THE OPTIMAL USE OF INFORMATION AND THE EFFECTIVENESS OF MONETARY POLICY

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Zusammenfassung

In der neuen Literatur über die Unwirksamkeit einer systematischen Geldpolitik wird vorausgesetzt, daß die ökonomischen Akteure alle ihnen zur Verfügung stehenden Informationen für ihre Entscheidungen verwerten. In der vorliegenden Arbeit werden eine Reihe von Umständen beschrieben, in denen es für Akteure keinen Anreiz gibt, sich so zu verhalten. Insbesondere haben Oligopolisten keinen Anreiz, alle ihnen zur Verfügung stehenden Informationen zu verwenden, wenn sie glauben, daß die Durchführung einer systematischen Geldpolitik zur Beeinflussung realer Variabler für alle gemeinsam günstig ist. Diese Akteure würden dann die Wirksamkeit der systematischen Geldpolitik sichern, in dem sie ihre Erwartungen aufgrund einer eingeschränkten Informationsmenge bilden. Ihr Erwartungsbildungsmechanismus hat keinerlei Auswirkungen auf reale Größen, vorausgesetzt, daß dieser Mechanismus systematisch ist (d.h. vorhersehbar für die geldpolitischen Autoritäten).

Summary

The recent literature on the ineffectiveness of systematic monetary policy assumes that economic agents always use all the information available to them in formulating their economic decisions. This paper considers a set of circumstances in which agents have no incentive to do so. In particular, oligopolists may have no incentive to use all the information in their information sets whenever they believe that the implementation of systematic monetary policy (to influence real variables) would be collectively beneficial to them. These agents may then ensure the effectiveness of systematic monetary policy by devising their expectations on the basis of a restricted information set. Their expectations-generating mechanism has no effect on real economic variables, provided that this mechanism is systematic (i.e. predictable by the monetary authority).

Do private economic agents always have an incentive to use all the information available to them in formulating their economic decisions? In the recent literature on monetary policy under rational expectations it is implicitly assumed that agents do indeed have such an incentive. Thus, if all the existing economic data is available to the monetary authority and the public at the same time, then the public is assumed to figure out the structure of the economy and the authority's systematic policy rules. Consequently, systematic monetary policy is ineffective with regard to real economic variables.

This paper considers a set of economic circumstances under which private agents have no incentive to use all the available information. The monetary authority, however, does have this incentive and thus it has an informational advantage over the public. On account of this advantage, systematic monetary policy is able to influence real variables such as production and employment.

At the outset, the meaning of "available information" in this context must be clarified. We are <u>not</u> concerned with information which private agents could obtain only at a cost. The argument for the effectiveness of systematic monetary policy under costly information is well known. If the costs of acquiring information are significantly lower for the monetary authority than for private agents, then the monetary authority may be expected to learn of economic changes more quickly than the private agents. If the authority does

not share its superior information with the public (due to, say, the costs of information dissemination), then the authority has an informational advantage which provides scope for systematic monetary policy. (See, for example, Cyert and De Groot (1974), De Canio (1979), Friedman (1979), Santomero and Seater (1978), Shiller (1976) and Taylor (1975)). Under these circumstances, costs of information acquisition rob private agents of the incentive to eliminate the authority's informational advantage.

A different approach to the effectiveness of systematic monetary policy is pursued here. "Available information" here denotes information of which economic agents are currently aware, i.e. information contained in their information sets. We assume that the monetary authority's information set is the same as that of private agents. It will be argued that private agents in an oligopolistic (or oligopsonistic) setting may have no incentive to use all their information whenever they believe that the authority's use of systematic monetary policy to influence real variables would be collectively beneficial to them.

The mainstream literature on monetary policy under rational expectations does not consider the possibility that systematic monetary policy may be beneficial. Instead, it has been argued that such policy is either useless or harmful. According to the well-known policy ineffectiveness proposition, if (a) the natural rate hypotheses holds (whereby production and employment are functions of errors in price expectations), (b) economic agents have rational expectations, (c) the monetary authority has no informational advantage over the public, then

systematic monetary policy is ineffective with regard to real economic variables.[1] In this sense, the policy is useless.

On the other hand, if the monetary authority has an informational advantage, then it can allow the money supply to react to events which the public can neither recognise nor predict. In this manner, the authority can induce the public to make expectational errors and thereby production and employment can be manipulated in accordance with the authority's policy objectives.

However, it has been argued that if the costs of information dissemination and acquisition are negligible, then such manipulatio of real variables is not advisable. As an alternative to activist policy, the monetary authority could make its superior information available to the public. In turn, the public would automatically choose levels of economic activity appropriate to its expanded information set. It would be impossible - so the argument runs - for the monetary authority to find a more desirable outcome. Systematic monetary policy, based on differential access to information, could achieve a different outcome only by tricking people into making decisions they would have considered sub-optimal in the light of the monetary authority's information set. In a democratic society it is considered undesirable to use a policy which induces people to act in ways they would prefer to avoid. In this sense, systematic monetary policy may be harmful.

This standard case against activist policy rests on two significant assumptions: (1) the socially optimal level of economic activity occurs at the economy's full information position and (2) the greater the information set available to the public, the greater the social welfare generated by the public's free-market activity.

The first assumption breaks down in the presence of externalities. When private costs and benefits are not equal to their social counterparts, the free-market mechanism generates a socially suboptimal level of economic activity. In that event, it is no longer desirable for the policy maker to steer the economy toward the full-information general equilibrium. Economic actors then have a collective interest to avoid the levels of, say, production and employment which emerge from their decentralized, free-market decision-making processes.

Consider an oligopolistic industry whose sellers realise that their collective activity affects real economic variables which the monetary authority aims to control. Suppose that these oligopolists believe that their collective objectives could be met more fully if the monetary authority succeeded in achieving its policy goals than if laissez faire were allowed to prevail. The externalities above might explain their need for government intervention. Clearly, then, these agents collectively do not wish monetary policy to be ineffective.

Now assume that the conventional prerequisites for the policy-ineffectiveness proposition are satisfied, i.e. the natural rate and rational expectations hypotheses hold, all markets clear, and the monetary authroity makes all its information available to the private sector. Under these circumstances the oligopolists realise that if they used all the information available to them, systematic monetary policy would be impotent.In order to enable the monetary authority to achieve its policy goals, they would have to restirct their use of information.

Although the economic agents have a collective incentive not to use all the information available to them, they will actually do so only if they can overcome the concomitant prisoner's dilemma problems. These problems are more likely to be solved the longer the time horizons over which the agents pursue their

objectives and the greater their degree of ongoing repetitive participation in their industry. A socially desirable body of information may, with the passage of time, become embodied in a society's conventional wisdom. It may perpetuate itself in the form of several rules of thumb and a limited number of "economic truths" that are diligently repeated in the news media and business circles.

Thus, in the presence of externalities, not only is the monetary authority justified in maintaining its informational advantage over these private agents, but the agents have an incentive not to challenge this advantage. Even if the authority makes its superior information generally available, it is in their best interest not to use it fully. The authority then has an informational advantage which cannot be eliminated. In that event, systematic monetary policy could affect real variables such as production and employment simply because the monetary authority uses more information than the public in making its economic decisions.

The existence of externalities is not essential to this line of argument. Even if externalities were absent and the full-information general equilibrium were socially optimal, it would not necessarily follow that any expansion of the public's information set leads to economic activity which augments social welfare. In other words, even if Assumption 1 (above) holds, Assumption 2 (above) may not. With regard to the oligopolistic industry considered above, an increase in the amount of information available to the oligopolists does not necessarily mean that their objectives can be more fully attained. This is an issue in the theory of the second best which has not received much attention in the literature. In general, it is not clear that

every step in the direction of full information is collectively desirable. Economic agents who have significant market power and who understand the structure of the economy may restrict their use of information for this reason as well.

In sum, an assumption implicit in the recent literature on monetary policy, namely, that economic agents use all the information available to them, may not be valid under all conceivable circumstances. Economic agents may be aware that they cannot achieve their optimal levels of activity without government intervention and that such intervention is impossible when they use all the information they have.

In particular, if the natural rate hypothesis holds, then the monetary authority can influence real variables only by driving a wedge between actual and expected prices. Yet this wedge emerges only when the authority uses more information in formulating its economic decisions than the private agents use in formulating theirs. The private agents can ensure that this will happen by devising their rational expectations on the basis of a restricted information set.

But this is not the only way. An equally acceptable alternative is to devise non-rational expectations, e.g. adaptive expectations. In fact, it does not matter how the expectations are devised, as long as they have a more limited informational content than those of the authority and as long as the expectation-generating mechanism is systematic, i.e. predictable by the authority. Provided these conditions are satisfied, agents who know the 'true' model of the economy (with the exception of some additive disturbance terms) will be aware that their expectations make no difference to the level of economic activity. Regardless of their expectations, the monetary authority will induce the socially optimal general equilibrium state.

This argument reverses the standard result in the recent literature that it does not matter how monetary policy is devised so long as the policy is systematic, i.e. predictable by the private sector. The argument questions whether the role of private-sector expectations in modeling macroeconomic activity is invariably as significant as the recent literature indicates. If the monetary authority can predict private-sector expectations and can manipulate real economic variables in accordance with its policy goals, then it will take these expectations into account in formulating its monetary policy strategy. Consequently, these expectations will have no effect on economic activity.

At first glance, this argument may appear rather suspect. Do the private agents really have an interest in being deluded by the monetary authority? Or, if the authority reveals all its information, do the agents seek to delude themselves? However, such questions miss the point of the argument. Delusion is not at issue here. What is at issue is how much economic information the agents choose to use. They are not interested in information acquisition per se. Rather, they are concerned with profits. If the acquisition of a body of information does not promote these ends, then that information may not be acquired.

An analogy is to be found in duopoly theory. Consider an industry containing one "leader", who takes the price-quantity reaction function of his competitor into account when maximizing his profits, and a "follower", who maximizes his profits given the leader's quantity decision. To generate such behaviour, it is not necessary to assume that the follower is deluding himself. The follower may well be aware that the leader's quantity decision is not invariant with respect to the follower's actions. Nevertheless, the follower acts under the <u>assumption</u> that the leader's

produced quantity is a given constant. Unravelling the complexities of the leader's behaviour is not the primary concern of the follower. Rather, the follower is concerned with maximising his profits. If the assumption that the leader's output is fixed yields higher profits for the follower than any other hypothesis about the leader's behaviour, then the follower will act on the basis of that assumption. The follower simply chooses to use that subset of the available information which leads to his maximal profits.

The significance of the argument presented above does not lie in its explanation of the effectiveness of systematic monetary policy under rational expectations. A number of other considerations - such as those concerning the expectational bias during the process of information acquisition and the possible failure of markets to clear - appear to serve this purpose more cogently. The argument here is meant primarily to focus attention on a potentially important issue in the theory of monetary policy: do economic agents always use all the information available to them? In this paper, we have considered circumstances in which they have no incentive to do so.

FOOTNOTE

Actually a number of additional conditions must hold for the policy ineffectiveness result to emerge. For example, the monetary authority may have no manoeuverability advantage over the public (as in Fischer (1977) and Woglom (1979), and the consumption function may contain no real balance effect when the macroeconomic model includes capital accumulation (as in Begg (1980), Fair (1978), and Fischer (1979)). However, these additional conditions are not relevant to the argument presented here.

REFERENCES

Begg, D.K.H., "Rational Expectations and the Non-Neutrality of Systematic Monetary Policy," Review of Economic Studies, vol. 47(2), no. 147, Jan. 1980, 293-303.

Cyert, R.M. & M.H. De Groot, "Rational Expectations and Bayesian Analysis," Journal of Political Economy, 82(1974), 521-36.

DeCanio, S., "Rational Expectations and Learning from Experience," Quarterly Journal of Economics, 93 (1979), 47-57.

Fair, R.C., "A Criticism of one Class of Macroeconomic Models with Rational Expectations," Journal of Money, Credit and Banking, 10, Nov. 1978, 411-417.

Fischer, S., "Long-term Contracts, Rational Expectations and the Optimal Money Supply Rule," Journal of Political Economy, 83, Feb. 1977, 191-205.

_____,"Anticipation and the Non-Neutrality of Money," Journal of Political Economy, 87, April 1979, 225-252.

Friedman, B.M., "Optimal Expectations and the Extreme Information Assumptions of 'Rational Expectations' Macromodels," Journal of Monetary Economics, 5 (1979), 23-41.

Santomero, A.M. and J. Seater, "The Inflation - Unemployment Tradeoff: A Critique of the Literature," Journal of Economic Literature, 16(1978), 499-544.

Shiller, R.J., "Rational Expectations and the Dynamic Structure of the Macroeconomic Models: A Critical Review," Journal of Monetary Economics, 4 (1978), 1-44.

Taylor, J.B., "Monetary Policy during a Transition to Rational Expectations," Journal of Political Economy, 83 (1975), 83 (1975), 1009-21.

Woglom, G., "Rational Expectations and Monetary Policy in a Simple Macroeconomic Model," Quarterly Journal of Economics, 93 (1), Feb. 1979, 91-105.