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INFLATION,
THE QUANTITY THEORY,
AND RATIONAL
EXPECTATIONS

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NORTH-HOLLAND

Inflation, the Quantity Theory, and Rational Expectations

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INFLATION,
THE QUANTITY THEORY,
AND RATIONAL EXPECTATIONS

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INTRODUCTION TO THE SERIES

This series publishes books of interest to students and researchers working in the fields of macro-economics, monetary theory and policy, banking and the operation of financial markets. It is intended that works of empirical emphasis will be included in the series along with theoretical contributions. Publications will include research monographs and the proceedings of significant conferences. The editor welcomes submissions of manuscripts for inclusion in the series.

to Janneke

'Wage rates, productivity, profits; that is what we should be discussing instead of all this nonsense about money supply.'

Roy Harrod

'You can reconstruct macro-models by paying a little more attention to the supply side and get a reasonable account of the 1970s.'

Robert Solow

'Inflation is always and everywhere a monetary phenomenon.'

Milton Friedman

'Existing Keynesian macroeconomic models are incapable of providing reliable guidance in formulating monetary, fiscal and other types of policy ...there is no hope that minor or even major modifications of these models will lead to significant improvement in their reliability.'

*Robert Lucas
Thomas Sargent*

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Eduard J. Bomhoff

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Chapter 1

AN ECONOMIC THEORY OF INFLATION

1.1. INTRODUCTION

Not so long ago, inflation was simply regarded as the consequence of too much money chasing too few goods. Economists in the 1920's generally accepted the quantity theory of money (Maier, 1978), and the single term "inflation" was used both to describe a persistent rise in the general level of prices and to denote increases in the volume of money in circulation:

"When I began studying economics at the University of Vienna, immediately after the First World War, we were having a rapid increase of prices in Austria and, when asked what the cause was, we said it was inflation! By inflation we meant the increase in that thing which many are now are afraid to mention -- the quantity of money."

(Machlup, 1972, p. 26).

The present study fits in that old tradition. It reaches the same conclusion as Machlup and his fellow-students half a century ago: a continuous rise in prices is caused by a similar increase in the quantity of money. However, the argumentation is different and is based on recent advances in economic theory and statistical methodology.

The whole corpus of economic theory and econometric practice is currently being overhauled as economists try, with more consistency than before, to apply one of the basic principles of their science, that of economic rationality. The assumption that people behave rationally has always been

"economics' main export commodity to the other social sciences" (Simon, 1978a, p. 4). At the same time, the profession itself has often violated the rationality postulate, particularly in the field of modelling expectations. Not as a matter of principle, but for statistical and analytical convenience (Nerlove, 1967, p. 128), economists preferred adaptive expectations or other simple forecasting schemes that were selected on a priori grounds without considering whether these mechanical formulas provided rational predictions. A much-needed innovation has been provided by the time-series techniques of Box and Jenkins (1970), so that modern theoretical insights, for example in the relation between money and prices under rational expectations (Brock, 1972, 1974), can now be implemented empirically.

It is sometimes claimed that quantity theorists hold an extreme view about price flexibility because they assume that a change in one relative price, e.g. the price of coffee, will lead to a decrease in real balances, and thus to a fall in other prices, so that an aggregate price index does not necessarily have to go up. In the models of chapters 2 - 4, however, we shall postulate proportionality, not between the stock of money and the price level, but only between the expected rate of money growth and the expected rate of inflation. Allowance will be made for temporary discrepancies between expected and actual rates of price change, so that relative price changes can have short-term effects on an aggregate price index.

We shall assume that economic agents are rational and capable of distinguishing between changes in the "underlying" rate of inflation on the one hand and accidental one-time changes in the price level on the other. This distinction is lost in models that base expectations of inflation partly or wholly on past rates of price change (for example: Sargent, 1976c, 1977a). In such models, a rise in the price of coffee not only affects the current rate of price change but also the rate of inflation in all future periods. Such an outcome is truly extreme, unless we make particular assumptions about wage-price behaviour and about a completely passive monetary

policy. The alternative hypothesis, on which the present study will focus, is that agents know the difference between transitory "blips" in a price index and movements in the sustained rate of inflation. It follows that one cannot model their inflationary expectations by a weighted average of actual past rates of price change. Instead, these inflationary expectations will be based on expectations about future growth of the money stock.

The question of how to calculate inflationary expectations would not arise, of course, with a theory of inflation that does not require expectations at all. Such a theory does indeed exist and is popular with some economists. According to this theory (sometimes called neo-Keynesian), trade unions are sufficiently powerful to determine the rate of wage inflation. Entrepreneurs then try to protect their profits by increasing prices. The monetary authorities accommodate by supplying enough money to finance the necessary increase in nominal demand, because a non-accommodating monetary policy would cause unemployment:

"Wage rates, productivity, profits; that is what we should be discussing around this table instead of all this nonsense about money supply."

(Harrod, 1972b, p. 99).

Such a view of inflation assigns substantial power to trade unions to fix wages and to entrepreneurs to set prices. Changes in the power of these groups then cause changes in the rate of inflation. Problems with the definition and measurement of economic power (Barry, 1976, and Anderson, 1978) and the fact that

"there is a great deal to suggest that many unions normally operate with an unused margin of monopoly power"

(Brittan, 1978, p. 174),

mean that various untestable ad-hoc hypotheses are usually needed to "explain" why the rate of inflation goes up or down.

The difficulty with this approach is not that it transcends the boundaries of economic science. No explanation of *why* inflation happens can be purely economic; one based on the

quantity theory is no exception.

"Economic factors, and they alone, can explain how inflation happens, but economic factors alone cannot explain why."

(Hirsch, 1978, p. 263).

However, the power-theory of inflation also rejects economic analysis as useless for the question *how* inflation happens. Its followers stress the new and sociological aspects of the current inflation as a double excuse for not stating empirically refutable hypotheses. Harrod claims:

"This new wage-price explosion is altogether unprecedented, and my own opinion is that the causes are sociological."
(1972a, p. 44).

Wiles states:

"I incline to put much the larger weight on *less strictly economic factors*. It is, surely, the communications revolution which, making everyone instantly aware of everything, has sharply increased the amount of envy and imitation in the world, and reduced the number of things that are sacrosanct. We have moved from wage claims based on the actual situation in the trade through claims based on concessions made elsewhere in the economy to claims picked out of the air."
(1973, p. 378).

The present study is limited to the question *how* inflation happens, and its aim is to investigate what economic analysis, founded on the assumption of rational behaviour, can contribute. Only when choice-theoretic assumptions have failed to account for the evidence, should the scientist be prepared to resort to other explanations that are more ad-hoc and thus have lower predictive power. As far as the post-war inflation in the U.S. and the Netherlands is concerned, this will not be necessary since the economic theory that we shall employ will survive a confrontation with the data.

In the following three sections, we shall take up first why the assumption of rational behaviour is such a vital one

for the economist (section 1.2.); second, why it should certainly be applied to the formulation of expectations (section 1.3.); and third, how the Box-Jenkins technique can help to calculate empirical proxies for rational expectations (section 1.4.). An attempt will then be made in chapters 2 - 4, to revisit the quantity theory with strict application of the principle of rationality.

1.2. RATIONAL BEHAVIOUR

Throughout this study, we shall assume that economic subjects act rationally and form their expectations about the future in a rational manner. Strict application of this principle is still unusual in economic research and tends to be met with strong objections. We shall therefore postpone technical comments about the ways in which rational expectations can be modelled until the next section, and first try to explain why the assumption of rationality has been made.

Economic science formulates and tests hypotheses about individual human action that can be derived from inter-temporal optimizing processes, under the assumption that the maximand is given. The use of such optimization techniques is what is meant by the assumption of economic rationality. The question whether much or little of man's purposeful behaviour can be fruitfully studied in this way and with it the question whether man acts rationally in the economic sense becomes an empirical issue. Hypothesis testing will show the "coverage" of the rationality assumption and should guard economists from economic solipsism.

Experience so far has indicated that in contemporary society important aspects of many activities are amenable to economic analysis (and thus to the automatically implied assumption of rational behaviour).

According to Godelier (1966):

"The more complex the division of labour, the more do

economic activities acquire relative autonomy in the social totality and the easier is it to define elementary economic categories, that is, categories and laws that are "simply" economic. Contrariwise, the simpler a society is, the less possible is it to isolate the economic from the other elements in social life, and the more complex will be the analysis of an apparently economic mechanism, since the entire social configuration is directly present at the heart of this mechanism."

(p. 302 of the English translation).

Also, according to Sahlins (1976, p.p. 212-213):

"Not only is Western civilization characterized by the structural separation of functional spheres, but all are subordinated to the requirements of the economy, (whereas) in primitive society, economic, political, and ritual action are organized by the one generalized kinship structure

The two cultural orders elevate certain institutional relations to a position of dominance, as the site from which the symbolic grid is precipitated and the code objectified. In bourgeois society, material production is the dominant locus of symbolic production; in primitive society it is the set of social (kinship) relations. (C)apitalist production is as much as any other economic system a cultural specification and not merely a natural-material activity; for as it is the means of a total mode of life it is necessarily the production of symbolic significance. Nevertheless, because it appears to the producer as a quest for pecuniary gain, and to the consumer as an acquisition of "useful" goods, the basic symbolic character of the process goes on entirely behind the backs of the participants -- and usually of economists as well, insofar as the meaningful structure of demand is an exogenous "given" of their analyses The reasoning is simple and *violates no conventional understanding of the capitalist process*" (emphasis added).