distribution) and for incorporating a number of recent theoretical advances, such as expected-utility theory, that were quite novel at that time in the mainstream of macroeconomic theory. Bob Solow reviews this theory in his essay "Hahn on the Share of Wages in National Income." Hahn maintained his early interest throughout the rest of his career; it is exemplified by his later work on conjectural equilib-

rium (1978), an attempt to put Keynesian economics on a sound general-equilibrium footing (a typically Hahnian enterprise). He also found time to comment rather negatively on other schools of macroeconomic thought.

The first part of the volume also includes Walt Heller's "Underemployment as a Coordination Problem with Savings and Increasing Returns," which is closely related to Hahn's work on conjectural equilibrium. This paper, which is very much in the general-equilibrium tradition of which Hahn approved, deals with multiple, Pareto-ranked equilibria (a favorite Hahn theme of recent years). At the other extreme we have the information-based model of Oliver Hart and Eric Maskin in "Production Fluctuations and Fiscal Policy in an Economy with Aggregate and Idiosyncratic Shocks." Others write on savings (Starrett), unemployment (Atkinson), and wage setting (Bliss). Each of the essays has a firm microeconomic underpinning.

Information and the Theory of Games

Hahn has not yet to my knowledge published a paper on game theory, but it is neither inappropriate nor accidental that so many of the contributions to this volume deal with games, incentives, mechanism design, and the like. Hahn has been following the burgeoning game-theory literature (and commenting on it in typical Hahnian fashion) for years, and the contributors who have written on these topics are well acquainted with his views.

In the early 1960s Hahn began spending his summers in Stanford at the now-famous Institute for Mathematical Studies in the Social Sciences (IMSSS). Together with Bob Aumann and Ken Arrow, he led a series of workshops and seminars that included many of the most eminent theorists over a period of almost three decades. The IMSSS was notable for attracting the brightest young theorists, many of them just out of graduate school. (Spotting future leaders of the profession appears to have been a favorite pastime among the older members of the IMSSS.) Many of the contributors to this volume passed through that rather grueling "finishing school."

At the IMSSS, Hahn followed developments in game theory and the theory of incentives and mechanism design with interest. In the late 1970s he established his own version of the IMSSS at Cambridge University, with the help of David Newbery and Oliver Hart and with funding from the Social Science Research Council (SSRC). Among other things, the

SSRC project supported visitors to Cambridge and some young theorists who ended up staying there. Over the next ten years, David Kreps, Eric Maskin, Louis Makowski, John Geanakoplos, Heraklis Polemarchakis, Tim Kehoe, Hamid Sabourian, and Adam Brandenburger worked in Cambridge thanks to this project. Most of these contributors would have participated in another Hahnian innovation: the informal seminar dubbed the “Quaker Meeting,” so called because the participants were expected to “speak when the spirit moved them.” The extemporaneous debate that characterized this forum was exactly the sort of rough-and-tumble that Hahn loved. Some of the ideas contained in the essays in this part of the volume may well have been discussed, in embryonic form, in the Quaker Meeting.

Optimality and Equilibrium in Missing Markets

Hahn was always a practitioner and exponent of general-equilibrium theory. He made important contributions to pure general-equilibrium theory, notably his work on the stability of competitive equilibrium. But although he appreciated the esthetic and intellectual achievement of the Arrow-Debreu-McKenzie model, he was never satisfied with it. In particular, he could not accept the assumption of a complete set of contingent markets; he always strove to get beyond it in his own work.

In the late 1960s and the early 1970s, Hahn began to work on the problem of “missing markets.” This was a natural extension of his earlier studies in monetary economics. From the first, however, he realized that the issue of missing markets had a broader significance, and he sometimes seemed to regard it as the key to understanding macroeconomics. His major contribution was his analysis of transaction costs and the study of the welfare properties of equilibria when markets are incomplete. He argued convincingly (1971a, 1973) that the welfare properties of the Arrow-Debreu-McKenzie model are lost when markets are incomplete. Subsequent work by Grossman, Hart, and others confirmed his position.

Several of the essays in the third part of this volume deal with welfare issues. Peter Hammond writes on “The Impossibility of Perfect Capital Markets.” The paper by Tim Kehoe, David Levine, and Mike Woodford, “The Optimum Quantity of Money Revisited,” recalls Hahn’s famous review of Friedman’s *Optimum Quantity of Money* (Hahn 1971b). Diamond and Mirrlees write on optimal taxation with incomplete markets.

Hahn is known above all for his contributions to monetary theory. As he never tired of saying, there is no role for money in the Arrow-Debreu model. Later research suggests this may have been an overstatement, but Hahn was substantially correct, and his own work on existence of monetary equilibrium (1965) was a theoretical milestone. Pradeep Dubey and John Geanakoplos explore a related question in their essay, “The Value of Money in a Finite-Horizon Economy: A Role for Banks.”

Several of the papers treat issues of indeterminacy of equilibrium. Hahn was a pioneer in this area. His work on growth models with heterogeneous capital goods (1968) established the indeterminacy of dynamic equilibrium long before it became a fashionable topic. In recent years, he has enjoyed pointing out that simple policy prescriptions based on looking at a single equilibrium are useless if there are many equilibria. The essay by Pierre-André Chiappori and Roger Guesnerie, “The Lucas Equation, Indeterminacy, and Non-Neutrality: An Example,” should be a favorite of Hahn for this reason. Another essay in this category is Andreu Mas-Colell’s “Three Observations on Sunspots and Asset Redundancy.”

Sometimes Hahn has gone so far as to suggest that indeterminacy provides a role for government. This is something many economists would find debatable.

The Uses of Economic Theory

The papers in parts I–III reflect Hahn’s influence as an active researcher and as a “patron” of the young. But there is another important respect in which these essays reflect his influence. Hahn is a believer in the practical value of economic theory. From my days as a graduate student I remember him stressing “the difference between thinking about a problem and not thinking about it.” That has always seemed to me a good justification of economic theory. But this is not a defense of ivory-tower thinking. In the last part of the book, for example, Dasgupta stresses the instrumental (practical) virtues of freedom and Gorman discusses the education of civil servants. What distinguishes Hahn’s work and many of the essays in this book is that, even in the most abstract pieces, the motivation often comes from practical concerns about unemployment, savings and investment, the stability of markets, poverty, and so forth. Rigorous thinking need not be irrelevant.

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References

- Hahn, F. 1965. "On some problems of proving the existence of an equilibrium in a monetary economy." in *The Theory of Interest Rates*, ed. F. Hahn and F. Brechling. Macmillan.
- Hahn, F. 1968. "On warranted growth paths." *Review of Economic Studies* 35: 175–184.
- Hahn, F. 1971a. "Equilibrium with transaction costs." *Econometrica* 39: 417–439.
- Hahn, F. 1971b. "Professor Friedman's views on money." *Economica* 38: 61–80.
- Hahn, F. 1972. *The Share of Wages in National Income: An Enquiry into the Theory of Distribution*. Weidenfeld & Nicholson.
- Hahn, F. 1973. "On transaction costs, inessential sequence economies and money." *Review of Economic Studies* 40: 449–461.
- Hahn, F. 1978. "On non-Walrasian equilibria." *Review of Economic Studies* 45: 1–18.