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(corporate or governmental) organizations cannot be explained as a species of individualized decision. The large corporate organization, moreover, is embedded in a particular industrial "community," which is to say that it is itself a component in an even larger and more complex organization. Some of us have tried to analyze the organizational sector in these terms, but what we haven't done (and here is where Cotta's idea comes in) is to develop an analytic frame that others can work with, so that cumulatively, as a discipline, our observations can be organized and our understanding of this sector at the heart of the modern economy, can be deepened. What Alain Cotta proposes might constitute such a framework.

Consider, he suggests, the organizational components of an industrial community related as in a matrix, indeed as matrices for each level of cooperative or competitive interaction. Company *A* raises price; companies *C, G, E*, follow *A*; companies *B, F, D* follow company *G*; companies *H* and *T*, resist and sometimes reverse the price tide. Can such a pattern be repeatedly observed (with particular entities playing an identifiable role) so their decisions and actions can be understood as inputs to the policy and behavior of others? And not only for price change, but for, say, cost saving innovation, style changes, wage bargains, investment decision, and any and all of the other dimensions of competitive and cooperative behavior? And if patterns are to be observed, how do they change through time? How do they compare industrial community to industrial community? And how is that which has thus been observed, to be explained. Cotta alas does not have the taste for the empirical digging that his approach demands: its value is specifically that it lays out a framework for the systematic observation of organizational behavior. He prefers armchair speculation; with a display of mathematical virtuosity he explores the formal qualities of his matrices. The potential values of his apparatus remain as yet quite unexploited.

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Optimal economic growth: Shifting finite versus infinite time horizon. By M. INAGAKI. Contributions to Economic Analysis, No. 63.

Amsterdam and London: North-Holland Publishing Company, 1970. Pp. xvi, 196. \$11.00.

Frank Ramsey's "A Mathematical Theory of Saving" (*Economic Journal*, 1928) is the seminal study in what is today known as the theory of consumption-optimal economic growth. During the 1940s and '50s the attention of mathematical economists turned to optimization over time in pure production models, resulting in the turnpike theorems of von Neumann, DOSSO (Dorfman-Samuelson-Solow), R. Radner, H. Furuya and K. Inada, and others. Within the last decade, we have seen a tremendous reawakening of interest in the Ramsey problem. T. C. Koopmans, H. Uzawa, D. Cass, P. Samuelson, and many other names are associated with the resurgence of interest in the basic theory of intertemporal allocation.

Professor Inagaki was an early contributor to our understanding of the Ramsey problem. His investigations into optimal growth under exogenous technological change are especially worthy of the attention of economic theorists. This work may have received less attention than it deserves because of its limited accessibility; it was available only in mimeographed form from the Netherlands Economic Institute Division of Balanced Economic Growth. We need no longer depend on the mimeograph machine; Part II of Inagaki's book is made up of a selection of five of these earlier papers.

It is Part I, however, that sets the tone of the monograph. An alternative is sought to Ramsey's principle, which is referred to by the author as Utility Maximization over Infinite Time, or UMIT. Inagaki's alternative is a solution to a group decision problem of successive governments. Although the author is careful to stress that his approach need not lead to a unique ethical principle, he seems to place particular emphasis on the strategy which he calls Marginal Utility Equilibrium over Finite Time, or MUEFT.

Three arguments against Ramsey's UMIT principle are offered. First, under technological progress, existence of a UMIT-optimal policy either requires a large positive discount rate or satiation in consumption and/or production. Time discounting is, of course, a discrimination against individuals based on their "calendar

time," long recognized as ethically unsound. In fact, nondiscrimination suggests a discount rate equal to the negative of the population growth rate—lessening the "likelihood" of existence of an optimal policy. Along the way Inagaki suggests the "Principle of Minimum Impatience." It does not provide a solution, since no such minimum discount rate exists (although there is a greatest lower bound), and it possesses no compelling ethical content.

The second objection is that the UMIT principle could prescribe saving rates that are unenforceable in practice. It is at this point that the argument begins to elude me. Certainly, there are severe limits to policy in any real-life economy. These behavioral and institutional constraints should be considered in the optimal growth exercise, but as constraints, not as ethical principles. Inagaki also argues that the Ramsey principle might be unfair, calling for the highest relative sacrifices from the poorest generations, but surely this must be a reflection of the chosen curvature of the instantaneous utility function.

The author's third and most fundamental objection is that the Ramsey approach overlooks the fact that society is composed of overlapping generations with limited life spans and conflicting allocational interests. Inagaki introduces the concept of the instantaneous government (IG), which co-controls the level of saving at a single moment t , but has preferences for consumption streams defined over the period $(t, t + w)$. Each IG is in conflict with a set of other IGs. National allegiance (rules of ethically acceptable behavior?) limit the choice of the IGs. A particular form of national allegiance leads to the MUEFT principle.

There can be no disagreement with Inagaki's first objection, *i.e.*, in important cases the Ramsey problem has no solution. An ethical principle that does not provide answers to ethical questions is incomplete. Recognition of this incompleteness has led to the proposal of principles which choose optimal paths for cases in which UMIT paths do not exist. One instance is Christian Weizsäcker's overtaking principle. While the Weizsäcker criterion gives the same answer as UMIT (when UMIT gives an answer) and provides solutions for additional cases, it does not provide solutions for all tech-

nological situations. (It should also be noted that the overtaking criterion is not blind to calendar time.)

The author's second and third objections are not at all clear to me. I admit to the existence of generational conflict (at least among "generations" treading the earth at the same time). Intergenerational conflict seems to be the essence of the game-equilibrium growth analysis of Phelps and Pollak, and Meade before them. These are interesting descriptive models of growth. The Ramsey problem, on the other hand, is an exercise in applied ethics. The question is asked: Which is the ethically most preferred consumption program? The Inagaki model is a curious hybrid. "National allegiance" leads to a set of rules which constrain each IG in the pursuit of pure selfishness. It would seem to me that these rules of national allegiance should be derived from ethical first principles. If I am right in this judgment, contrary to his claim, Inagaki has not provided an alternative ethical principle to UMIT, but has developed some interesting ideas applicable to the descriptive theory of rolling plans (*a la* Steven Goldman) based on constrained selfishness of successive generations or the governments representing them.

A useful bibliography on optimal growth theory is provided.

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On incomes policy. Papers and proceedings from a conference in honour of Erik Lundberg. Stockholm: Studieförbundet Näringsliv och Samhälle (The Industrial Council for Social and Economic Studies), 1969. Pp. 275. \$5.00.

In 1967, Erik Lundberg was 60 years old. Instead of a *Festschrift* to honor the occasion, the Swedish Industrial Council for Social and Economic Studies, with which Lundberg has long been associated, decided to give him a birthday party. It was an unusual party; some fifty distinguished economists, from Western Europe and the United States, many with their wives, assembled for several days of fun and games in Uricehamn, a small secluded town in southwestern Sweden. A portion of their time was devoted to discussion: in this age of infla-