Introduction to general equilibrium

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Abstract

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1. A short and incomplete perspective

A goal in this symposium is to offer a snapshot of some of the best research currently going on in the theory of general equilibrium. The most active research themes in this field can be traced back to a rather small number of influential sources. The following is neither a detailed listing nor an exhaustive account of the research in general equilibrium theory during the past one hundred years, a goal that would be far beyond the scope of this short essay. The role of our short and necessarily incomplete historical references is to offer some perspective on the research papers in the symposium. The book and papers we have highlighted are: (1) The 1951 articles of Arrow [2] and Debreu [18], in which equilibrium is shown to be Pareto efficient – the first theorem of welfare economics; (2) The 1954 articles by Arrow and Debreu [5] and McKenzie [32], where the existence of an equilibrium is proved by a fixed-point argument; (3) Debreu's monograph [19], which applies to the general equilibrium model of Walras [37] the axiomatic

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approach advocated in the treatise of Nicolas Bourbaki [13] – see in particular the part on "Mode d'emploi de ce traité;" (4) The formulation in Arrow [3,4] of a two-period model with uncertainty in the second period with the explicit introduction of assets to enable the transfer of wealth through time and states of nature. Arrow shows the equivalence between the two-period model with complete securities and spot commodity markets and the contingent-goods model in Chapter 7 of Debreu [19]. (5) The overlapping-generations paper of Samuelson [33] with the discovery that existence of equilibrium with a strictly positive value of money and even its efficiency are not incompatible with monetary policies that are not balanced; (6) The infinite horizon paper by Malinvaud [31] that contains the observation that the first theorem of welfare economics does not hold true in infinite horizon models and Shell [34] who establishes that the sole source of inefficiency in the overlapping-generations model of Samuelson [33] is the open time-horizon. Malinvaud [31] also contains the proof that prices tending to zero at infinity is a sufficient condition for the efficiency of equilibrium allocations, a result subsequently improved by Cass [14] and by Balasko and Shell [11] into a complete characterization of efficiency in growth models and overlapping-generations models respectively; (7) The smooth economies paper of Debreu [20] showing that generically there are only a finite number of locally unique equilibria around each of which differentiable comparative statics is well-defined; (8) The Cass and Shell [17] sunspot paper that contains the first formulation of a sunspot model and the proof of the existence of sunspot equilibria under restricted market participation. (9) The existence and indeterminacy of equilibrium motivated by the analysis of the various sources of sunspot equilibrium established for a two period model with nominal and incomplete asset payoffs by Cass [15,16], the working paper versions of these articles having been published almost simultaneously in 1984. The existence and indeterminacy properties were extended to the general case by Balasko and Cass [9] and Geanakoplos and Mas-Colell [27]; (10) The paper by Geanakoplos and Polemarchakis [28] showing that, for generic economies with at least two agents and incomplete asset markets, equilibrium is not only Pareto inefficient but also constrained Pareto inefficient; (11) The articles by Dubey, Geanakoplos and Shubik [22] (circulated in 1988) and by Geanakoplos [25] and Geanakoplos and Zame [29] that introduced default and punishment and default and collateral respectively into the general equilibrium model with incomplete asset markets.

Cross-fertilization between these different lines of research has been particularly fruitful. There is rarely a theory paper nowadays that does not combine at least two of the above research lines. It is hardly surprising to see that the rich literature on default, incomplete markets and efficiency is represented in the current symposium by no less than three papers, namely the papers by Araujo, Kubler and Schommer [1], by Fostel and Geanakoplos [24] and by Bottazi, Luque and Pascoa [12]. Henriksen and Spear [30] work with incomplete markets and efficiency, Balasko [6] deals with sunspot equilibria and regular economies, and Villanacci and Zenginobuz [36] deal with existence and efficiency of equilibrium.

2. Existence and efficiency

Villanacci and Zenginobuz [36] is a direct descendant of the Arrow–Debreu and McKenzie existence papers. It deals with a general equilibrium model with one public good and a collection of private goods. The public good is produced by a firm that uses the private goods as inputs. Villanacci and Zenginobuz use the concept of subscription equilibrium introduced for that setup by Malinvaud. Previous results developed in simple versions of the model have suggested that a certain neutrality property would be satisfied by subscription equilibria in these simple models. Roughly speaking, the level of public good provision at equilibrium does not depend on