On the Fragility of Reputational Equilibria under Systematic Uncertainty: What is Wrong with Rational Expectations *

1. Introduction

The literature on credibility of monetary policies[1] has extensively shown that when the distribution of information across the economy is asymmetric and the objective function of the policy maker is known to the economic agents, it may be difficult for the policy maker to build up a reputation and to lead the economy to some optimal reputational equilibrium state if his goals are somewhat in conflict with those of the economic agents. This happens because the informational discrepancy between the policy maker and the economic agents may be exploited by the policy maker to pursue his goals without incurring in the punishment schemes set up by the economic agents. In other words, it is the (although limited) scope for 'cheating' that arises because of the imperfections in the monitoring abilities of the economic agents that makes the establishment of reputation so difficult.

In this paper we examine the case in which the imperfect monitoring of the policy does not derive from the existence of some informational asymmetry but directly from a limited monitoring ability of the economic agents in a framework that is closest in its essence to that of complete information. An example is provided in

[1] See for example the seminal papers of BARRO and GORDON (1983a, 1983b), CANZONERI (1985), BACKUS and DRIFFILL (1985), CUKIERMAN and MELTZER (1986), and the up to date survey of ROGOFF (1989).

which the policy maker can successfully exploit the limited monitoring abilities of the economic agents to collect arbitrarily large gains in terms of his objective function. It is remarkable that this possibility does not fade out even as the monitoring ability of the economic agents becomes better and better and, in the limit, perfect. In other words, even with imperfect monitoring abilities that are arbitrarily close to the standard of perfection, the emergence of some kind of optimal reputational equilibrium becomes practically impossible, because the economic agents have no possibility to prevent the policy maker from inflating the economy.

This result deserves attention, in that it shows that the absence of limitations in the monitoring abilities of individuals is more crucial for the existence of reputational equilibria than the absence of informational asymmetries. In this latter case, in fact, the existence of reputational equilibria is sometimes problematic, but possible in principle. Our example shows instead that imperfections in the individual monitoring abilities destroy the very possibility of a reputational equilibrium.

This is a serious flaw of the literature on credibility and reputation, because it clashes with two elementary stylized facts: that economic agents have imperfect monitoring abilities and that issues of reputation and credibility are important for the assessment of the effects of monetary policies (see e.g. Sargent, 1986). Therefore, as it stands, the existing literature does not provide a convincing explanation of the existence of reputational effects in the real world policy game.

In this paper it is argued that this inadequacy must be traced back to the characterization of rational behavior that is ruling in the literature in the wake of Lucas (1976). This argument will lead us to a substantial rejection of this characterization. The consensus about the rational expectations approach to economic modeling has been substantially undermined in recent years,[2] but rational expectations models are still widely used today in policy analyses. Our argument suggests that their use in policy analyses is even less motivated than their use as rigorous theoretical description of the working of the economic system.[3] As a consequence, a major change in the analytical framework is required in order to achieve a sensible modelization of reputational forces in the conduct of monetary policies.

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[2] See BUITER (1989) for an ample survey of critical results.
[3] In SACCO (1990a) we try to give a general theoretical account of the reasons of this lack of motivation.

2. Rationality, systemic uncertainty and rational expectations: a general discussion

The rational expectations approach to economic modeling is based on the contention that simple macroeconomic models in which agents are fully rational (*viz.*, they are assumed to possess unlimited – or almost so – abilities in gathering and processing information) are a sensible basis for policy analyses and prescriptions (see e.g. Barro, 1989).

If this claim has to be credible, robustness of the results with respect to departures from the paradigm of full rationality must be required because in realistic contexts individual abilities to collect and process information are limited. However, there are examples in which these models display no robustness with respect to departures from full rationality. One such example will be provided in section 3.

In fact, it is the very notion of rational behavior that is implied by the rational expectations approach that is basically flawed. In a rightly famous paper, Lucas (1976) argues that economic agents do react to environmental changes that are systematically predictable and that affect the agents' welfare. This is a natural consequence of the fact that the individual optimization of (say) consumption and labor supply decisions is conditioned on the acquisition and the elaboration of information regarding the available profit opportunities, and therefore economic agents must be optimizers also in information gathering and processing activities.

The above line of reasoning is hardly questionable. What is seriously questionable is the characterization of rational behavior that should emerge from it: economic agents are fully rational if there is no limitation in their abilities as to the acquisition and elaboration of information that is relevant for their optimizing decisions. Unlimited abilities to acquire and process information are not desired by economic agents for their own sake. They are desired *if they enhance their possibilities to exploit the available profit opportunities.* Therefore, the absence of limitations in information gathering and processing abilities is in itself neither a necessary nor a sufficient condition for the efficient exploitation of the available profit opportunities. One can construct examples in which non-rational traders in the above sense perform better than rational ones in the exploitation of profit opportunities (see e.g. Blume and Easley, 1989).

Rather than being a requirement of individual rationality, the rational expectations hypothesis is a requirement of absence of systematic uncertainty: a 'rational' agent is one that is able to figure out and solve the same problem (or 'almost' the same problem in the case of informational asymmetries) faced by the model maker. In other words, he has an *objective* picture of the universe in which he is living: it is as if there was a big blackboard on which all of the relevant equations that define the agent's decisional problem are written down and clearly readable. At most, it may happen that something (such as the value of a parameter) has been wiped out and he must fill the blanks. But generally the economic agent knows precisely what is going on as well as the model maker does. Whereas, in a situation of systematic uncertainty there is a certain amount of information that is relevant for the welfare of economic agents but is definitely out of their reach: agents are not able to aquire it no matter what they do.

The absence of systematic uncertainty can be a nice wishful thinking, but it has nothing to do in principle with rational behavior. No one in the real world is able to write down the correct law of motion of the economic system, but this does not mean that no one is able to pick up profit opportunities in the real world. Moreover, people that are able to write down and solve complicated structural models do not display in general a superior ability in making large profits on the markets.

The above discussion may be of help in explaining why the introduction of informational asymmetries produces outcomes in terms of robustness of reputational equilibria that are so different from the ones brought about by the introduction of limitations in the individual monitoring abilities. The introduction of informational asymmetries is not in principle a significant departure from the situation of absence of systematic uncertainty. The possibility of inferring the missing information from the observation of the state variables is in principle open in such a context (see *e.g.* Grossman, 1981). The introduction of imperfect monitoring abilities means instead that the agents will never be able to know the policy maker actions unless he decides to reveal them to the agents. If the policy maker has an incentive to do so, he can exploit this informational advantage.

The logic of the argument (that also lies behind our example in section 3) is simple. If the economic agents cannot monitor the policy

maker's actions perfectly, and the policy maker has an incentive to inflate the economy, he can do so until he stays within the belt of inflation figures that cannot be monitored by the agents. The argument applies however small the limitation in the agents' monitoring abilities, as far as the policy maker has a perfect control on the inflation figures up to an infinitesimal order of magnitude. As far as their monitoring abilities are effectively limited, economic agents will never be able to detect the inflationary choices of the policy maker. This of course destroys any scope for reputation, both on the policy maker and on the economic agents sides.

This story has nothing to do with the rationality of economic agents. They may well be perfectly able to exploit the *available* profit opportunities. The fact that they are not able to exploit profit opportunities that are not available because of the existence of a physical impossibility to detect them does not say much. The lack of robustness of results with respect to the introduction of systematic uncertainty only proves that the empirical relevance of the model is scarce. If the literature insists on the fact that the absence of systematic uncertainty is a *normative* requirement deriving from rationality of behavior there is little chance to understand the working of actual economic systems, in which the existence of systematic uncertainty is a basic part of the picture. More specifically, if it is assumed that economic agent *must* be aware (or must be potentially aware, in the case of imperfect information) of the policy maker's actions as a consequence of their rationality, there is little chance to understand the working of reputational forces in real policy games.

3. 'Fractal' inflationary policies with imperfect monitoring abilities

In this section we will translate the discussion of section 2 into a formal model. Nothing new will be added to the previous discussion apart from some concreteness. This model provides an example of the fragility of reputational equilibria with respect to the introduction of systematic uncertainty via imperfections in the monitoring abilities of the economic agents. It is important to stress that the particular behavioral hypotheses adopted here have no pretence of realism; it is hard to think of them as realistic, in fact. This is not a problem for us,

however, since our purpose is that of providing a *destruens* example, rather than that of studying a policy problem with an empirical relevance.[4]

Ours is a simple model of inflationary policy. Time is continuous. The policy maker, Nasty Ned, has a direct control over the inflation rate at any given moment in time. His objective is that of maximizing the rate of inflation at any time over an infinite horizon (in order, say, to reduce the real cost of the debt service in the presence of a huge and increasing debt built up through years of incautious deficit spending policies). Our Nasty Ned does not bother (or acts if he knew nothing about) transversality conditions and monetarist arithmetic and really thinks he can go on forever inflating the economy. In fact, the only obstacle on his way are the economic agents, that really hate having any rate of inflation different from zero (perhaps because they have had enough of price instability in the past). In order to make sure that this is the case, the economic agents have devised a sort of quasi-capital punishment scheme, that makes the resort to inflationary policies quite inattractive even for our Nasty Ned if he was caught in the light of the day. The only chance he has to inflate the economy, therefore, is by outsmarting the economic agents.

To rationalize the short-sightedness of Nasty Ned, we can say that he does not understand, or simply does not believe, that a purely inflationary finance has to come home to roost eventually. As a consequence, he actually behaves as if his 'preferred' policy over a finite period of time were the restriction on the relevant time domain of the 'preferred' policy over the infinite horizon. Our Nasty Ned is therefore, in a sense, boundedly rational, since he thinks that he can outsmart the economic agents forever, contrary to the classical argument of Sargent and Wallace (1984). In other words, Nasty Ned does not have a full perception of the binding constraints on his policy choices. This is a delicate point because it is far from obvious that if Nasty Ned had a full perception of these constraints his choice of the objective function would be unchanged. On the other hand, the policy maker's s objective function is a statement of his *preferences* and, as it is known, rationality concerns one's choice of action *given* his preferences, and talking of rationality of preferences is very close to nonsense.

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[4] For an example of a general, positive theoretical analysis of the introduction of systematic uncertainty in a model with information processing agents see HEINER (1989).

Here the inadequacy of the rational expectations approach to rational behavior becomes particularly evident. The crux of the issue is the fact that what the policy maker wants to do largely depends from the way in which he thinks the economic system works, and this latter fact *is* a matter of rationality. Here it is not simply an issue of state-dependent preferences; it is rather the *representation* of the overall decisional problem that affects preferences.[5] Therefore, the assumption of absence of systematic uncertainty (*viz.*, rational expectations) on the part of the model maker amounts in this case to an implicit restriction on the policy maker's preferences that is totally unjustified from a *normative* point of view. Once again this is a rather general point that can be extended practically to the whole of policy models with rational expectations that are available today. However, here we will not insist on it any further.

Let us now describe our problem in more detail. Nasty Ned's objective function, to be interpreted as his personal 'utility', is given by

$$U = \| \pi(t) \|_{t \in [0, \infty]} \tag{1}$$

where $\pi(t)$ is the rate of inflation at time t. In other words, Nasty Ned's aim is to inflate as much as possible over the economy's lifetime. The economic agents' preferences for every time period are given by

$$V(t) = - [\pi(t)]^2 \tag{2}$$

That is to say, every rate of inflation different from zero hurts economic agents.

The punishment scheme adopted by the economic agents is as follows. If there is a time $\hat{t}$ *at which* $\pi(t) > 0$, then the policy maker is charged of a penalty $\hat{q}$ for a given lapse of time $\hat{\delta}$, that is, from $\hat{t}$ onwards, Nasty Ned objective/utility function becomes

$$U = \begin{cases} \| \pi(t) \| - \hat{q}, & \text{for } t \in [\hat{t}, \hat{t}+\hat{\delta}\,] \\ \| \pi(t) \|, & \text{for } t > \hat{t}+\hat{\delta} \end{cases} \tag{3}$$

If moreover there is a subsequent time t' at which $\pi(t') > 0$, then a new punishment is activated with $q' > \hat{q}$ and $\delta' > \hat{\delta}$ Here it is assumed that the punishment is a 'quasi-capital' one, that is, the q's are so huge that it is never convenient to Nasty Ned to inflate if he is likely to be detected.

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[5] See *e.g.* TVERSKY and KAHNEMAN (1986).

The economic agents' ability to monitor the actual rate of inflation is limited. In particular, it is assumed that

a) economic agents are unable to detect inflation under a critical threshold ε. In other words, the punishment scheme (3) is activated only if $\pi(t) \geq \varepsilon$.

To enhance agents' possibilities, it is assumed moreover that

b) even in the case in which $\pi(t)$ lies below ε but is strictly positive, economic agents are able to detect it as far as it stays at a *fixed* value for a positive time interval, that is, if $0 < \pi(t) = \eta < \varepsilon$ for any t_0, ξ such that $t \in [t_0, t_0 + \xi]$. If instead the inflation rate is always changing and it stays below the critical threshold, they are not able to 'trace' it. This assumption tries to capture the fact that simple inflationary policies are detected relatively more easily by the public than more complicated ones;

c) there is a small but positive probability λ that if $\pi(t)$ stays in the vicinity of ε for too long, then the economic agents may suspect that Nasty Ned is cheating because of the cumulative effect of the inflationary policy. In this case, the economic agents resort to a costly, temporary improvement of their monitoring abilities that makes ε fall to some $\varsigma(\varepsilon)$ for a stochastic lapse of time.

The hypotheses a-c above bring about some restrictions on Nasty Ned's range of possibilities, of which he is aware; they are constraints on the maximization of U. Condition a implies that he can never inflate more than ε at any time t. Condition b implies that he is forced not to inflate at a given rate but to change the rate of inflation from time to time in order not to be traced by the economic agents. Condition c implies that Nasty Ned cannot simply let the rate of inflation stay slightly below the critical threshold at any t, and that to prevent the effect of cumulated inflation from becoming too visible, he has sometimes to let the inflation rate fall near to zero to let the time average go down by a safe amount.[6]

As an example of an inflationary policy that fulfills these requirements we consider the following 'sawtooth' policy:

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[6] Notice that the infinite horizon assumption rules out backward induction problems.

$$\pi(t) = \begin{cases} \alpha t, & \text{for } t \in [0, \frac{\varepsilon}{\alpha}) \\ \alpha(t, -\frac{\varepsilon}{\alpha}), & \text{for } t \in [\frac{\varepsilon}{\alpha}, 2\frac{\varepsilon}{\alpha}) \\ \dots & \end{cases} \quad (4)$$

Our 'sawtooth' policy is a sort of 'stop and go': Nasty Ned inflates the economy at a growing rate; as this rate becomes too close to the critical threshold, he suddenly makes the rate fall back to zero to prevent the effect of cumulated inflation from becoming too visible and then starts again.

Notice that the policy (4) is by no means optimal in any particular sense. It is just a policy that fulfills the requirements a-c. However, it is completely apt for our purposes. In general, we will limit our attention to 'reasonable' deterministic policies, that is, to deterministic policies that have at most a countable number of discontinuities over time. In terms of Nasty Ned's objective/utility function, what counts is how much a given policy actually inflates the economy. From a geometrical viewpoint, the inflationary potential of a given policy of the 'sawtooth' class is given by the ratio of the length of the policy's time profile to the length of the time span over which the profile is defined.[7] This is clearly given by the ratio of the overall length of the 'sawteeth' for every given time span $[0, T]$ to the length of the time span -- that is, T.

Let us consider now a given, arbitrary finite horizon $[0, T]$. If Nasty Ned's inflationary policy consisted of just one 'sawtooth' over this horizon, the angular coefficient α should be equal to ε/T. This would clearly be a nonoptimal, let alone risky, choice, in that it would imply a systematically increasing pattern for the inflation rate over the whole horizon. The utility associated to this policy is, after elementary calculations, readily found to be $\varepsilon\sqrt{1+1/\alpha^2}$. As α grows, that is, as the number of 'sawteeth' for a given time span is increased, so is the inflationary potential of the policy. It is in fact straightforward to show that, for a given T, the number of 'sawteeth' is given by $n = \alpha T/\varepsilon$. As a consequence, one has that the length of the 'sawteeth' over a given time span of length T, $l(T)$, is given by

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[7] The length of the time span defines the polar case of zero inflationary potential: $\pi(t)$ is steadily equal to zero over the whole time horizon; the corresponding profile thus coincides with the time axis.

$$l(T) \equiv \| \pi(t) \|_{L^{\pm}[0,T]} = \frac{\alpha T}{\varepsilon} \cdot \varepsilon \sqrt{1 + \frac{1}{\alpha^2}} = \alpha T \sqrt{1 + \frac{1}{\alpha^2}}$$

Therefore, the inflationary potential $\Pi(T)$ of our policy in the given time span $[0, T]$ is given by

$$\Pi(T) \equiv \frac{l(T)}{T} = \alpha \sqrt{1 + \frac{1}{\alpha^2}} \tag{5}$$

Notice how $\Pi(T)$ is quite independent from ε: for every given threshold level of the monitoring ability of the economic agents, no matter however small, there is always the possibility to inflate if α is chosen properly. In particular, as α increases, $\Pi(T)$ grows without bound and, from (5), one has in conclusion that

$$\lim_{\varepsilon \to 0} \lim_{\alpha \to \infty} \Pi(T) = \infty$$

The passage to the limit with respect to α can be interpreted as a sequence of 'stop and go' inflationary policies in which the speed of each inflationary run (*i.e.* the slope of each 'sawtooth') is increasing without bound and conversely the length of each run is decreasing to zero, up to the point in which the inflation rate is instantaneously zero, up to the point in which the inflation rate is instantaneously taken close to the threshold and then instantaneously taken back to zero for an uncountable infinity of times. The passage to the limit with respect to ε means that the critical threshold is getting nearer and nearer to zero, and therefore that the belt of inflationary figures that cannot be monitored by the economic agents is shrinking more and more: economic agents become increasingly able to monitor the policy maker's actions. Contrary to the intuition, however, as the belt shrinks ($\varepsilon \to 0$) the 'sawtooth' profile does not tend to coincide with the time axis [$\Pi(T) = 1$; no inflationary potential] but becomes a line of infinite length for every finite time interval [$\Pi(T) = \infty$; infinite inflationary potential].

In other words, as far as the economic agents have the slightest limitation in their monitoring abilities as to the inflationary policy, our Nasty Ned can select policies with an arbitrarily large inflationary potential no matter how short is the time horizon under consideration. In the limit, one gets a policy with an infinite inflationary potential, which corresponds to the extreme case in which the chosen

policy has an uncountable number of discontinuities and whose time pattern is described by a fractal line – that is, a line whose length is infinite even though it is contained in a compact subset of the two-dimensional Euclidean space (see Mandelbrot, 1982).

Notice how, as already argued in section 2, the presence of systematic uncertainty (under the form of a limitation of agents' monitoring abilities) makes the notion of rational expectations useless in our example: since the economic agents cannot monitor the policy maker's actions, they cannot react to the change in environmental conditions in any case, thus giving up unbounded, systematic profit opportunities. If they could instead monitor the policy maker's actions, they could react to an unfavourable change in environmental conditions by applying the punishment scheme in the case of an inflationary policy, thus collecting all the available profits.[8]

It must be stressed that by considering a linear 'sawtooth' shape we do not have a great loss of generality, except for the case when ε is relatively large. In this case, the use of, say, an exponentially growing 'sawtooth' shape would imply a greater inflationary potential in that the growth in $\pi(t)$ would be quicker than in the linear case. If ε is close to zero, however, the choice of the shape of the 'teeth', that is, the rate at which the single 'teeth' of the profile grow is immaterial because in the limit the shape coincides with its linear approximation.

The results above show that it is indeed possible for our Nasty Ned to get unlimited gains from a suitably chosen inflationary policy even if the monitoring ability of the economic agents, though limited, tends toward perfection and even if attention is limited to a finite subperiod. This means that there can hardly be scope for a socially optimum reputational equilibrium because the punishment scheme that the economic agents can implement, although 'quasi-capital', is in fact unable to rule out the possibility of a successful inflationary policy. Notice that the result would not change substantially if indeed Nasty Ned was boundedly rational in his presumption of being able to outsmart economic agents forever, that is, even if agents eventually realized that the costs of debt service (say) was systematically reduced in the past through an inflationary finance and therefore applied the quasi–capital punishment: in any given finite subperiod in which

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[8] Given the aggregate nature of the model, individual profit opportunities are indirectly represented here as the difference between the level of utility attained by the economic agents and their maximum attainable utility level.

Nasty Ned was actually able to outsmart economic agents, he collected arbitrarily large gains in terms of inflation, while the punishment, however big, would be at any rate limited.

It must be observed, however, that the policy described here is by no means necessarily the optimal one given the constraints a-c. In particular, it could well be that a stochastic policy with a relatively low mean rate of inflation and with occasional 'spikes' toward ε performs better than the proposed one (granted that the random variable never takes values greater or equal to ε). For a stochastic policy of this sort, a typical tradeoff exists between the safety of the policy and its inflationary potential, measured by the relative frequency of the 'spikes'. A possible extension of the model is therefore that of finding an optimal relative frequency for the spikes and to compare the optimal stochastic policy thus obtained with the deterministic one proposed here.

To conclude, it must clearly be stressed that the simple model proposed here has no particular pretence of realism, were it just for the fact that the rate of inflation is assumed to be perfectly controllable by the policy maker. It has, however, some interest in our opinion because it shows that the introduction of even quite stylized elements of realism, and in particular of systematic uncertainty, such as limitations in the monitoring abilities of the economic agents, in the formulation of a model of credibility and reputation may actually deeply alter the nature of the results and, above all, may question the empirical relevance of this kind of literature as it stands.

4. Conclusions

While it is perfectly true that issues of credibility and reputation are important in the evaluation of the performance of real life economic policies, it is nonetheless true that the economic agents' perception of the realized payoffs of a given policy, if not of the real structure of the policy game being played, is in most cases imperfect, and therefore the evaluation of the policy maker's performance cannot but be ambiguous. To take proper account of this fact is a task that is far from trivial, but nonetheless absolutely necessary for a sensible theory of economic policy. In particular, it is absolutely necessary that some degree of systematic uncertainty is introduced into the model for the sake of its empirical relevance.

This conclusion, of course, sounds very Keynesian. Fifteen years of orthodoxy of the new classical macroeconomics have led economists to take uncertainty seriously only when there was a ready made model in which it could be framed (following the methodological prescriptions of Lucas, 1980). This attitude has established a curious vicious circle, according to which economic problems are relevant only if there is a model for them. It has been argued that wisdom that cannot be captured into a model is not real wisdom. However, it has hardly been asked what sort of wisdom is the one that comes from a *wrong* model.

On the other hand, until we have a serious theory of economic policy, we should not shed many tears for policy makers. Policy making is, today as well as in the past, an art that owes little to the sophistication of formal economic models and much to the practical wisdom of policy officers, as Keynes stressed so well more than fifty years ago. Policy experiments based on a tight commitment upon a well defined analytical model have generally been tremendous failures, and this should be no surprise given the huge limitations in the empirical relevance of the available models.

We end the paper with some tentative proposals for a positive theory of credibility and reputation in economic policy making. Rational expectations models placed a major emphasis on the interaction between the policy maker and economic agents as if the policy game happened in a void. In fact, a realistic approach requires that every sensible policy problem is framed into a proper institutional context, possibly a relatively detailed one. A normative evaluation of the behavior of both the policy maker and the economic agents (and therefore statements about their 'rationality') must necessarily be context-dependent in the presence of systematic uncertainty (on this Sacco, 1990b).

To be more specific, take the reputational issues considered in this paper. The credibility of a policy, the reputation of a policy maker are largely affected by the reputation of the institution with which the policy maker is identified by the public. A policy maker may have no incentive to look for the consensus of economic agents, if he is in charge for a limited time and agents have no veto power on his actions. But the institution with which he is identified must look for consensus, or at least for social legitimation. Therefore, if viewed

from the institution's point of view, the problem of whether to inflate the economy may look different than from the policy maker's point of view. The institution could in some situations deliberately give up the possibility of inflating the economy if this strategy is likely to undermine its social legitimation in the long run. In this case, the existence of limitations in the monitoring abilities of the economic agents might not be critical for the establishment of reputation: for example, the policy institution could decide to 'tie his hands' by making his policy choices perfectly observable in order to enhance or just to establish its social legitimation. One could also introduce more radical forms of systematic uncertainty than imperfections in the monitoring abilities of economic agents. It is far from obvious that in a context of more substantial uncertainty the policy game must have a noncooperative nature.

Even in the noncooperative case, however, the mechanisms of social consensus may act as binding constraints on the policy maker's choices. Under systematic uncertainty, workers and entrepreneurs tend naturally to attach a greater weight upon those particular costs and benefits of policy options that are exactly quantifiable rather than upon those whose exact quantification is ambiguous, and this independently from their magnitude. This can constrain heavily the range of policy options that are socially sustainable. Think for example of the increasing difficulties experienced in modern developed economies as to the agreement on the terms of mass work contracts. In the case of systematic uncertainty in which there is no clear perception by workers and entrepreneurs (or even by policy makers) about the real policy tradeoffs, the social legitimation of policy making institutions can be undermined if they are not able to guarantee a certain minimum level of employment and/or real wages, and a certain level of profitability for firms, and this irrespectively of the real costs of these measures (e.g. in terms of budget deficit), that are largely discounted by the public because of the uncertainty.

It is indeed reasonable to conjecture that the higher the degree of systematic uncertainty, the more problematic the social legitimation for policy making institutions, the more binding the social consensus constraints and therefore the more limited the range of effective policy choices for the policy maker.

It is clear that a rigorous theoretical analysis in a realistic institutional framework brings about remarkable difficulties. Worst of all, modern economic theory does not seem to be equipped for this task at the moment. It is our opinion that as long as economic institutions will not find a proper (central) place within economic models, the 'serious' theory of economic policy (that is, the one really used for policy decisions) will remain a private matter of policy officers. If economics has to be an useful science, this is a challenge that cannot be dismissed.

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