

# Preface

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In this book, we have connected insights from several theoretical traditions in economics—primarily from within the fields of urban and financial economics within mainstream thought as well as more disruptive theories from Austrian and institutional economics—with concepts and theories from applied mathematics, biology, chemistry, economic history, philosophy, physics, political science, psychology and sociology.

The most important among these heterogeneous and multidisciplinary inputs is the subdivision of time into *multiple timescales* as has been proposed in synergetics, with many notable scientific applications such as autocatalytic processes in chemistry. A second key idea is to see all goods and resources as more or less *durable* and thus as *capital* as first proposed by Frank Knight. An implication of our framework is that fundamental (or structural) uncertainty becomes something that we must address. A further implication is that we cannot assume that capital can be easily aggregated, as in standard bookkeeping practice. The value of any aggregation of capital then becomes an emergent property of the activities of uncertainty-bearing entrepreneurs. The firms that entrepreneurs create and organize are to be valued in various markets—notably equity and real estate markets—according to investors' assessments of their expected and uncertain returns. Following Knight, we also regard this type of assessment as an instance of entrepreneurial judgment, even though of a type that expands rather than initiates profit-seeking firms.

We have been able to unite and bring to fruition the variegated ideas and concepts that we draw upon by making extensive use of the theory of synergetics, which was developed originally in the context of natural science by Hermann Haken of the University of Stuttgart. This theory makes it possible to reformulate economic processes as consisting of variables that fall into (at least) four possible categories. We achieve this by simultaneously considering the timescale (speed of change) and the domain of a variable. We term those variables that are relatively stable—that is, change at a slow pace—and affect an inclusive and collective domain the *infrastructure* of a spatially delimited region. With this approach it is possible to construct a theory of economic development that is of general applicability. In short, conventional market interactions are akin to games that people play on an

infrastructural “arena.” This arena comprises scientific and other widely shared knowledge; transport, communication and utility networks; and the set of formal and informal institutions that constrain individual behavior and individual expectations.

This book is the end result of a long-term collaborative effort between the two of us and with colleagues from several academic disciplines. We have been inspired by discussions that one or both of us have had over the past decades with—in alphabetical order—Nurit Alfasi, Martin Andersson, Brian Arthur, Roland Artle, Jean-Pierre Aubin, Chris Barrett, David Batten, Martin Beckmann, Bruce Benson, Paolo Bianchi, David Boyce, Bill Butos, Gene Callahan, Troy Camplin, John Casti, Lata Chatterjee, Paul Cheshire, Chor-yung Cheung, Benoit Desmarchelier, Pierre Desrochers, Gus diZerega, Laurent Dobuzinskis, Lenore Ealy, Finn Førsund, Masahisa Fujita, Peter Gärdenfors, Kenneth Gibb, Michael Goldberg, Peter Gordon, Saileshingh Gunessee, Trygve Haavelmo, Hermann Haken, Joshua Hall, Lauren Hall, David Hardwick, Björn Hårsman, Randall Holcombe, Rogers Hollingsworth, Chiang-i Hua, Marek Hudik, Leo Hurwicz, Sanford Ikeda, Walter Isard, Börje Johansson, Rune Jungen, Anders Karlkvist, Charlie Karlsson, Wolfgang Kasper, Nathan Keyfitz, Kiyoshi Kobayashi, Bob Kuenne, Lawrence Wai-Chung Lai, T.R. Lakshmanan, Leonard Liggio, Heikki Loikkanen, Johan Lönnroth, Qing-Ping Ma, Benoit Mandelbrot, Leslie Marsh, Christian Wichmann Matthiessen, Stefano Moroni, Anna Nagurney, Peter Nijkamp, Lars Göran Nilsson, Åke Nygren, Tomas Ohlin, Olle Persson, Jason Potts, Tõnu Puu, John Quigley, Donald Saari, Nils-Eric Sahlin, Oliver F. Shyr, Dean Simonton, Gudmund Smith, Tony E. Smith, Folke Snickars, Jack Sommer, Ulf Strömquist, Daniel Sutter, Peter Sylwan, Gunnar Törnqvist, Frederick Turner, Pravin Varayia, Aidan Walsh, Wolfgang Weidlich, Weibin Zhang and Gloria Zúñiga y Postigo. The usual caveats apply.

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