Money, Trust and Equilibrium Points in Games in Extensive Form

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1. On Static Models

The major part of microeconomic theory is static. This includes the elegant theorizing concerning the existence of a price system under relatively general conditions. There is a good reason for emphasis to have been placed on a static theory. It is far simpler than any dynamic theory promises to be.

The applications of the theory of games to the study economic phenomena have been no exception to the rule calling for emphasis to be laid on statics. In the start of their book von Neumann and Morgenstern lay stress on the reasons for starting with a static theory [17].

Unfortunately an understanding of money and financial institutions, even at a relatively elementary level calls for the development of some dynamics. This is certainly indicated when one contrasts macroeconomic with microeconomic theorizing. It is argued here that a dynamic component needs to be added to microeconomic theorizing if we wish to progress in any depth in the study of money and financial institutions.

In this and other papers use is made of a game theoretic formulation of many of the basic features of economies with money and financial institutions. This formulation is particularly good in exposing the importance of strategic considerations, the role of trust, the role of information and the critical importance of special rules of the game concerning the enforcement of contract.

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For those who are not acquainted with the basic concepts of the theory of games the following two sections will be somewhat elliptical, but they are reasonably self-contained. The basic background called for is given elsewhere [6].

1.1 Descriptions of an Economy

There are three completely different static descriptions of a game all of which are of direct applicability to an economy. They are:

(1) the extensive form,
(2) the normalized or strategic form, and
(3) the characteristic function or coalitional form.

A simple and relevant example is provided to illustrate all three of these descriptions. Consider two retailing firms in competition during one market period. We assume that during this period they each have time for two moves. These moves are respectively to buy from the wholesalers (or factories), i.e. to stock up and then to name a retail price at which each will sell to the customers.

Obviously the one period market described above is part of a continuous process. There are usually many market periods before the death or exit of a firm. Furthermore the move pattern is by no means as regular as might be implied by the description above. There are also many other moves such as the arranging of bank credit, the paying of wages and dividends, the setting of discounts and so forth.

A good microeconomist, after general results, may be inclined to adopt the attitude that much of the above represents fine and unnecessary institutional detail. Frequently he may be right. However this depends explicitly upon the question to be answered. In particular if he is interested in oligopoly theory or in finance then implicitly or explicitly he must be interested in dynamics. In these instances, that which might otherwise be regarded as “mere institutional fine detail” becomes of critical importance to the formulation of a model suitable for analysis.

Returning to our example with two firms each with two moves; in order to fully specify the model we must state the order of the moves and the information pattern. For simplicity we assume that the two firms each order stock simultaneously, they then name price simultaneously.

After the firms have ordered stock, but before they name prices do the firms find out what each has done? The pattern of infor-