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Macroeconomic fluctuations and indidual behaviour; the implications of real and normal inertia.

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8.   Summary and Conclusion

8.1   Summary

This study is an attempt to provide some insight into the characteristics of economic processes. In our view, an analysis of economic processes has to consider the following propositions. In the first place, adjustment processes themselves, which lead to the establishment of different equilibria need further consideration. In the second place and related to the first observation, the heterogeneity of agents has to be considered more explicitly. With respect to the first proposition it can be argued that the assumption of perfect coordination is very restrictive, since it neglects the implications of trade as a fundamental manifestation of the workings of a market economy. However, both new classical as well as a large number of new Keynesian theories take the establishment of equilibrium outcomes of the coordination process for granted. Primarily the characteristics of terminal states are analyzed, whereas the question how these states come about is not considered. In this thesis a similar approach is followed in chapter 5. In our opinion this approach is allowed in case adjustment processes do not take much time or are of no interest to the problem at hand. Also as a first orientation of a particular problem this method may be appropriate. In other cases an explicit analysis of adjustment processes is required, for instance, along the lines of a sequential–analytical approach as in chapters 6 and 7. With respect to the second proposition it can be observed that heterogeneity of agents has important implications for the determination of market prices and for the assumed interdependence between agents or sectors in the economy. For the sake of simplicity we confine our analysis to the impact of heterogeneity among agents on the determination of commodity prices. To that purpose kinked perceived demand and supply curves are introduced in the commodity market [Stiglitz (1987)]. In the literature (see chapters 4 and 5), kinked demand curves have served as an analytical device that enabled the explanation of commodity price rigidity. In chapters 6 and 7 we analyze the implications of kinked demand and supply curves in a more dynamic environment.

The first four chapters of the thesis deal with the abovementioned problems by means of a discussion of the relevant literature. In chapter 2 we consider flexprice models of economic fluctuations. A major characteristic of this approach is the assumption of perfect coordination.

Deviations from the natural levels of output and employment are explained by the introduction of imperfect information. However, the explanation of persistent fluctuations in monetary business cycle models is not very convincing. Alternatively, in the context of real business cycle models persistent fluctuations in economic activity arise as an equilibrium response to stochastic fluctuations in technology and preference orderings. The real business cycle approach can be criticized on theoretical and empirical grounds. Representative agent models do not leave scope for the presence of externalities. On the other hand, the successful coordination of individual activities is assumed rather than explained. Furthermore, if the process of obtaining knowledge is monotonic or if technology shocks are not economy-wide, the rationale for fluctuations disappears altogether. Hence, the claim that fluctuations in output and employment can be analyzed in the context of a perfectly competitive system cannot be confirmed.

In chapters 3 and 4 analytical approaches that abandon the assumption of perfect coordination are discussed. In chapter 3 we concluded from an analysis of fixprice models that they do not provide a convincing explanation of fluctuations in output and employment. The following arguments apply. In the first place, it is not explained why agents refrain from price adjustments to relieve perceived constraints [Arrow (1959)]. In the second place, it can be argued that Pareto improving trades are prohibited because agents only consider the impact of a perceived constraint in a particular market on their own behaviour in other markets. However, in a situation of general excess supply, the activities of one agent may have a non-negligible impact on the behaviour of other agents. Yet, strategic behaviour is not considered in fixprice models. The Walrasian auctioneer who guarantees the successful coordination (and cooperation) of individual activities (perfect information) is (implicitly) reintroduced into fixprice theory. As a result, quantity-constrained equilibria can only follow from *ad hoc* restrictions imposed on the process of trade and information dispersion.

In chapter 4 new Keynesian explanations of price and wage rigidities and theories of coordination failures and indeterminacies are discussed. New Keynesian models are characterized by absence of the Walrasian auctioneer, which implies the introduction of incomplete and asymmetric information in the economy. As a result, individual activities may not be socially efficient and the economy may get *stuck* in an equilibrium with a low level

of economic activity. Prices do not reveal all available information about relative scarcities and may signal additional information beside scarcity relationships at the same time, as in the theory of implicit contracts and efficiency wages. However, prices are only one element in the theory of coordination failures. Coordination failures may arise in the context of a number of different models as is illustrated in chapter 4. It can be observed that the new Keynesian literature does not take for granted that the exchange process coordinates economic activities in the best possible way. On the other hand, the exchange process itself is not really analyzed. Only the characteristics of socially inefficient equilibrium outcomes of the exchange process are emphasized. The question how a (non–cooperative Nash) equilibrium may come about is left unanswered. Obviously, this question calls for a dynamic approach. In this respect, the analysis in chapters 6 and 7 can be considered as an illustration of the latter.

Preceding the dynamic analysis of the last two chapters a new Keynesian static macroeconomic model is developed in chapter 5 , which may explain both real and nominal rigidities and inefficiently low equilibrium levels of economic activity. Rigidity in real wages is explained by the efficiency wage theory. Rigidity in real commodity prices may originate from the existence of positive search costs, which give rise to a kinked demand curve. In case the economy is characterized by real (relative) wage stickiness, flexible (relative) prices and flexible nominal wages, it is concluded that real aggregate demand cannot be affected by demand management. In particular a change in the level of money supply does not influence the level of economic activity. An increase in the level of money supply will only result in an increase in the general price level. On the other hand, if the economy is characterized by real price and real wage rigidity as an optimal response to a change in demand conditions a different picture emerges. Aggregate demand shocks directly influence the level of economic activity. Real economic activity can be stimulated by an increase in real government expenditure. Monetary policy and money–financed fiscal policy can be effective in a situation where firms are Nash–competitors and commodity markets are characterized by imperfect information and small positive search costs.

The approach followed in chapter 5 provides a straightforward suggestion for subsequent research. Since the model is static, the characteristics of adjustment processes cannot be analyzed. To that purpose, a dynamic model is developed in chapter 6. Time is divided in arbitrary small discrete periods.

In this way and since *current – period* expectations precede and are independent of actual events in the current period, the irreversibility of economic processes is incorporated in the model. At the same time a more explicit framework for the analysis of activities that move economic processes is developed. The model has the following additional characteristics. Agents' real and financial decisions are intertwined and taken at the beginning of every unit–period. Financial markets clear. Production takes one period and all commodities are stored. Sales are only made out of stock. The determination of commodity prices is analogous to Hahn (1978) and incorporates the implications of asymmetric information [Stiglitz (1987)]. The adjustment of wages in between periods rests upon the Phillips curve, whereas expectations are adaptive.

Despite the introduction of the last two simplifications, the model cannot be solved analytically. The characteristics of the model have been studied by means of a number of simulation experiments, which are reported in chapter 7. The analysis of the simulation results is performed with the following aims in mind. In the first place, the simulations are an attempt to provide some insight into the features of economic processes in a setting where the existence of perfect coordination is not assumed beforehand. In the second place, the implications of heterogeneity among agents are considered in as far as they may affect the formation of commodity prices. In the third place, it is analyzed to what extent storage possibilities may be regarded as an additional source of price rigidity, on the one hand, and as a buffer between demand and production, on the other hand. The analysis is concentrated on the developments in the real sector in the economy and particularly on the developments in the commodity market, since the model does not permit a detailed analysis of financial behaviour.

From the simulation experiments the following conclusions may be drawn. In the first place, the influence of inventory formation on price behaviour is in line with observations in the relevant literature. Commodity prices display downward rigidity, while inventories absorb fluctuations in aggregate demand. In the second place, price–setting behaviour of firms is dominated by future price expectations. This implies that prices may rise in periods of excess commodity supply in case this situation is short and preceded by a relatively long period of excess commodity demand. In somewhat more prolonged periods of excess supply prices are rigid (corrected for expected inflation), whereas they eventually decline in period of sustained excess supply as a result of a downward shift of expected future commodity

prices. In situations of excess demand commodity prices rise. Furthermore, households consider the implications of excess demand in advance, since already at the beginning of this regime they *a priori* decide to reduce intended consumption given the level of wealth. In the third place, it can be observed that policy changes have a considerable impact on the level of aggregate demand. The effect on the supply side of the economy is smaller, because of offsetting developments in commodity prices. In the fourth place, it can be concluded that the simulation results do not indicate a tendency toward a situation of rest. In particular the behaviour of the private sector does not show a tendency to a situation of equilibrium growth.

It should be emphasized that the sequential–analytical procedure we have followed has some drawbacks. The most important argument against our approach is that it does not permit any observations about the establishment or the characteristics of some terminal (steady) state in the context of the model. The implication of our rejection of the temporary equilibrium method is that we cannot determine an equilibrium position or time path at all. The observations are always conditional on the set of parameter values used. Simulation experiments only illustrate possible time patterns that can be generated within the context of the model. We will not attempt to generalize the results. On the other hand, we do not regard the temporary equilibrium assumption as a useful starting device for the analysis of dynamic processes, since it assumes what it has to explain, the establishment of an equilibrium position. Seen from that perspective, the approach followed here has to be preferred.

8.2   Conclusion

In our opinion, the last lines of the previous section reveal a fundamental problem of macroeconomic theory. On the one hand, mainstream macroeconomic literature can be criticized for the neglect of an essential feature of macroeconomics, the coordination issue. On the other hand, the analysis of chapters 6 and 7 illustrates the inability to generalize results that are obtained from an approach that focused more explicitly on this issue. The question arises what direction subsequent research should take.

In our view macroeconomic theory has to deal with problems of coordination. The mere assumption that coordination is perfect, implies a denial of this essential feature of macroeconomics. For that reason it can