Contemporary Systems Thinking

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Currency Wars

Offense and Defense through Systemic Thinking

Springer

Contemporary Systems Thinking

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ISSN 1568-2846
Contemporary Systems Thinking
ISBN 978-3-319-67764-4 ISBN 978-3-319-67765-1 (eBook)
https://doi.org/10.1007/978-3-319-67765-1

Library of Congress Control Number: 2017953191

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer International Publishing AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Synopsis

Based on the concept of two-dimensional science, consisting of the classical science, the first dimension, and the systems science, the second dimension, as argued by George Klir in the 1990s, this book systematically presents how the recent systemic yoyo model, its thinking logic, and its methodology can be employed as a common playground and intuition to the study of money, international finance, and economic reforms.

After the introduction of the relevant historical grounds, this volume consists of six parts. The first part addresses issues related to systemic modeling of economic entities and processes; why a few policy changes could adjust the performance of the extremely complex economy, although such practice has been in use for decades with varying degrees of successes; and how to practically estimate the true state of the economy through using either observers or controllers. The second part investigates the problem of how instabilities lead to opportunities for currency attacks, the positive and negative effects of foreign capital, how international capital flows can cause disturbances of various degrees on a nation's economic security, and what could be done to reduce the severity of the disturbances to the minimum. The third part addresses how a currency war is initiated, why currency conflicts and wars are inevitable, and a specific way of how currency attacks can take place. The fourth part shows how one nation can potentially defend itself by manipulating the exchange rate of its currency and how the nation under siege can protect itself against financial attacks by using strategies based on the technique of feedback and develops a more general approach of self-defense. The fifth part addresses issues related to the cleanup of the disastrous aftermath of currency attacks through using policies and reforms. The sixth part analyzes specific cases, where in particular what is addressed includes a look at Renminbi as a new reserve currency and what China is doing to strengthen Renminbi's influence in the world finance, where the euro, the US dollar, and the Chinese Yuan will go in the coming years. Then Chap. 24 concludes the presentation of this book by addressing the ultimate problem of whether or not currency wars can be avoided altogether.

By looking at the issues of monetary movement around the world, this book shows that there are clearly visible patterns behind the flows of capital and that there are a uniform language and logic of reasoning that can be powerfully employed in the studies of international finance. By making use of the patterns and by employing the language and logic of thinking, one can produce interesting, convincing, and scientifically sound results. As shown in this book, many of the conclusions drawn on the basis of these visible patterns, language, and logic of thinking can be practically applied to produce tangible economic benefits.

By studying this book, the reader will walk away with a brand new tool to attack his or her problems and a collection of practically useful knowledge and conclusions.

Preface

Money connects people through exchanges of goods and services. It associates nations through trades. And because of the rapid advancement of modern technology, the circulation speed of money has been accelerating, making the originally separate and even isolated economies from different parts of the world amalgamate into one giant, complex economic system. This globalization has helped to create previously unimaginable amount of wealth. At the same time, it has also brought forward adverse effects, such as, among others, worsening severe uneven distribution of wealth and frequent occurrence of disastrous financial crises. It is these adverse side effects of the globalization that this book addresses.

Speaking differently, because of the development of international trades and markets, an integrated environment for a world economy has been created. So, events that take place in the financial market of one nation could produce and have produced magnificent impacts on the financial markets of other nations. For example, a regional subprime mortgage crisis of the United States in 2008 quickly escalated into a full-blown financial crisis with all major economies of the world involved. As the movement speed of money increases and as more and more barricades that affect the smooth transactions of money are removed, once distant economic systems are now interacting with each other in an unprecedented fashion. Therefore, implementations of monetary policies of various scales have become the core of debate on monetary policies among central bankers. Constant theoretical refinement and new understandings of money have forever sharpened our comprehension on the role of money in economy.

Through exploring systemic modeling of economic entities and processes, how economic instability could potentially lead to financial vulnerability, how policy observability could be limited so that opportunities for currency attacks are presented, what self-defense strategies could be developed, and how disastrous consequences of economic crises could be cleaned up through policies and reforms, this book addresses many theoretically important and practical significant issues related to money and its movement, estimate of the true state of the economy, economic security, design of economic policies, and economic reforms. The

purpose of this book is to establish a new unified analytical framework and logic of economic thinking on the basis of systems thinking in general and control-theory models in particular for studying money and related matters.

The novelty of the approach used in this book is treating the movement of money as that of fluid, which is rigorously backed up with recent results established in systems science. On the basis of this theoretical realization on flows of money, methods of systems science can be readily employed to model economic entities and processes, each of which is conceptually seen as an input-output system. That is, this book enriches the existing literature not only by providing a brand new instrument of intuition, which has been badly needed in the study of social science, establishing new understandings on international hot money and related policy issues, but also by introducing a whole set of new tools for rigorous reasoning and theoretical analysis of economic issues and financial events.

On top of the newly established intuition, the new tools of reasoning have enabled us to investigate many problems that have been extremely difficult, if not impossible, to address previously and establish many theoretically important and practically significant results. For example:

- Although there are a large number of factors that affect the performance of the economy, it seems to be generally possible for policy makers to simply tweak a few of them to alter the direction of economic development. This empirical experience is now theoretically backed up with rigorous proofs.
- In recent decades, financial crises had time after time again wiped out the wealth, accumulated through years of diligence and discipline, of the hardworking people, while each of these crises had shown traces of play of speculative hot money. So, a natural question is: Can the maturity of the financial system help the nation dodge financial attacks? To this end, our result shows that any economic system, regardless of the maturity of its financial system, is vulnerable to financial attacks. This result theoretically confirms the empirical claim of the raiders of the late 1970s and early 1980s that if they want, they can attack any business entity (*When Giants Stumble*, by R. Sobel (1999), Prentice Hall, pp. 165–188).
- Is it possible for an emerging market economy to design a quickest path of financial reform in order to avoid potential crises and to minimize the disastrous aftermath of crises when the nation attempts to emerge into the process of economic globalization and financial integration? To this end, this book provides necessary conditions for the steepest financial reform path problem with variable boundaries.

As applications of what is first established theoretically, this book also features particular case studies on the US dollar, the euro, and the Renminbi while providing predictions on their respective futures.

Considering its unconventional theoretical foundation and thought-provoking conclusions, other than delivering a brand new theory on international hot money, fiscal and monetary policies, and a scientifically sound methodology, this book is expected to provide practically meaningful guidance for meeting challenges that

appear in the development of international finance and economic globalization. It is our hope that you, the reader, will benefit from reading this book and referencing this book time and again in your professional endeavors. At the same time, we love to hear from you no matter what comments or suggestions you might have. The first author, Jeffrey Yi-Lin Forrest, can be reached at either Jeffrey.forrest@sru.edu or Jeffrey.forrest@yahoo.com; the second author, Yirong Ying, can be reached at yingyirong@sina.com; and the third author, Zaiwu Gong, can be reached at zwgong26@163.com.

Fasten your seat belt; we are now entering a previously unexplored territory in the world of learning!

Slippery Rock, PA, USA — Jeffrey Yi-Lin Forrest
Shanghai, China — Yirong Ying
Nanjing, China — Zaiwu Gong
March 6, 2017

Acknowledgments

This book contains many research results previously published in various sources, and we are grateful to the copyright owners for permitting us to use the material. They include the International Association for Cybernetics (Namur, Belgium), Gordon and Breach Science Publishers (Yverdon, Switzerland, and New York), Hemisphere (New York), International Federation for Systems Research (Vienna, Austria), International Institute for General Systems Studies, Inc. (Slippery Rock, Pennsylvania), Kluwer Academic and Plenum Publishers (Dordrecht, the Netherlands, and New York), MCB University Press (Bradford, UK), Pergamon Journals, Ltd. (Oxford), Springer-Verlag (London), Taylor and Francis, Ltd. (London), World Scientific Press (Singapore and New Jersey), Wroclaw Technical University Press (Wroclaw, Poland), and Emerald Publishing, UK.

Jeffrey Yi-Lin Forrest expresses his sincere appreciation to many individuals who have helped to shape his life, career, and profession. Because there are so many of these wonderful people from all over the world, he will just mention a few. Even though Dr. Ben Fitzpatrick, his Ph.D. degree supervisor, had left this material world, he will forever live in Dr. Forrest's works. His teaching and academic influence will continue to guide him for the rest of his professional life. His heartfelt thanks go to Shutang Wang, his M.S. degree supervisor. Because of him, Yi-Lin always feels obligated to push himself further and work harder to climb high up the mountain of knowledge and to swim far into the ocean of learning. To George Klir – from him Dr. Forrest acquired his initial sense of academic inspiration and found the direction in his career. To Mihajlo D. Mesarovic and Yasuhiko Takaraha – from them Dr. Forrest affirmed his chosen endeavor in his academic career. To Lotfi A. Zadeh – with personal encouragements and appraisal words, Dr. Forrest was further inspired to achieve high scholastically. To Shoucheng OuYang and colleagues in their research group, named Blown-Up Studies, based on their joint works, Yong Wu and Yi-Lin came up with the systemic yoyo model, which eventually led to the completion of the earlier book *Systemic Yoyos: Some Impacts of the Second Dimension* (published by Auerbach Publications, an imprint of Taylor and Francis in 2008) and this book. To Zhenqiu Ren – with him Dr. Forrest

established the law of conservation of informational infrastructure. To Gary Becker, a Nobel laureate in economics – his rotten kid theorem has brought Dr. Forrest deeply into economics, finance, and corporate governance, from which this book is born with joint hands of the second and third coauthors and other colleagues mentioned throughout the book.

Also, this work was partially supported by the National Natural Science Foundation of China (71171128), Research Fund of Program Foundation of Education Ministry of China (10YJA790233), the research base of Chinese IOT development strategy (133930), and the Fundamental Research Funds for the Central Universities (JUSRP11583; 2015JDZD04).

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About the Authors

Dr. Jeffrey Yi-Lin Forrest holds all his educational degrees in pure mathematics and had a 1-year postdoctoral experience in statistics at Carnegie Mellon University. He had been a guest professor of economics, finance, and systems science at several major universities in China, including Nanjing University of Aeronautics and Astronautics. And currently, he is a professor of mathematics at Slippery Rock University, Pennsylvania, and the president of the International Institute for General Systems Studies, Inc., Pennsylvania. He serves either currently or in the past on the editorial boards of eleven professional journals, including *Kybernetes: The International Journal of Systems, Cybernetics and Management Science*, *Journal of Systems Science and Complexity*, *International Journal of General Systems*, etc. Some of Dr. Lin's research was funded by the United Nations, State of Pennsylvania, National Science Foundation of China, and German National Research Center for Information Architecture and Software Technology. As of the end of 2015, he has published well over 300 research papers and 45 monographs and special topic volumes. Some of these monographs and volumes were published by such prestigious publishers as Springer, World Scientific, Kluwer Academic, Academic Press, etc. Over the years, Dr. Yi-Lin's scientific achievements have been recognized by various professional organizations and academic publishers. In 2001, he was inducted into the honorary fellowship of the World Organization of Systems and Cybernetics. His research interests are wide ranging, covering areas like economics, finance, management, marketing, data analysis, predictions, mathematics, systems research and applications, philosophy of science, etc.

Dr. Yirong Ying is professor of finance and is associate chair of the Department of Finance, College of Economics, Shanghai University. He earned his B.S. degree in mathematics in 1982 from the Mathematics Department of Northwest University (China) and his Ph.D. degree in mathematics in 2000 from the Mathematics Department of Xidian University. In 2002, Dr. Ying did a 1-year postdoctoral study in finance at the Institute of Contemporary Finance, Shanghai Jiao Tong University.

Professor Ying has taught many different courses in the areas of economics and finance, such as econometrics, financial economics, financial physics, applied statistics, financial engineering, economic cybernetics, low-carbon economy, and others. His research interests include financial engineering, financial mathematics, security pricing, and risk management. He has published four monographs:

- The Significance, Methodology and Application About Infinite (Xi'an: Press of Northwest University, 1996)
- Capital Account Liberation in the Post Financial Crisis Era (Shanghai: Press of Shanghai University, 2012)
- Econometrics (Shanghai: Press of Shanghai University, 2012)
- Applied Statistic (Shanghai: Press of Shanghai University, 2013)

Additionally, Dr. Ying has published more than 50 research papers in various professional journals, such as Kybernetes: The International Journal of Systems, Cybernetics and Management Science, Advances in Systems Science and Applications, Annals of Differential Equations, Journal of Management Science, Journal of Systems Management, Journal of Chang'an University, Chinese Journal of Engineering Mathematics, International Journal of Research in Business and Technology, and International Journal of Engineering Mathematics and Computer Sciences.

Currently, Professor Ying is director of the Shanghai Financial Engineering Association, System Science, Management Science and System Dynamics Association, and Chinese Enterprise Operations Research Association.

He has won numerous awards for excellent research. His works have been financially funded by the National Natural Science Foundation (China), the Ministry of Education (China), and various agencies of Shanghai.

Dr. Zaiwu Gong is professor and specialized in group decision-making, grey systems, and risk analysis. Among his main research achievements, Dr. Gong developed a group consensus decision-making theory based on optimization and a multisystem consensus decision-making theory with decision-makers' (DMs') intuitive preferences. He proposed a group consensus measure theory with utility constraint by considering DMs' behavioral characteristics and analyzed disaster risk evaluation theory's impact on rapid consensus decision-making by considering the emergency characteristics of disaster risk. Along these lines, he has published over 70 research papers on such well-known international journals as the *European Journal of Operational Research* and *Omega*. His applied works are mainly published in a special issue of *Natural Hazards* and have been incorporated into the Academic Committee Development Plan for the Chinese Meteorological Society of Meteorological Disasters and Services. Professor Gong has also published four monographs by *Science Press* and *Springer Press* and one textbook published by *Meteorological Press*.

Dr. Gong has been involved in more than 20 projects funded at the Chinese national and provincial levels and has directed three projects for the National Natural Science Foundation of China. He led one project for the Humanities and Social Science Foundation of the Chinese National Ministry of Education and four provincial projects that funded special talents (e.g., the Qinglan Project for the Department of Education, Jiangsu Province; the 333 High-Level Talent Training Project, Jiangsu Province; and the Six Talent Peak Project, Jiangsu Province). Dr. Gong has been awarded 10 prizes, including the Excellent Paper Award for the 4th IEEE International Conference on Grey Systems and Intelligent Services, the Outstanding Paper Award from an international publishing company, and the third prize for Excellent Achievement in Philosophy and Social Science in Jiangsu Province. Dr. Gong has supervised 30 graduates (including five international graduates majoring in business administration). Among his students, two were awarded the Excellent Master's Thesis of Nanjing University of Information Science and Technology, three have won a national scholarship, and two have won the third prize in the National Graduate Mathematical Modeling Contest.

Dr. Gong serves as a reviewer for more than 20 academic journals, including the *European Journal of Operational Research*, *Omega*, and *Information Sciences*. He is currently guest editor for *Natural Hazards* and editor for the *Journal of Grey System*, and he is involved as a director or member in six associations in the decision sciences branch of the Chinese Operations Research Society.

Chapter 1
Unconscious, Helpless, and Orchestrated Financial Crises

Contents

This introductory chapter presents the current landscape of international finance in terms of financial crises by reviewing the relevant literature and by posting problems that are challenging the world of learning, central bankers, and government policy makers. By looking at the literature holistically, this chapter associates the concept of money with that of fluids through using the concept of systems and the systemic intuition, named yoyo model.

This chapter shows why methods well developed for the investigation of fluids and systems in natural science are now readily applicable to the study of money and its movement around the world. What is demonstrated is why this special volume is timely at such a time that more and more financial crises in recent years have shown traces of looting and involuntary wealth transfer from people who have worked hard for years or even decades to accumulate their wealth.

An overall view of the issue of orchestrated financial crises is provided, while the urgent need for in-depth investigation of the relevant strategies of self-defense is presented. What is shown is why this special book is expected to be beneficial for scholars, central bankers, and government decision makers.

J. Yi-Lin Forrest et al., *Currency Wars*, Contemporary Systems Thinking,
https://doi.org/10.1007/978-3-319-67765-1_1

1.1 Introduction

The history seems to suggest (Chen and Yang 2016) that financial crises occur over time throughout the ages; they appeared unconsciously in early times without much premonition; then with the growing amount of knowledge on finance, they still broke out helplessly even with some degree of advanced warnings; and then in recent decades, they have happened with proactive human interferences, where free flows of money have made originally not that major structural weaknesses of local economies to be blown into large-scale, wide-ranging regional or even international crises with disastrous consequences.

In order to predict and prepare for the breakout of the next financial crisis, scholars, central bankers, and government officers have been interested in the investigation of all the relevant issues. To this end, evaluating and modeling the performance of an economy and introducing adequate fiscal/monetary policies are the main content of managing risks associated with economic shocks and disasters. They constitute the knowledge basis for economic disaster prediction, prevention, compensation, and works related to economic development, international commerce, and interaction of regional economies. Such evaluation and modeling investigate what kinds of economic disasters would potentially occur at a particular region within a specific timeframe and the potential disastrous aftermaths. Adequate fiscal/monetary policies are employed to characterize patterns of economic disasters so that sound scientific methods can be established to reduce the devastating effects. By knowing the true performance of the economy, specific policy measures can be designed and implemented to reduce the severity of and/or to avoid risks.

Due to the globalization, economic crises have been occurring in increasing frequency since the 1970s and causing economic losses to various regional economies. Behind most of the recent economic crises, international speculative (or hot) money has been one of the factors that triggered the breakout of the crises. Therefore, the research on hot money is of great importance to scholars and policy makers alike. However, each economy is an open, complex, giant system, acted upon by various forces, and disturbed by shocks from the outside world. So, all conventional methods developed for studying regional events or isolated processes are no longer adequate for comprehending the holistic dynamics of economies. Because of the lack of systemic approaches in the literature, it has been theoretically difficult for scholars and policy makers to uncover the reliable relationship between the economic event of interest and its probability of occurrence. Without an adequate knowledge of the relationship, it becomes even more difficult for policy makers to practically design and implement appropriate policies in order to improve the economic situation in hands. Such defects of the literature could be remedied by employing the methods and conclusions of systems research, which has been widely recognized and employed in the spectrum of natural and social science research in the past 80 plus years.

The main premise on which the models and conclusions established in this volume is the general systems methodology at large and the systemic yoyo model

in particular. One of the major results of systems thinking employed in this book is that money can be treated beautifully and vividly as fluid that permeates all corners of the world economy and connects all regional economic systems into an organic whole. Because of this result, behaviors of economic systems and laws that govern the development of economies can be more adequately modeled by using the methods established initially for controlling man-made systems and regulating media of fluid.

The literature on money and design of policies using models of differential equations has used characteristics of fluids without clearly showing the theoretical justification. The results established in this book are expected to create a novel theory and a holistic view on how hot money moves and how it might be monitored, traced, and potentially regulated; this new theory will not only realize an integration of the conventional results with systemic methodology but also develops a brand-new way for looking at hot money and how it is expected to behave so that appropriate fiscal/monetary policies can be designed and adopted in order to prevent financial crises and reduce the consequent losses if the crises are not avoidable.

The rest of this chapter is organized as follows: Section 1.2 presents how the phenomenon of increasing number of financial crises since the early 1970s can be associated with the systemic intuition, the yoyo model. Section 1.3 looks at the concept of currency wars and how free movement of money could potentially be employed to strip a local economy of its wealth accumulated through many years of discipline and hard work. Section 1.4 considers the problem of economic security and related issues. Section 1.5 concludes this introductory chapter by introducing all the chapters of this book.

1.2 A Systemic Association

Since the 1970s, developed nations have implemented financial liberation and gradually loosened up financial regulations (Luo 1996). With the strengthening of globalization, emerging market nations have also started to implement financial reforms and measures of capital account liberation, which have helped attract international capital to flow inwardly to provide the necessary funds for the increasing domestic demands of consumption and investment. So, these emerging market nations, on one hand, enjoyed abundant returns of globalization and, on the other hand, suffered from great pains inflicted on them by financial crises (Forrest 2014).

The literature shows that during the so-called financial repression from 1945 to 1971, there appeared 38 financial crises, seven of which were twin crises, while the emerging market economies experienced only 16 foreign exchange crises, one of which was a twin crisis (Zhang 2009). During 1975–1997, the proportions of international payment balance crises, bank crises, and twin crises that appeared to emerging market nations in the world were, respectively, 73.4%, 77.8%, and

72.7%, where a total of 234 such crises were tallied with 174 appeared to emerging market economies, amounting to 74% of the total. That is, during this time period, more financial crises broke out within emerging market nations with relatively immature financial systems. In other words, emerging markets had been hardest hit by financial crises, and financial liberation has led emerging market nations with immature financial markets to the suffering from more financial crises (Mussa et al. 1998). Noticeable behind the timeline here is the fact that when huge amounts of capital, especially short-term capital, move across national borders freely, they make it difficult for emerging market countries to resist their impacts. When there is still immaturity in the development of an economic system, a high degree of financial liberation combined with a fixed exchange rate system can potentially lead to hidden dangers for the economic security of the economic system due to interferences of foreign capital. Specifically when the international economic situation changes, foreign capital can flow adversely and inevitably creates shocks to the financial industry of the country in transition. For example, the 1997 financial crisis of Thailand was partially due to structural problems that inherently existed within the economic development and partially due to the immature liberation of the financial market and the fixed exchange rate system (Corsetti et al. 1999; Lindgren et al. 1999).

If the history is seen from the angle of how money flows between nations, then what is suggested by the literature is that when money control is in place (e.g., during 1945–1971), the frequency of financial crises is less than when supervision is lacking, while money can freely flow across national borders. To this end, one natural question is: how can we investigate the (free) flow of money so that we will know where and when the next financial crisis will be? There are of course many different approaches for us to investigate this important and far-reaching question. However, if we look at this question from the angle of fluids, where we see money as a fluid, then free movement of the fluid (money) will naturally lead to local chaos (crises) that is determined or caused by the boundary conditions that are particular to the specific location and time; see the related discussions on dishpan experiment in (Lin 2008). In order to make this intuition scientifically sound, let us associate the situation in hands with the concept of systems.

By system it means such an organization that consists of a set of elements and a set of relations that connects the elements and makes the set of elements an organic whole (Lin 1999, 1987). It is the relations that make the entity of concern an identifiable system. This concept of systems was initially proposed by (von Bertalanffy 1924) in biology when he recognized that "because the fundamental character of living things is its organization, the customary investigation of individual parts and processes cannot provide a complete explanation of the phenomenon of life." In the past 90-some years, systems science has made magnificent progress and been successfully applied in a great number disciplines of the traditional science. By comparing systems research with that of the traditional science, it became clear that there was an urgent need for the former to establish a platform and an intuition, which is similar to the Cartesian coordinate system on which the

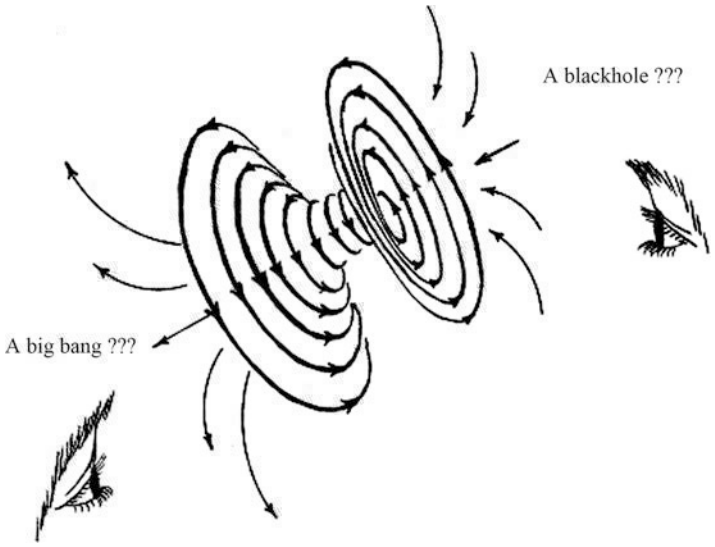

Fig. 1.1 The yoyo structure of the general system

traditional science is developed, on which the edifice of systems science could be further constructed to higher levels.

Such a badly needed platform, named yoyo model, was officially introduced in (Lin 2007). The model says based on theoretical reasoning and empirical evidence that each input-output system (Lin and Ma 1987), when studied from the angle of whole evolution (Wu and Lin 2002), possesses an abstract multidimensional structure such that it "spins" about its "invisible" axis. If we imagine the entity in our three-dimensional space, we have the structure shown in Fig. 1.1. The side of black hole sucks in all things, such as investment, information, energy, etc. After funneling through the "neck," all things are spit out from the end of the big bang. In particular, this model says that each entity, which can be identified as an input-output system in the universe, be it a tangible or intangible object, a living being, an organization, a culture, a civilization, etc., can be seen as a realization of a multidimensional spinning yoyo with a spin field around it. It stays forever in a spinning motion; and if it stops its spinning, it will no longer exist as an identifiable system.

With this systemic model in place, an economy can be naturally seen as a yoyo field and a dynamic ocean of various smaller yoyo fields, each of which represents an economic entity, that are fighting against each other with money connecting the interacting fields. One of the main conclusions that can be drawn out of this systemic model (Forrest 2014) is that each economic entity can be investigated as a system and money as a fluid that permeates all corners of the economic system. The significance of this conclusion is that methods developed in natural science for the study of systems and fluids now become readily available for the study of economic systems.

Because in natural science fundamental laws dictate how the nature evolves, it now makes it natural for us to think that there should be laws that are underneath the development of economies. On top of such premises, it becomes clear that those methods well developed for the study of natural systems can be readily employed in our investigation of economic systems. And this end is convincingly supported by the well-thought-of chapters of this special volume.

1.3 Currency Wars

Having money means holding power to purchase assets, to command the labor of others, and to enjoy comfort. Behind the transfer of goods, employment of labor, and facilitation of service, it is money that connects buyers and sellers and that makes international commerce possible. So, underneath all goods and services, money moves from one economic entity, region, or nation to another. When money circulates within an economy, it helps the economic system maintain its level of vitality, promote economic development, and improve the quality of life. However, when a large sum of capital suddenly flows either into or out of an economic system, the movement of capital would most likely create shocks and consequently chaos in the affected economy, causing economic depression or malaise. Although this end can be seen vividly from the yoyo model described in the previous section, it can also be shown by using mathematical rigors. In particular, according to Bernanke and Gertler (1999), the fundamental value Q_t of a particular depreciable capital in period t is equal to the present value of the dividends the capital is expected to generate throughout the indefinite future:

$$\begin{aligned} Q_t &= E_t\left(\sum_{i=0}^{\infty}\left[\frac{(1-\delta)^i D_{t+1+i}}{\prod_{j=0}^{i} R^q_{t+1+j}}\right]\right) \\ &= E_t\left(\frac{D_{t+1}}{R^q_{t+1}} + \frac{(1-\delta)^1 D_{t+2}}{R^q_{t+1}R^q_{t+2}} + \frac{(1-\delta)^2 D_{t+3}}{R^q_{t+1}R^q_{t+2}R^q_{t+3}} + \dots\right) \end{aligned} \tag{1.1}$$

where E_t stands for the mathematical expectation as of period t, δ is the rate of physical depreciation of the capital, D_{t+i} is the dividends, and R^q_{t+1} is the relevant stochastic gross discount rate at t for dividends received in period $(t+1)$.

By analyzing this model carefully in a brand-new angle, Forrest et al. (2013a) concluded that when huge amounts of foreign investments gather in one place over either a long period of time or a short period of time, the local economy becomes increasingly more active than before – a positive economic bubble, caused by the increased money supply as a consequence of foreign investments; then at around the peak of economic prosperity, a large sum of foreign capital suddenly and strategically leaves the economic system, causing the local economy to fall off the positive bubble and to consequently suffer through a negative, disastrous

bubble, caused by the sudden dry-out of the money supply. Because of a large number of economic activities that are either unexpectedly delayed or totally impossible to complete, the local investors will be unable to continuously collect their originally expected dividends for many time periods to come. That is, foreign capital can be employed as a weapon of mass destruction, if they leave strategically and suddenly, no matter whether they come quickly in a short period of time or slowly over a relatively longer period of time.

So, in general, what is likely to occur with a sudden, large-scale outflow of capital is an involuntary transfer away from the economic system of wealth that the system has accumulated through hard work in the past years or even decades (Forrest et al. 2013a). Any such kind of involuntary transfer of one region's wealth to another through the use of capital is what we refer to as a currency war.

With the present globalization and financial integration, what happens is that currency wars could appear in many different forms. For example, other than what is afore-described, one nation can readily transfer its economic problem, such as inflation, over to another nation or nations as their problem or problems by simply adjusting its domestic monetary policy unless the other nations also make similar adjustments accordingly. However, such similar adjustments in real life might not be possible due to the nations' specific situations. To this end, a good example is how George Soros made his fortune by betting against the European exchange rate mechanism in the early 1990s (Slater 1996), where due to its then recent unification, Germany had to adjust its monetary policy in order to cover its drastically increased expenditure, while other nations, especially England and Italy, could not follow the suit.

At the same time, there is currently a large amount of hot money that constantly moves around the world either within or between various markets in pursuit of short-term, high levels of profits without any particular fields of investment focus. Speculative capital tends to be short term even though there are exceptions to this rule of thumb. One of the modern characteristics of international speculative capitals is their camouflage. At the same time, these capitals can also go along with the market cycles by pursuing mid- and long-term investments. The existence and movement of hot money in recent decades have made traditionally not-that-great structural issues in the financial system of a region to become full-blown economic crises for the region due to the capability of hot money to quickly inflate a positive economic bubble by entering the region and then to burst it by suddenly and strategically leaving the region. By first inflating and then bursting the bubble, a well-planned involuntary wealth transfer is completed, benefiting the speculators. To this end, we can simply look at such crises as the 1994 Mexican financial crisis, 1997 Southeast Asian financial crisis, 1998 Russian currency and financial crises, 1999 Brazilian currency and financial crises, 2001 Argentine currency and financial crises, etc. All these events had shown traces of looting and involuntary transfer of wealth away from these involved nations and regions in the form of currencies (Forrest et al. 2013a). In other words, when capital control was widely applied as during the "financial repression" time from 1945 to 1971, economic crises occurred mostly unconscious without much prior knowledge. After the USA no longer fixed

the value of its dollar with gold in the early 1970s, as more and more industrialized nations completed their financial liberation, some economic crises appeared helplessly although some degrees of advanced predictions were provided. Then in more recent decades, many economic crises occurred, or their severities were blown way out of proportion as consequences of orchestrated financial attacks by international speculative money.

Facing the bloody trail of financial crises, it becomes urgent for scholars, central bankers, and national government officers to figure out firstly how to predict where and when a potential economic crisis is forthcoming, secondly how to avoid the predicted crisis from actually occurring, and thirdly how to reduce the severity of the consequent aftermath if the crisis is not avoidable.

1.4 Self-Defense

To face the potential threat of financial attacks, as either consequences of the natural economic cycles or acts of strategically moving speculative money, we need to first recognize the issue of economic security, secondly know how to evaluate the true state of the economy, and then act intelligently by introducing appropriate policy responses.

1.4.1 The Problem of Economic Security

Along with the globalization, international trades and foreign direct investments (FDIs) have been evolving mutually with each other. The effect of FDIs has been an important research topic in the theory of international trades, initiated by Mundell (1957) and Hirschman (1958) and then integrated by Kojima and Osawa (1984), Hennart (1982), Cushman (1985), Dunning (1988), and others. From the angle of political economics, Bhagwati et al. (1992) showed that the effects of FDIs on the international trades of a nation are not isolated. Instead, the faster the scale of international trades develops, the greater the attraction there is to FDIs, while foreign capital also plays an obvious leading role in increasing the growth of exports of the hosting country. For a good survey, see (Denisia 2010).

With the influx of foreign capital, there comes not only advanced production technology and scientifically more efficient management methods, which increasingly stimulate the economic development of the receiving economy, but also promotion for optimal adjustments to the existing industrial structure within the economy (Forrest and Tao 2014). Hence, FDIs definitely have their positive significance. At the same time, one has to recognize that the essence of FDIs is in their constant search for optimal return. That constant movement somehow affects the economic security of the receiving economy. In 1980 the Research Institute for Peace and Security of Japan published a comprehensive report on national security,