Uncertainty in Macro-Economics: A Comment

by Christian de Boissieu*

The role of uncertainty in macro-economic theories, controversies and policies is a timely and very important subject. Professor von Furstenberg's paper gives a profound and well-informed presentation. His survey is not dogmatic at all. On the contrary, useful bridges are proposed between competing perspectives, and the conclusions are documented and open to discussion. I agree completely with the general diagnosis, namely that the current treatment of uncertainty in macro-economic models is inadequate and that this situation has crucial implications at the policy level. I will pick out a few points for discussion.

1.) Nearly half of the paper is devoted to aggregation problems, and topics which are related to it ("representative-agent" models, the micro-economic foundations of macro-economics, etc.). To be sure, spatial and intertemporal aggregation is an important dimension of the subject, since it both increases uncertainty (by inducing a loss of information) and may reduce it. This observation leads to the concept of "optimum" aggregation level and procedure. Even if aggregation is crucial, some other issues deserve interest.

a) How to compare uncertainty in open macro-economics to the uncertainty introduced in macro-analyses designed for closed economies? Opening the economy means new constraints and additional sources of "shocks" and uncertainty for policy-makers. Let us take two examples to document this point:

- W. Poole's model about the choice of the instrument (or the intermediate target) under uncertainty, originally designed for a closed economy, leads in general to different conclusions when extended to the open-economy case (see for instance J. Melitz's paper [9]).

- The contemporaneous puzzle about the evolution of the velocity of money can be, in some cases, partially solved by taking into account imports and exports and the impact of trade balance on the demand for money (for the velocity of M1 in the U.S., see L. Radecki and J. Wenninger [10]).

In an open economy uncertainty depends crucially on the institutional arrangements (the monetary standard, the exchange rate regime, etc.) and their economic implications.

* Professor of economics, University of Paris I (Panthéon-Sorbonne).

b) How to analyze the relations between money and uncertainty? The paper rightly refers to the increasing difficulties in defining monetary aggregates and indicators of monetary policy. We come back here to traditional controversies concerning the stability of money-demand equations. Another perspective, in the line of some post-keynesian studies, would focus on more “fundamental” relations between money and uncertainty. On the one hand, money as a medium of exchange creates some kind of uncertainty for the transactors: each agent is only informed about the actual supplies or demands by the others. He has no direct information concerning their “notional” supplies or demands (see the well-known “dual-decision” model presented by R. Clower [2]). The uncertainty generated by the medium-of-exchange aspect of money is embodied in the concept of “effective demand”, so central in Keynes’ *General Theory*. On the other hand, money is also for individuals, firms, etc., a means to cope with uncertainty, as is well-illustrated by the keynesian liquidity preference theory. Like money, financial assets and markets have a dual impact on uncertainty. They introduced many uncertainties (interest rate risk, exchange rate risk, etc.), which can be covered at the individual level (swaps, options, financial futures...) but remain in the system through a redistribution from risk-averse individuals to risk-lovers. On the other side, money and financial assets are “buffer-stocks”, which are used to smoothe the consumption pattern, in case of a long decision horizon (e.g., in “life-cycle” models) or in case of an unexpected involuntary unemployment (see the “corridor”, introduced by A. Leijonhufvud [6] in order to stylize the role of money and financial assets in a situation of excess supply on the labour market).

2.) The sources of uncertainty are manifold and present at the different stages of the economic analysis: the measurement, the modelisation, the use of the model to interpret the facts (the “positive” aspect) and to draw policy implications (the normative aspect). The development of a stochastic macro-economics has been rapid over the last five years. One notable field of application is represented by disequilibrium theory. Even at a global level (i.e., with only *one* goods market and *one* labour market), we cannot assert for sure that we are in a regime of classical unemployment, keynesian unemployment, underconsumption, etc. (to use the well-known typology presented by E. Malinvaud [7]). All we can assess are the probabilities of being in such or such a regime. The imprecision comes not only from the theory, but also from the techniques of estimation for markets under disequilibrium. When we pass from the global to a disaggregated level (*m* goods markets and *n* labour markets), we have a stochastic approach since the frequency of sectors in keynesian unemployment (or in classical unemployment...) is naturally interpreted as a probability (E. Malinvaud [8]).

3.) The treatment of uncertainty and risk in economic analysis is fundamentally dependent on the nature of the economic science. Economists have favoured risk as opposed to the true uncertainty defined by F. Knight [5], and have abused of certainty-equivalence theorems. The extensive recourse to *additive* uncertainty (uncertainty concerning the constants of the equations), the treatment of uncertainty in the Arrow-Debreu model through the concept of contingent goods (see chapter 7 of G. Debreu [3]), and many other examples illustrate the certainty-equivalence bias of dominant analyses. From the theory of economic policy, we learn that *multiplier* uncertainty (i.e., uncertainty about the values of the parameters associated to the explanatory variables) has radically different implications

for economic policy as compared to additive uncertainty (see W. Brainard [1]). To be sure, multiplier uncertainty introduces a lot of technical puzzles (estimation procedures...) But some consistency is required: we cannot in the same time claim that multipliers are non-stochastic and well-known by the economic agents and the observer, and pretend that they represent behavioural coefficients endogeneous to the environment, especially to current and expected economic policy (the Lucas critique).

Economists who have tried to reject the certainty-equivalence approach on a *a priori* basis, like G. Shackle or P. Davidson, have been wrongly reintegrated in the mainstream or considered as people working at the border of the field. For instance, many economists and statisticians were keen to demonstrate that Shackle's concept of "potential surprise" can be related to the classical calculus of probability, a demonstration rejected by Shackle himself. By definition, it is more difficult to analyse the true uncertainty, but the high stake warrants new trials.

4.) Risk analysis plays a key role in the investment decision process, as is well illustrated by the Tobin's (q) or by the related notion of "profitability". In the present circumstances, firms have great difficulty to anticipate global or sectoral demand, and they rely increasingly on the comparison between the expected return on capital goods and the expected return on financial assets. This comparison, which underlies the measure of the profitability of capitals goods, has been over the last five years, in many cases, in favour of financial instruments. Due to the interest rate "configuration", namely the high level of real rates and the expected and actual drop in nominal rates, many entrepreneurs have been led to underestimate financial risks as compared to "competitive" risks (risks on industrial or commercial investments). Overestimation of competitive risks is still highly detrimental to investment in physical assets, and the increasing role of risk premia may explain, at least partially, the low elasticity of investment to increases in profit margins that we observe in many countries, for instance in France in the period 1983-1987¹.

5.) The relation between uncertainty and economic policy is more complex than it is generally assumed. On the one hand, uncertainty represents a challenge to the conduct and the implementation of economic policy. On the other hand, uncertainty can be used, in certain circumstances, as a tool of economic policy and as the means to maintain its effectiveness.

a) Three major closely related macro-economic controversies illustrate the importance of uncertainty:

- the "rules vs discretion" debate. Rules without feedback have been justified by the uncertainty about the lag structure or the channels of economic policy (M. Friedman), and more recently by the ineffectiveness of the systematic component of economic policy (the New Classical Macro-economics).
- the "activism vs conservatism" debate, which is another aspect of the preceding controversy. According to W. Brainard's conclusions, multiplier uncertainty must lead, for risk-averse policy-makers, to diversification of instruments and moderate interventions.

¹ The necessity for french firms to diminish their rate of indebttness has also played an important role: increases in profits were used first to refund debts accumulated during the seventies.

– the “gradualism vs shock-therapy” debate. Here, several arguments may converge in favour of a gradual policy: the uncertainty about the economic structure (the mathematical specification of the equations, the values of the multipliers, etc.), about policy lags or the channels of policy,...

Monetary policy represents an important and topical application for macro-economic controversies. Diversification of instruments and precautionary actions by the monetary authorities have many justifications: the increasing instability in the money-demand functions due to financial innovation and marked changes in the rate of inflation; the persistent uncertainty concerning the respective price- and quantity-effects of monetary policy, etc.

Goodhart’s law, which constitutes an application of the Lucas critique, summarizes several warnings addressed to the policy-makers: any statistical regularity (e.g., between the money stock and nominal GDP) loosens, or even vanishes as soon as it is used for policy purposes. The failure of intermediate target policy in many OECD countries confirms the validity of the law. Several challenges facing monetary authorities come from the gap between their imperfect knowledge of underlying economic structures and their ambitious goals. Given the numerous structural uncertainties, they are obliged, as is well illustrated by Goodhart’s law, to downgrade their ambition.

b) In certain circumstances, uncertainty is also a tool of economic policy. Since the systematic component of monetary policy has no real effects in the world studied by the New Classical Macro-economics (rational expectations and totally flexible prices), the only means for monetary policy to remain effective in this case is to resort to surprise effects (the random component). A well-known application of this general proposition is analyzed by S. Fischer [4]: monetary policy is not neutral in a rational expectations world, provided that the revision lag of policy is shorter than the revision lag of wage contracts. The gap between the two lags means that the monetary authorities are in a position to “surprise” wage-earners. We don’t want to insinuate that a purely random monetary policy would be, in a flex-price and rational expectations environment, the first best, or even a “second-best”. We only want to underline that the rational expectations argument, when extended to the behaviour of policy-makers, naturally leads to a game-theoretic presentation with the usual ingredients of the games of strategy: possibility for the players and high incentives to cheat, to manipulate (see the fashionable concept of “manipulative Nash equilibrium”), etc. The recent and relevant works on the policy coordination issue are framed in a game-theoretic setting. They study among other aspects the relations between uncertainty and notions like “reputation” and “credibility” which condition the efficacy of economic policy.

c) Insurance is a way to reduce uncertainty at the micro level, to redistribute it at the global level. Too much insurance can be detrimental to the dynamic stability of the system, for at least two reasons: 1/ over a certain threshold, certainty and insurance lead to the well-known moral hazard problem. For instance, it is quite impossible to control the growth of the money stock in a situation where commercial banks are certain that the “lender of last resort” would in any case intervene. 2/ We have just seen that, in certain circumstances, “surprise effects” created by policy-makers are required to keep some effectiveness for policy interventions and then, perhaps, to reduce spontaneous economic fluctuations.

On the other hand, too much uncertainty may generate instability. For instance, several forms of insurance (deposit insurance, interventions by “lenders of last resort”, etc.) are crucial for maintaining the confidence of private agents and avoiding runs on banks.

In a dynamic framework, taking into account the several aspects of the “time-consistency” problem, it would be important to isolate the “negative” (i.e., destabilizing) uncertainty from the “positive” one. Even if, on a theoretical ground, the very notion of optimal uncertainty (or insurance) is highly conditioned by the reference model, recent events in the financial sphere, at the domestic and at the international level, suggest that policy-makers have to be very cautious when they manipulate the “positive” and “negative” components of uncertainty.

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