Recent Developments in the Theory of Rules Versus Discretion

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General Features of Rules and Discretion

The older literature on rules versus discretion focused on the intentions and capability of the policymaker. Arguments for rules were based on imperfect knowledge about the economy and on policymakers' tendencies to further inappropriate ends, possibly motivated by interest groups.[1] But an intelligent policymaker could take account of incomplete information about the economy when deciding on the optimal discretionary policy. Then if the policymaker were also well-meaning, there was no obvious defense for using a rule in order to bind his hands in advance. Discretion seemed to be synonomous with flexibility, which one had no reason to deny to a smart, benevolent policymaker.

This perspective on rules versus discretion was changed by Kydland and Prescott (1977), who looked at rules as a form of commitment. A commitment amounts to a binding contract, which specifies in advance the actions that someone will take, possibly contingent on some exogenous variables that everyone can observe. In contrast, under discretion, a person promises only to take those future actions that will best further his objectives later on. (Such promises are easy to keep!) Thus, discretion is the special case of a rule or contract in which none of today's provisions restrict a person's future actions. In the area of private business dealings, it is natural to think about optimal forms of contracts, which would not usually be pure discretion. Similarily, for public policy, the perspective becomes the optimal form of rules or prior restrictions--even the smart, benevolent policymaker is likely to desire and use an ability to make binding promises.

Kydland and Prescott discuss various areas of public policy in which commitments are important. One example is patents, which encourage inventions,

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[1] See for example, Friedman (1960, Chapter 4).

but also restrict the supply of goods ex post. Under discretion, a policymaker who cares about "social welfare" would invalidate old patents ("once and for all"), but continue to issue new ones. However, the perception of this policy by potential inventors has adverse effects on new inventions, which soon become old inventions. Hence, the optimal policy contains a mechanism to preclude or at least inhibit the abolition of old patents. Then the details of this policy involve the standard tradeoff between the incentive to invent and the ex post restriction of supply.

The manner of committing future actions varies with the area of public policy. In some cases, such as the duration and scope of patents, the rules are set out in formal law. Then the costs of changing laws (possibly coming under constitutional restrictions against ex post facto laws) enforces the government's commitments. However, in the case of the Gold Standard Act in the U.S., the existence of a law proved in 1933 to be inadequate protection for those who held gold or made contracts denominated in gold.[2]

More often a government's commitments rely on the force of reputation, whereby people's expectations of future policy are tied in some fashion to past behavior. For instance, if a government defaults on its debts, then potential bondholders are deterred by the perception that future defaults are more likely. If a municipality sharply raises property taxes, and thereby reduces property values, then potential residents are deterred from moving in. But, as a general matter, the linkages between past actions and expectations of future behavior are difficult to formalize in a model.

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[2]For a discussion of the abrogation of gold clauses in public and private contracts, see Yeager (1966, p. 305). Additional discussions are in Nussbaum (1950, pp. 283-91) and McCulloch (1980).

Monetary Policy under Discretion

A major contribution of Kydland and Prescott was the recognition that monetary policy involves the same issues about commitments as do such areas as patents, default on government debt, and imposition of levies on previously accumulated capital (via changes in property taxes or in other taxes that fall on capital). In the case of patents it is obvious that a policymaker must worry about the link between current actions--such as eliminating past patents or changing the form of patent law--and people's perceptions about the value of presently issued patents. Similarly, the monetary authority must consider the interplay between today's choices--whether to engineer a monetary expansion or to change the "law" governing monetary policy-and people's beliefs about future money and prices.

Consider the example about the Phillips curve, as discussed in Kydland and Prescott (1977) and in Barro and Gordon (1983a, b). These models involve the following main ingredients. First, monetary policy works by affecting the general price level. In the simplest setting the monetary authority can use its instruments in order to achieve perfect control over the price level in each period. Second, unexpected increases in the price level (but not expected changes in prices) expand real economic activity. In other words, there is an "expectational Phillips Curve." Third, the "representative person," and hence the benevolent policymaker, value these expansions of activity at least over some range (which means that existing distortions make the "natural" level of output too small). In order to focus on the distinction between rules and discretion, the models assume unanimity about the public's desires and a willingness of the policymaker to go along with this objective. This is, there are no principal-agent problems. Finally, inflation is itself a bad--people value it only as a

device to create unexpected inflation and thereby higher levels of economic activity.[3]

This setup for inflation is structurally similar to the example about patents. At any point in time the policymaker is motivated to generate unexpected inflation in order to stimulate the economy. (The analogue is the expansion of supply via the abolition of past patents.) But people understand these incentives in advance and therefore form high expectations of inflation. Accordingly, the policymaker must choose a high rate of inflation just to stay even--that is, in order for unexpected inflation to be zero. Finally, this high inflation imposes costs on the economy. (The parallel is the decrease in inventions because of the expectation that current patents will not be honored later.)

Barro and Gordon (1983a, b) analyze the equilibria for monetary policy and inflation for the Phillips-curve model. In the case of pure discretion, the policymaker has no mechanisms for committing the future behavior of money and prices. Rather, he has a free hand to maximize social welfare at each point in time, while treating past events as givens. In this situation there is an incentive at each point in time to create surprise inflation in order to generate an economic boom. But individuals understand this motivation and formulate their expectations accordingly. Thus, actual inflation cannot end up being systematically higher or lower than expected inflation.

Overall, two conditions must be satisfied in equilibrium. First, people's expectations of inflation are correct on average, which is a

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[3]The analysis can be extended to incorporate the standard inflation tax or other real effects from anticipated inflation. Then the best rate of inflation need not be zero.

rational-expectations condition. Second, although the policymaker retains the power in each period to fool people via inflation surprises, he is not motivated to exercise this power. In order for this second condition to hold, the policymaker's drive to create unexpected inflation must be balanced by the marginal cost of inflation itself. In other words, inflation must be high enough so that the marginal cost of inflation equals the marginal benefit from inflation surprises. Only then will the chosen rate of inflation--which ends up equal on average to the rate that people expect--be incentive compatible in the sense of according with the policymaker's desire to maximize social welfare at each point in time. The important point is that this equilibrium involves inflation that is high, but not surprisingly high. Therefore, the economy bears the costs of high inflation, but does not receive the rewards that would arise from unexpected inflation.

The solution just described rests on the presence of benefits from surprise inflation, but does not depend on the existence of the expectational Phillips curve. An alternative model recognizes that surprise inflation amounts to a capital levy on assets, such as money and government bonds, that are denominated in nominal terms. At a point in time, unexpected inflation works like a lump-sum tax as a device for generating government revenue. Given that other taxes are distorting, the policymaker (and the representative person in the economy) would value the use of this lump-sum tax. Therefore, this model parallels the previous one with the Phillips curve, even though the source of benefit from unexpected inflation is different. There is an analogous discretionary equilibrium with high inflation, but with no tendency for unexpected inflation to be positive or negative.[4]

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[4]See Barro (1983) for an elaboration of this model.

In the example of the Phillips curve, the incentive to create surprise inflation hinges on the desire to expand economic activity. But this incentive depends in turn on some distortions that make the natural rate of output too low. The disincentive effects from income taxes and transfer programs are possible sources of these distortions.[5] Similarly, in the example where the government values surprise inflation as a lump-sum tax, there must be an underlying environment in which alternative taxes are distorting. In both cases, the existence of initial distortions underlies the prediction of high inflation. Calvo (1978) discusses the general role of existing distortions in these types of models. The main point is that the bad outcomes under discretion depend on the presence of these distortions.

Barro and Gordon (1983b) view the discretionary equilibrium as a positive theory of monetary policy and inflation under present-day monetary arrangements. Aside from predicting "high" average inflation and monetary growth, the model indicates the reactions to changes in the benefits from unexpected inflation or in the costs of actual inflation. For example, a rise in the natural rate of unemployment can raise the benefits from lowering unemployment through surprise inflation. It follows that a secular rise in the natural unemployment rate will lead to a secular rise in the mean rates of monetary growth and inflation. Similarly, the policymaker would particularly value reductions of unemployment during recessions. The implication is that monetary growth will be countercyclical, although such a policy can end up with no effect on the amplitude of business cycles.

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[5] These taxes and transfers may themselves be warranted as necessary counterparts of (valuable) government expenditures. Hence, there is no implication that the government is failing to optimize on the fiscal side.

A higher stock of nominally-denominated public debt raises the benefits from capital levies via surprise inflation. The model then implies that more public debt will lead to higher values of monetary growth, inflation and nominal interest rates (although not to higher unexpected inflation). In other words, the prediction is that deficits will be partly monetized. A similar analysis suggests that indexation of the public debt for inflation--which removes some of the benefits from surprise inflation--will tend to lower inflation and monetary growth. This prediction comes from the positive theory of the money-supply process, rather than from direct effects of indexation on the economy. Finally, a higher level of government spending tends to raise the benefits from lump-sum taxation, because the deadweight losses from other taxes would be higher. This change leads again to higher rates of inflation and monetary growth. The endogenous response of monetary growth implies that government expenditures are inflationary.

The model assumes that actual inflation is costly, but does not explain the source of these costs. Two frequently mentioned possiblities are the administrative expenses for changing prices and the transaction costs associated with economizing on cash holdings. The positive analysis of monetary policy implies that a downward shift in the costs of inflation will lead to more inflation. If people think that inflation is not a serious problem, then the economy will end up with a lot of inflation!

The analysis implies also that each flicker in the benefits from inflation surprises or in the costs of inflation will be reflected in variations in inflation. In contrast to an environment in which the government stabilizes prices, there will be substantial random fluctuations of inflation and monetary growth. Further, the variances of prices and money will be larger the greater the random

fluctuations in the variables that influence the benefits from inflation shocks. For example, if there are frequent supply shocks (which alter the natural rate of output), then inflation and monetary growth will be volatile.

Monetary Rules

The results under discretion contrast with those under rules, which are regimes where the policymaker can and does make commitments about future monetary growth and inflation. Under discretion, the equilibrium involved high inflation, but no tendency toward surprisingly high inflation. Hence, the economy suffered the costs from high inflation, but secured none of the benefits from inflation surprises. The policymaker can improve on this outcome if he can commit himself ex ante to low inflation. If this commitment is credible--which means that some mechanism prevents violations ex post--then people also anticipate low inflation. Therefore, the equilibrium would exhibit low and stable inflation,[6] with the same average amount of surprise inflation (zero) as before. These results support a form of "constant-growth-rate rule," although applied to prices rather than to the quantity of money, per se.

There is a tension in this type of rules equilibrium because the policymaker may retain the capacity to produce large social gains at any point in time by "cheating"--that is, by generating surprisingly high inflation. Then there may be a temporary economic boom or at least a substantial amount of government revenue obtained via a distortion-free tax. But, if such cheating were feasible and desirable, then people would understand the situation beforehand. In this case the low-inflation equilibrium would be untenable. (Sometimes people say

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[6]More generally, one can choose the average inflation rate that is optimal from the standpoint of the usual inflation tax.

that this equilibrium is "time inconsistent," although it is actually not an equilibrium at all.) Rather, there would be a high-inflation, discretionary equilibrium, as described earlier. That is why the enforcement power behind the low-inflation rule is crucial. There must be a mechanism for binding the policymaker's hands in advance, so that (surprisingly) high inflation cannot be generated later, even if such a choice looks good to everyone ex post. Note that the rationale for this "binding of hands" applies even though (or actually especially if) the policymaker is well-meaning. This type of commitment is necessary in order for low inflation to be incentive-compatible and hence credible.

Although the low-inflation, rules equilibrium is superior to the high-inflation, discretionary equilibrium, the rules equilibrium is still not "first best." The benefits from inflation surprises--for example, from lower unemployment or from the generation of distortion-free government revenue--reflect some external effects that have not been eliminated. It is the desire to approach the first-best solution via inflation surprises that threatens the viability of the low-inflation equilibrium. The pursuit of the first best tends to push the economy away from the second best of a rule with low inflation, and toward the third best of discretionary policy with high inflation. Again, this perspective highlights the importance of the enforcement power that makes a rule sustainable.

Contingent Rules

More generally, the optimal rule may set money or prices contingent on exogenous events, rather than being non-contingent. In some models, such as those where the monetary authority has superior information about the economy, a contingent reaction to business-cycle variables may help to smooth out business

fluctuations. However, the direct communication of the government's information may be a substitute for the feedback response of money.

Another example of contingent response is the association of wars with high growth rates of money and prices. High wartime inflation constitutes surprisingly high inflation from the standpoint of earlier times at which a war was not anticipated. In an equilibrium, the counterpart must be surprisingly low inflation during peacetime. This type of contingent rule may be desirable because it generates lots of easy revenue via the capital levy from unexpected inflation during emergencies. In particular, it is possible to hold down distortions from the income tax at the most important times, such as wars.[7] Although the necessary accompaniment is a loss of revenue during the non-emergencies, the net effect of this contingent policy is likely to be beneficial.[8]

Under the gold standard, governments did in fact tend to go off gold during wars, as in the case of Britain during the Napoleonic period and around World War I, and for the U.S. during the Civil War. This procedure enables a government to pursue the type of contingent policy for inflation that I sketched above. In this sense a movement off gold during wars is not necessarily a violation of the "rules." However the subsequent return to gold at the previous parity--as in Britain in the 1820s and 1920s and the U.S. in the 1870s--was probably an important part of the enforcement process.

One difficulty with contingent rules is that they may be difficult to verify. It is easy to confuse contingencies with the type of cheating that I

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[7]The government's ability to run deficits lessens this incentive, but does not eliminate it. Contingent on a bad draw, such as war, it tends to be desirable to trigger the distortion-free capital levy.

[8]Such an outcome obtains in the model of Lucas and Stokey (1983), which is exposited by Persson and Svensson (1984). These models feature public debt with a contingent real payoff, which turns out to be high during peacetime and low in wartime. If government bonds are nominally denominated and non-contingent (for reasons that escape me), the contingent behavior of inflation achieves the same end.

described earlier. Further, the policymaker would be inclined to explain away high inflation as the consequence of some emergency, rather than as a failure to conform with the rules. Canzoneri (1984) points out that this situation involves asymmetric information whereby the public cannot verify the nature of the policymaker's actions even after the fact. These considerations favor a rule that is relatively simple, such as a constant-growth-rate rule for prices or money. In any case the contingencies should be limited to well-defined events, such as major wars. Although this limitation may miss some gains from contingent action, the greater ease of enforcement makes it less likely that the situation will degenerate into a high-inflation, discretionary equilibrium.

The Policymaker's Reputation

Barro and Gordon (1983a) examine some possibilities for substituting the policmaker's reputation for formal rules. In this setting people's expectations of future inflation depend in some way on past performance. Unlike the case of pure discretion, the policymaker's choice of today's inflation rate assigns some weight to the effect on future inflationary expectations. Such considerations motivate the policymaker to hold down the rates of inflation and monetary growth.

The example considered in Barro and Gordon (1983a) is an application of repeated games as developed by Friedman (1971). Reputational equilibria emerge in which the rates of inflation are weighted averages of that under discretion and that under a constant-growth-rate rule. The higher the policymaker's discount rate, the greater the weight attached to the discretionary result. From a positive standpoint, the findings are qualitatively in line with those under discretion. The main difference is that the reactions of inflation to various

shocks--such as shifts in the natural rate of unemployment or in the size of government--are now smaller in magnitude. Hence, the variances (as well as the means) of inflation and monetary growth are smaller than those under discretion.

One difficulty with these types of reputational equilibria is that they depend on an infinite horizon for the game between the policymaker and the public. If there is a known, finite endpoint for the game, then reputational considerations have no weight in the final period. Anticipating this outcome, the force of reputation is also nil in the next to last period, and so on, working backwards up to the current period. In other words, a finite horizon causes the reputational equilibria to unravel.[9] However, if the game terminates in any period with a probability less than one--but there is no known finite horizon--then the repeated-games approach goes through. In this case the probability of termination effectively adds to the policymaker's discount rate in the solution.

In some contexts, such as those where a term of office with fixed length is important, the finiteness of the horizon eliminates the type of reputational equilibria considered in Barro and Gordon (1983a). But, even when an infinite horizon is tenable, there are difficulties with multiple equilibria. This multiplicity of solutions reflects the bootstrap character of the reputational equilibria. Namely if people base future beliefs on the policymaker's actions in some arbitrary fashion, then the policymaker is motivated in a range of cases to validate these beliefs. Hence, various equilibria conform with rational expectations as well as with period-by-period optimization by the policymaker.

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[9]This result, as applied to the "prisoner's dilemma" problem, appears in Selten (1978).

In Barro and Gordon (1983a) the equilibria can be indexed by the length of the period over which people expect high future inflation when they observe high current inflation. In Friedman (1971) the analogous "punishment interval" is infinite, while in the basic model of Barro and Gordon (1983a) it is one period. Since the punishment does not arise in equilibrium in these models, the only effect of a longer interval is more deterrence against choosing high inflation. Therefore a longer interval is at least as good as a shorter one.

Canzoneri (1984) uses the approach of Green and Porter (1984), who treat the length of the punishment interval as a parameter. In Canzoneri's model the policymaker has private information about the economy, which the private agents can never observe directly. This information sometimes gives the policymaker good reason to inflate on a contingent basis. But people cannot tell whether he is instead acting in a discretionary manner so as to exploit low inflationary expectations. It therefore turns out that the punishments, which take the form of high expected inflation, occur from time to time as part of the equilibrium. Since these punishments are undesirable, per se, a longer punishment interval imposes costs, which trade off against a greater deterrent value. Therefore the optimal punishment interval tends to be finite. Nevertheless it is unclear what process would cause the interval to take on either this optimal value or some other value. Hence, the problem of multiple equilibria remains. The solutions also still unravel if the horizon is finite.

Reputation in Models with Different Types of Policymakers

The basic difficulty in the preceding treatment of reputation is that there is nothing to learn about in the models. The policymaker forms more or less "reputation" for high or low inflation; yet people know everything about the

policymaker's objectives and abilities from the outset. Therefore the link between performance and beliefs has the bootstrap character mentioned before, rather than building directly on the revelation of information.

In order to provide a basis for learning it must be that potential policymakers differ in ways that are not immediately observable. These differences could involve preferences for inflation versus unemployment, capacities for making commitments about future monetary growth and inflation, lengths of horizons, and so on. Observed choices for inflation or monetary growth may alter the probabilities that people rationally attach to the policymaker's being of one type or another. Then this process would determine the connection between performance and expectations of future inflation or other variables. The policymaker, who knows his own type, takes this learning and expectational process into account when deciding how to act. In particular, the policymaker may wish to influence people's beliefs in one way or another. A full analysis of reputation considers these incentives, as well as the rationality of the public's expectations. Aside from giving content to notions of reputation and learning, this approach turns out to have two other advantages. First, the results no longer depend on an infinite horizon, and second, the equilibrium is often unique.

Models of this type have been applied to problems in the area of industrial organization by Kreps and Wilson (1982) and Milgrom and Roberts (1982). Applications of their method to monetary policy include Backus and Driffill (1984), Tabellini (1983), and Barro (1985). In the following I sketch an example of this application.

Suppose that there are two types of policymakers. Type I makes a serious commitment to low inflation. Type II is incapable of commitments, but acts in

the usual discretionary manner to trade off the costs of inflation against the benefits of inflation surprises. (Results are similar if the type I people worry more than the type II about inflation.) People cannot tell directly which policymaker is in office, but must make inferences from the observed choices for monetary growth and inflation. Specifically, there is some prior probability that the policymaker is of type I. Then, as long as good performance (low inflation) is observed, people upgrade this probability via Bayes' Law. In other words, an additional period of low inflation makes people more confident that the policymaker is committed to low inflation. The type II policymaker takes account of this inference process when deciding how to behave. Notably he may be motivated to choose low inflation for awhile in order to acquire some (false) reputation for being type I. Thereby, the type II person can hold down inflationary expectations, which helps to lower the overall costs to the economy. In particular, a low value of expected inflation creates an opportunity for large gains through inflation surprises once the type II policymaker decides to reveal his true nature.

For typical parameter values the equilibrium involves an interval over which expected inflation is a weighted average of the low committed value and the higher value associated with discretion. The type I policymaker faithfully generates low inflation in each period. But, since people fear that he may be type II, this low inflation rate is below the expected rate. The implied string of negative inflation surprises imposes costs, which may take the form of a recession. In an environment where the policymaker's type is uncertain, these costs are necessary in order to fulfill the type I person's commitment to low inflation.

If the policymaker turns out to be type II, then he mimics the low inflation of the type I person for some interval. But the probability rises over time that the type II person will opt for high inflation. In particular, as he approaches the end of his "term in office" (finite horizon), this probability approaches one. Thus, there is eventually a surge in inflation, which is mostly unanticipated. The inflation is surprising partly because the policymaker might have been type I, and partly because the timing of the type II person's surge is uncertain. In any event the surprise inflation generates benefits, perhaps in the form of a temporary economic boom. Having opted for high inflation, the type II policymaker reveals his incapacity for commitments. Therefore the equilibrium in later periods involves high and expectedly high inflation, as in the usual model of discretionary behavior.

Because of the benefit from the inflation shock it turns out that the overall results are actually better, ex post, if the policymaker happens to be the "bad guy" (type II) rather than the "good guy" (type I). On the other hand, outcomes also improve if policymakers are more likely, ex ante, to be type I. Basically, a higher prior probability of being type I reduces inflationary expectations, which is desirable regardless of the policymaker's type. From a normative standpoint, these findings do not favor the systematic choice of type II people to run the government. After all, one cannot simultaneously raise the prior probability of the policymaker's being committed to low inflation (type I) and also pick uncommitted people (type II) more often ex post.

The results just described have the virtue of stemming from a unique equilibrium and of applying even when the horizon is finite. The model also determines a process of learning about the policymaker's type in a context of incomplete information. There is a meaningful concept of reputation in the

sense of the probability that people rationally attach at each point in time to the policymaker's being of one type or another.

On the other hand, the analysis may be too sensitive to the traits of individual policymakers. In this model the behavior of inflation depends on the realization of the policymaker's type with respect to the capacity for commitments, tastes for inflation versus unemployment, and so on. It may be preferable to have a theory that predicts inflation without assigning a major role to the individual characteristics of the persons who happen to be in office. But, if there are no differences in potential policymakers, then there seems to be nothing to learn from performance. In that case we are back to the previous difficulties in modeling the policymaker's reputation.

Types of Monetary Rules

In this section I assume that the choice is among types of monetary rules, rather than between rules or no rules (that is, rules versus discretion). The choices are often divided between quantity rules and price rules. In the former category the policymaker aims for a target path of a monetary aggregate, such as the monetary base, or M1, or a still broader concept of money. Friedman's (1960, Chapter 4) proposal for a constant-growth-rate rule for M2 falls into this class. From October 1979 until late 1982, the U.S. Federal Reserve claimed to be following a policy of this general type, which was framed in terms of monetary targets. But it is hard to see from the data that the growth of monetary aggregates became notably more stable, say from quarter to quarter. On the other hand, interest rates did show unprecedented volatility, which many people think related to the Fed's new policy.

Under a price rule the monetary authority uses its direct instruments--which might be open-market operations, the discount rate, a pegged exchange rate, or a set price of gold--in order to achieve a desired path for some target price. The target might be a general index of prices, the prices of specified commodities, an interest rate, or the exchange rate itself. Examples of price rules are the gold standard, other commodity standards, a regime with a fixed exchange rate, and Irving Fisher's (1920) "stable-money" proposal for varying the price of gold in order to stabilize the overall cost of living. A policy of pegging a nominal interest rate is also a price rule, but an incomplete one. This type of rule requires some additional specifications in order to pin down the levels of prices and other nominal variables (see, for example, Sargent and Wallace, 1975, and McCallum, 1984). Therfore, an interest-rate rule is not a substitute for a rule that specifies the quantity of some monetary aggregate or the level of some price.

Generally, people care about a variety of current and future prices, rather than the quantities of monetary aggregates, per se. Therefore, the case for a quantity rule must rely on ease of implementation and verification.[10] Even this argument is compromised by the monetary authority's tendency to shift from

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[10] I do not mean to argue that a constant-growth-rate rule for money, if implemented in the U.S. say 30 years ago, would have been inferior to actual monetary policy. A quantity rule is likely to be better than discretion. Also, the difference between a quantity rule, say for M1, and a rule for stabilizing the general level of prices derives from movements in the real demand for M1. But shifts in this demand--especially the changes in velocity that are induced by shifting nominal interest rates--would probably have been mild if the monetary authority had adhered for a long time to a constant-growth-rate rule. However, when starting from a state of high and volatile nominal interest rates, there are serious problems in the implementation of a quantity rule. One problem is the possibility of severe deflation during the transition to lower inflation, since real cash balances must rise dramatically. The advantage of a price rule is that it allows for large infusions of nominal money during the transition. Further, since this monetary expansion arises only in response to the actual behavior of prices, there is no threat to the credibility of the system.

one target aggregate to another as it finds convenient on other grounds (see Hetzel, 1984). Such a regime involves feedback from unspecified ultimate targets to money, rather than actually being a quantity rule.

In discussing Friedman's monetary rule, Tobin (1965, p. 472) notes the difficulty in providing an unambiguous definition of "money." Then he criticizes "Friedman and his followers" because they seem to be saying that "We don't know what money is, but whatever it is, its stock should grow steadily at 3 to 4 per cent per year." In fact, a workable monetary rule would seen to entail settling on some definition of money and then dictating the behavior of this concept. Ex ante, the precise definition of money may matter little. Yet it is important to stick with the chosen definition in order to avoid discretionary behavior. Otherwise the monetary authority could always find a revised definition that delivers the desired behavior ex post. More generally, this example illustrates the value of understanding Milton Friedman's ideas. After all, he is usually correct even when moved by an invisible hand rather than a fully worked out theoretical model.

As in the case of quantity rules, the argument for focusing on a narrow band of prices, such as gold or an exchange rate, is that such regimes are relatively easy to operate and monitor. Otherwise, it would be preferable to stabilize a broad index of prices, possibly using the price of gold, as in Fisher's proposal, or some other price instrument in order to attain the desired behavior of prices in general.

At the risk of engaging in normative economics (see below), I would advocate a modified Fisherian regime in which open-market operations, rather than the price of gold, were used in order to achieve a target path of a general price

index, such as the deflator for the GNP.[11] This type of regime involves a form of feedback, whereby a price level above target for a specified length of time triggers lower growth of the monetary base, and vice versa for a price level below target. The objective might involve a moving path of prices, which allows for nonzero inflation. However, the ease of monitoring the system, as well as prevention of "once-and-for-all" discretionary adjustments to the level of prices, argues for specifying the target as a constant price level. This setup would also produce a convenient monetary unit, which is one that maintains a nearly constant purchasing power.[12] One possible drawback of this scheme is that it severely limits the government's revenue from printing money. However, it would be possible to permit deviations from the target price level--and thereby more revenue from money creation--during major wars. This kind of provision parallels the tendency under previous monetary regimes for governments to depart from gold in wartime.

A credible rule of this type works to stabilize prices even if there are lags in observations of price indices, or in the feedback reaction of money to past prices, or in the effects of (exogenous changes in) money on the price level. In particular, if prices rise above target, then people know that future monetary actions will eventually bring prices back down to target. The exact timing of the monetary reaction is not crucial. In any event the expectation of future deflation raises the current real demand for money, which lowers today's price level. Hence, there is a form of stabilizing speculation that improves the functioning of the system.

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[11]Simons (1936), who was concerned mostly with the superiority of rules over authorities, also favored a price rule over a quantity rule.

[12]See Hall (1982) for a related discussion.

Overall, the proposed rule would generate a near zero mean inflation rate and a small forecast variance of future price levels. In such a regime the prices of individual commodities would be accurate guides for the allocation of resources. As in Hayek (1945), monetary policy would provide for a stable economic background that enhances the flow of information and thereby promotes efficiency.

Recently some people have suggested that monetary policy aim at stabilizing nominal GNP, rather than the general price level (see, for example, Hall, 1980, and Taylor, 1984). Since nominal GNP is the product of real GNP and the GNP deflator, this rule prescribes inverse feedback of money to two things: first, excesses of real GNP above target, and second, excesses of the deflator over target. By contrast, the price-stabilization rule dictates feedback only to the second item; given the price level, fluctuations in real GNP do not induce any reactions of monetary instruments.

In order to evaluate proposals for stabilizing nominal GNP, it is necessary to ask why feedback from real GNP to money is desirable. This reaction must mean that the monetary authority does less good a job of stabilizing the overall price level. That is, there are occasions when the policymaker accepts greater departures of the price level from target in order to effect the desired response of money to fluctuations in output. But then there must be some gain from these monetary reactions to output that justifies the accompanying increase in fluctuations of the general price level.

In many theories associated with the "new classical macroeconomics," such as Sargent and Wallace (1975), the regular reaction of money to real

activity does not smooth out the business cycle.[13] Since people know that recessions inspire monetary accelerations, there are no systematic surprises. Then, if only the surprise movements in money matter for real variables, there would be no implications for the business cycle. It follows that it would be preferable to limit monetary policy to the objective of stabilizing the general price level. Any broadening of this objective threatens people's accurate perceptions of prices (which has adverse real effects), but provides no offsetting benefits.

On the other hand, Keynesian theories with sticky prices suggest that regular feedback from output to money can (usefully) smooth out fluctuations in real economic activity. Hence, although it means an increase in the volatility of prices, it is nevertheless worthwhile for money to react systematically to variations in real GNP.

In effect, the proposal to stabilize nominal GNP is an attempt to unite the principal warring factions of macroeconomists. The new classicists are supposed to be happy because monetary policy is governed by a rule, and that rule does entail stabilization of some nominal magnitude. Then the feedback response of money to real GNP is to be regarded as a minor nuisance, most of which the private sector can hopefully filter out.

Keynesians are supposed to be happy with the scheme because it allows for an active response of money to recessions and booms. Presumably most Keynesians would also accept the feedback from prices to money, although they may not opt for the equal weighting attached to fluctuations in real GNP vesus

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[13]This conclusion also obtains in purely real theories of business cycles. In other models monetary activism can affect the character of the business cycle, but not in a desirable manner. In these cases it follows immediately that feedback from output to money should be avoided.

fluctuations in the general price level. Apparently, the main thing that Keynesians have to give up is their "commitment" to discretionary monetary policy, which seems little to ask.

The choice between the two objectives--stabilizing the general price level versus stabliizing nominal GNP--corresponds to the weights one attaches to the validity of the two competing viewpoints about macroeconomics. (Surely one of these views must be correct!) If one attaches little weight to Keynesian theories with sticky prices, then the policymaker's preferred objective would be stabilization of the general price level.

Positive versus Normative Theories of Government Policy

I have been vague in this paper about whether I am engaging in positive or normative economics. In Barro and Gordon (1983a) we intended to carry out a positive analysis of monetary policy, given that the existing institutions dictated an environment of discretion. In this setting the policymaker could not opt for a rule, under which there would be meaningful commitments about future money and prices. Given these institutional constraints, we analyzed the day-to-day operating characteristics of the monetary authority. We also observed that the advice of economists would not be especially relevant at this level.

Gordon and I contrasted the results under discretion with those under a rule, which was an alternative institution where the policymaker could and did make some commitments about future money and prices. In order for this comparison between discretion and rules to be interesting, it must be that both setups are feasible under some circumstances. That is, there must at some level be a choice of whether to create an institutional arrangement that does or does not permit commitments about future money and prices. The process of creating

institutions might involve substantial lumpy costs, which means that changes would occur infrequently. But the choices should be as much subject to positive analysis as are those about day-to-day operations under a given institutional mode. Further, if an economist labels the actual institutional selection as inferior to the non-chosen option, then what does that labeling mean? Possibly the economist has unearthed new knowledge, but other possibiities are more likely. Although Buchanan and Tullock (1962) and Buchanan (1962) argue the opposite, it is unclear why the advice of economists is more pertinent at the level of institutional choice than it is at the level of day-to-day operations.

I suppose the answer is that economists' advice has some role as part of the economy's overall production process. Then the value of this advice is measured in the same way as that of other factors of production. Namely economists' market wages--rather than claims to save the economy vast sums through policy advice--tell us something about the group's productivity. Although the wages of economists are fairly high (in the U.S!), they still represent a negligible proportion of the GNP.

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