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## PART TWO

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# Allais's Theory of "Expectations" Under Uncertainty

THE HRL FORMULATION we are going to present in part II of this book, and to transpose in Part III to financial behavior, is originally one element of Allais's theory of monetary dynamics. To fully appreciate what the HRL formulation is liable to bring to the modeling of financial behavior, it is necessary to give an overview of Allais's theory of monetary dynamics. This is not a minor challenge since it implies summarizing 50 years of research and a 1300-page book in a few pages.<sup>1</sup> Since this exercise is meant to be an overview, it will be limited to presenting Allais's assumptions and conclusions; the sometimes long proofs leading from the former to the latter are given at the end of this book (in any case, all these proofs are gathered in *Fondements de la dynamique monétaire*). Nevertheless, in a few instances (e.g., formulation of elasticities), this book presents brief original demonstrations in its main text to facilitate the understanding of some aspects of Allais's theory of monetary dynamics.

In the course of this exercise, we are going to meet Cagan's work on hyperinflation.<sup>2</sup> Allais and Cagan worked independently of each other. But, at the same point in time (1953–54), it happened that their respective research efforts converged. Both used the same mathematical formulation, namely, exponential averages, to model the argument of their respective demand for money functions. But they later parted ways, as Allais was led to his HRL formulation thanks to his analysis of the shortcomings of simple exponential averages.

As Cagan's work is a reference in the English-speaking world and as Allais's HRL formulation can be considered to be an enhancement of their mid-1950s common approach, it will be useful, too, to compare

the HRL formulation with Cagan's formulation.<sup>3</sup> When inflation becomes high relative to real growth, Allais's model becomes indeed a hyperinflation model liable to be directly compared with Cagan's model.

Allais's seminal economic experience was the Great Depression, which he witnessed as a student during an internship in the United States in 1932–33, when he was aged 21. He was so shocked by what he then saw—"large quantities of unemployed resources when so many human wants were left unsatisfied"—that he set for himself the objective of understanding the mechanisms at work in such circumstances.

This objective led Allais to construct step by step a set of analytical tools, which constitute a very original, structured, and comprehensive contribution to dynamic monetary macroeconomics, a construction that is not Keynesian, monetarist, or neoclassical. The HRL formulation of the demand for money is only one of these tools, albeit probably the most important one. Allais's contributions to monetary macroeconomics can be classified in six blocks, three of them being logically independent of the HRL formulation of the demand for money:

- The establishment—through the aggregation of the cash flow statements of individual businesses—of the accounting identities linking, in static terms, nominal macroeconomic variables, including transactions on securities, bank credit, and money (chapter 3).
- The endogenous generation of cyclical fluctuations in aggregate nominal spending by a stylized model in which the driving factor is the gap between the supply of and the demand for money, both of them being nonlinear, bounded, but analytically not specified functions, the former increasing, the latter decreasing with respect to nominal growth (chapter 3).
- The HRL formulation of the demand for money, according to which the ratio of desired money-to-aggregate nominal spending is a logistic decreasing function of the present value of past growth rates in nominal spending (chapter 4).
- The fundamental equation of monetary dynamics (FEMD), which introduces the gap between desired and effective money balances in the differential expression of the Newcomb-Fisher equation of exchanges and shows this gap to be the factor explaining the variability of money velocity (chapter 5).

- The HRL formulation of monetary dynamics, which analyzes the various theoretical types of endogenous fluctuations in aggregate nominal spending that the fundamental equation of monetary dynamics can generate, when the demand for and the supply of money are assumed to obey the HRL formulation (chapter 5).
- The simultaneous testing of the compatibility of both the HRL formulation of the demand for money and the fundamental equation of monetary dynamics with empirical data (chapter 6).

