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Macroeconomic Policy Games

With 11 Figures

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Introduction

In the traditional view of macroeconomics and the analysis of economic policy the agents, which could be individuals as well as groups or institutions, are treated as if they were acting completely passively. They take the economic and political environment as given and unchangeable by their own actions and behavior. Therefore they are assumed to maximize their utility given all the parameters, relevant for their decisionmaking. If changes in the environment occur the agents are reacting like a well programmed machine, which does not think about the sources, meaning and possible background of these changes. Hence this view of economically active agents also neglects the possibility of anticipating behavior, in a strategic sense. The economic policy makers, like the government or the central bank, are viewed as a benevolent dictator neglecting possible inter- and intrainstitutional conflicts. Furthermore nothing is said about the formation process of unions and lobbies or about which institutional settings will be conducive to such formation processes. In practice, however, the issues mentioned above play a crucial role and a theory which neglects them will at best be able to make statements of very limited nature and is therefore at least incomplete. In general, however, such a theory is bound to yield misleading prescriptions. Therefore it is not surprising that game theory as a theory of strategic behavior becomes more and more important in macroeconomic theory. In macroeconomics and economic policy the reaction of other economic agents can typically not be ignored when changes in economic policy occur. A central bank e.g. has on one hand to analyse if it has the power and instruments to influence the policy of other central banks and how this other central banks will react, if they react at all. On the other hand it has also to analyse how the economic agents in the own country will react to the changed policy. How will it influence the bargaining activities and outcomes between workers and firms at a micro as well as at a macro level. Another question is which economic policy is able to create incentives that lead to (Pareto) optimal solutions? What to do if such solutions do not exist? Are there ways to reach second best solutions?

One further important problem is the credibility of economic policy. An interesting example is the breakdown of the so called Phillipscurve. If the private sector expects that the government attempts to exploit an apparent short-run tradeoff between unemployment and inflation, then the possible real effects of an expansive monetary policy will be nullified. It is also of importance how the other economic agents are organized. It should be clear that the same economic policy will lead to different outcomes if the economy is highly unionized or not, or if there are closed shops or a central union which is incorporated in a social partnership. For the policy maker it will also be of importance to analyse if it will be better to do a “surprising” policy or if she should build up some kind of reputation. Of further interest in the analysis of economic policy is what are the strategy spaces of the economic agents. Are there institutions which can influence these spaces in a favorable way for reaching better outcomes in a welfare sense? Are there ways of distributing income which is then less conflicting with reallocation targets than the traditional ones? The answer to these and other questions important for economic analysis is one step further to a positive theory of economic policy. This positive analysis in turn leads to normative suggestions about how to modify the incentives and constraints that define the policy problem.

The authors of these conference volume, which are all familiar with macroeconomics as well as with game theory, are trying to answer some of these questions.

Erwin Amann and Klaus Ritzberger study reputational equilibria in a macro-economic game with infinite action spaces and a continuum of types. They generalize the “Backus and Driffill Reputation Model” and analyse a macroeconomic game between a wage setting trade union and a central bank controlling money supply under uncertainty about the central bank’s type. The authors drop the assumption of a finite action space as well as they allow for a continuum of types. They show the existence of sequential equilibrium and find a sufficient condition for global pooling. Furthermore since sequential equilibrium cannot rule out an increase of expected inflation they give a sufficient condition which should be the result of any sensible sequential equilibrium refinement to ensure lower expected inflation by a reputational effect.

Erwin Amann and Georg Winckler analyse the interaction between social partnership and exchange rate policy within an open economy which is thought of containing many firms, one in the sheltered sector and the others in the exposed sector, and one representative household. They specify a bargaining game between the social partners in which the exchange rate is an important parameter. In the model they evaluate the advantages and disadvantages of a flexible exchange rate policy in contrast to a fixed exchange rate policy and

conclude that the question of introducing one or the other policy hinges to a large extent on the credibility of the central bank.

Engelbert J. Dockner and Reinhard Neck examine the problem of policy coordination on the national and the international level, using a two-player model of differential game theory. They compare non-cooperative policy making with the set of cooperative Pareto-optimal solutions. Within the noncooperative approach they analyse the no-memory feedback Nash equilibrium solution as well as solutions in a framework where memory-strategies are allowed. Considering memoryless feedback solutions the authors show that the players are better off if they collude, since noncooperative memoryless behavior generates inefficiencies. On the other hand they demonstrate that if memory is allowed there exist equilibrium strategies which lead to Pareto-optimal solutions.

Peter Flaschel integrates the problems of labour market segmentation into the growth cycle of R. M. Goodwin. He assumes that there are two types of labour characterized by different productivities per “workweek” and analyses what new aspects come about if the more productive group in fact cooperates with “capital” in contrast to the case of solidarity between the two groups of workers. He finds that the more productive group will gain from such cooperation whereas the second group will lose, and that this cooperation will contribute to the stabilizing features of Goodwin’s growth cycle model. The author concludes that the problem of integrating questions of income distribution into the macroeconomic analysis of economic evolution has still to be characterized as a very underdeveloped topic and much further research, especially with the help of the tools provided by game theory, has to be done.

Gerhard Hanappi discusses the perspectives of gaming. He argues that since “gaming” is undoubtedly a very specific application of modern computer technology which analyses economic questions in a very particular way, the answer to the question “What is the use of such experiments?” will thus be a good starting point for giving structure to the objectives of “gaming”. He discusses some experiments with micro- and macro-games starting with a business game developed by Martin Shubik as well as possible research strategies in the future, especially concerning gaming in a macroeconomic context and concludes that gaming as a technique for the goal driven application of economic theory is its perspective.

Gerhard Schwödiauer investigates a modified overlapping-generations model – with 2-period life-cycles for individuals and monopolistic competition in the goods market – in which the positive value of money is secured by a cash-in-advance constraint on individual transactions. He demonstrates that monetary policy and lump-sum taxes alone cannot support a stationary perfect-foresight equilibrium that is Pareto-optimal. The author also investigates a variant of

the model. In this variant there is a sequence of governments which are only concerned about the expected welfare of individuals which are alive at that time in which the government is in office. He shows that due to the finiteness of individual life expectancies a Pareto-optimal stationary perfect-foresight equilibrium cannot be supported by a non-cooperative policy equilibrium.

We hope that this conference volume will provide some insights and a great deal of suggestions for the future development of macroeconomics and economic policy on the basis of game theory.