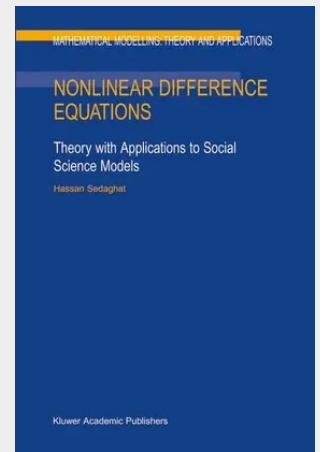


Nonlinear Difference Equations

Theory with Applications to Social Science Models

It is generally acknowledged that deterministic formulations of dynamical phenomena in the social sciences need to be treated differently from similar formulations in the natural sciences. Social science phenomena typically defy precise measurements or data collection that are comparable in accuracy and detail to those in the natural sciences. Consequently, a deterministic model is rarely expected to yield a precise description of the actual phenomenon being modelled. Nevertheless, as may be inferred from a study of the models discussed in this book, the qualitative analysis of deterministic models has an important role to play in understanding the fundamental mechanisms behind social science phenomena. The reach of such analysis extends far beyond technical clarifications of classical theories that were generally expressed in imprecise literary prose. The inherent lack of precise knowledge in the social sciences is a fundamental trait that must be distinguished from "uncertainty." For instance, in mathematically modelling the stock market, uncertainty is a prime and indispensable component of a model. Indeed, in the stock market, the rules are specifically designed to make prediction impossible or at least very difficult. On the other hand, understanding concepts such as the "business cycle" involves economic and social mechanisms that are very different from the rules of the stock market. Here, far from seeking unpredictability, the intention of the modeller is a scientific one, i. e.

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