

## **Ping Chen, Ph.D.**

Professor in Economics

China Center for Economic Research, National School of Development

Peking University, Beijing 100871, China

E-Mail: [pchen@ccer.edu.cn](mailto:pchen@ccer.edu.cn)

Homepage: <http://pchen.ccer.edu.cn/homepage/Homepage%20English/En.htm>

Tele. +86-10-6275-6963 (secretary), 7375 (office), 1474(FAX)

And

Senior Research Fellow, Chair of Academic Committee

Center for New Political Economy, Economic School, Fudan University

Shanghai, China

### **Education:**

Ph.D. in Physics (with highest grade GPA 4.0), 1987, University of Texas at Austin.

Dissertation: *Nonlinear Dynamics and Business Cycles*. Advisor: Ilya Prigogine.

B.S. in Physics, 1968. University of Science & Technology of China, Chinese Academy of Sciences, Beijing, China.

### **Present and Past Positions:**

2008-present

Professor in Economics, National School of Development, Peking University, Beijing, China

2003 – Present

Senior Research Fellow and Chair of Academic Committee, Center for New Political Economy, Fudan University, Shanghai 200433, China

1999 – 2008

Professor in Economics, China Center for Economic Research, Peking University

2001 – Present

Co-Director, Virtual Center for Complexity Science (under National Science Foundation of China), Peking University, Beijing, China

2002 – Present

Visiting Scholar at Center for Complex Quantum Mechanics, University of Texas at Austin

1999 - 2004

Deputy Director, China Center for Economic Research, Peking University, Beijing

1989 - 2002

Research Scientist, I. Prigogine Center for Studies in Statistical Mechanics and Complex Systems, University of Texas at Austin

1987-89.

Postdoctoral Fellow, 1983-87. Research Assistant. Ilya Prigogine Center for Studies in Thermodynamics and Statistical Mechanics, University of Texas at Austin.

1974-80. Research Assistant, Institute of Plasma Physics, Chinese Academy of Science, Hefei, China

1968-74. Electric Technician, Chengdu Railway Co.

### **Research Interests and Research Topics:**

- Economic complexity, nonlinear evolutionary dynamics, business cycle theory, finance theory, economic methodology, comparative study of Chinese history, history of science;
- A framework of evolutionary dynamics including learning competition with varying risk attitude and culture, time evolution of multi-humped probability distribution in multi-staged growth, and thought experiment of social bifurcation (1987);
- First empirical and theoretical evidence of monetary chaos from monetary indexes, which was an analytical evidence of endogenous money (1987);
- A simple stochastic model with interacting population, which generates central and U-shaped distribution under varying conditions of interacting intensity. This model is capable of explaining market instability driven by herd behavior such as fashion and market breakdown in financial crisis (1991).
- First empirical evidence of color chaos (persistent cycles with narrow frequency band and irregular amplitude) from S&P 500 index and other macro indexes, which shown nonlinear persistent cycles dominating HP filtered cycles (1996);
- Critic of the Frisch model of noise-driven harmonic cycles, which is a perpetual motion machine against the second law in thermodynamics (1999, 2005);
- Theoretical and empirical arguments in questioning the Lucas model of microfoundations and rational expectations based on the Principle of Large Numbers (2002);
- New understanding of the Adam Smith dilemma (invisible hand is not compatible with division of labor limited by market extent) discovered by George Stigler in 1951. Proposed a general Smith theorem that the division of labor is limited by market extent, resource variety, and environmental fluctuations, there is a trade-off between stability and complexity in complex systems (2005);
- Evolutionary dynamics of learning by trying and diversified pattern in civilization evolution (2005), which is capable of understanding the Needham's question why science and capitalism emerged in West Europe but not in China.
- Market instability and economic complexity observed in transition economies and limitations of neoclassical economics in understanding technology competition and development strategy (1993, 2006).
- Discovery of persistent fluctuations from macro and stock indexes measured by relative deviations, which indicates the explosive nature of Brownian motion, damping feature of random walk. Only birth-death process has persistent fluctuation, which should be a better base model for option pricing.
- Critique of Coase theory of transaction costs, since the Coasian world of zero-transaction costs is against laws in physics, developing a life cycle model of changing ownership in mixed economy (2008).
- A generalized option pricing model based on birth-death process, which is capable of explaining volatility smile by co-existence of noise and rational traders and integrating existing models, such as Black-Scholes model in 1973 and CEV model by Cox and Ross in 1976, as its special cases (co-authored with Wei Zeng, 2008, in Chinese).
- Critique of FD filter in econometrics as a high frequency amplifier, which creates random image in finance and macro dynamics (2009).
- He was invited to give seminars and lectures in major international conferences and leading universities in US, Europe, Japan, Russia, Brazil, Australia and China.

### **Economic Policies:**

As an active scholar involved in China's reform since 1978. His widely influenced paper on China's economic evolution since 5<sup>th</sup> century BC opened a new perspective, which considered the degree of openness rather than class struggle played a key role in shaping different patterns of economic structure, military strategy, and social institution. His idea was inspired by Prigogine's thermodynamics of evolution in 1972 and became a new alternative in understanding China's open-door policy and economic reform. He participated in major debates and policy design in reform in education, agriculture, finance, and managing macro economy in China. Currently, he served as an expert advisor to China's Ministry of Labor and Social Security, China Development Bank, Shanghai City government, and Fengyang County in Anhui Province (the birth place of China's family contract system in agriculture). His policy analysis and commentary articles widely appeared in leading Chinese and American media including People's Daily, Guangming daily, China Central TV Broadcasting, Shanghai Financial TV, China International Radio, and frequently interviewed by west media. He was given invited lectures at numerous university in US, China, Europe, Japan, Australia, Brazil, as well speeches at European Commission and Club of Rome.

**Professional Activities:**

Member of the Editorial Board (1989-2002), *China Economic Review, An International Journal*, published by JAI Press.

Founding Senior Fellow of *Chinese Economist Society (CES)*, a member organization of AEA (American Economic Association), 1992-present.

President of *the Chinese Young Economist Society (USA)*, 1987 – 88.

**Award:**

Zhengda Teacher's Grand Award, Peking University (2005)

**Academic Publications:**

"Equilibrium Illusion, Economic Complexity, and Evolutionary Foundation of Economic Analysis," *Evolutionary and Institutional Economics Review*, 5(1), 81-127 (2008).

"Complexity of Transaction Costs and Evolution of Corporate Governance," *Kyoto Economic Review*, 76(2), 139–153 (2008).

"Volatility Smile, Relative Deviation and Trading Strategies, A General Diffusion Model for Stock Prices Based on Nonlinear Birth-death Process (in Chinese)," co-author with Zeng, Wei, *China Economic Quarterly*, 7(4), 1415-1436 (2008).

"Market Instability and Economic Complexity: Theoretical Lessons from Transition Experiments," in Linda Yueh and Yang Yao eds., *Globalisation and Economic Growth in China*, Chapter 3, pp.35-58, World Scientific, Singapore (2006).

"Evolutionary Economic Dynamics: Persistent Business Cycles, Disruptive Technology, and the Trade-Off between Stability and Complexity," in Kurt Dopfer ed., *The Evolutionary Foundations of Economics*, Chapter 15, pp.472-505, Cambridge University Press, Cambridge (2005).

"Microfoundations of Macroeconomic Fluctuations and the Laws of Probability Theory: the Principle of Large Numbers vs. Rational Expectations Arbitrage," *Journal of Economic Behavior & Organization*, 49, 327-344 (2002).

- "Instability, Complexity, and Bounded Rationality in Economic Change" (with I. Prigogine and K. H. Wen), in W. W. Cooper, D. V. Gibson, F. Y. Phillips, S. A. Thore, and A. B. Whinston eds., *Impact - - How IC<sup>2</sup> Research Impact Public Policies and Business Practices*, Greenwood Publishing Group, CT: Westport (1997).
- "A Random Walk or Color Chaos on the Stock Market? - Time-Frequency Analysis of S&P Indexes," *Studies in Nonlinear Dynamics & Econometrics*, 1(2), 87-103 (1996).
- "Trends, Shocks, Persistent Cycles in Evolving Economy: Business Cycle Measurement in Time-Frequency Representation," in W. A. Barnett, A. P. Kirman, and M. Salmon eds., *Nonlinear Dynamics and Economics*, Chapter 13, pp. 307-331, Cambridge University Press (1996).
- "China's Challenge to Economic Orthodoxy: Asian Reform as an Evolutionary, Self-Organizing Process," *China Economic Review*, 4, 137-142 (1993).
- "Imitation, Learning, and Communication: Central or Polarized Patterns in Collective Actions", in A. Babloyantz ed., *Self-Organization, Emerging Properties and Learning*, pp. 279-286, Plenum, New York (1991).
- "Needham's Question and China's Evolution - Cases of Nonequilibrium Social Transition", George Scott ed., *Time Rhythms and Chaos in the New Dialogue with Nature*, University of South Dakota at Vermillion, Iowa State University Press (1990).
- "Non-equilibrium and Nonlinearity – A Bridge between Two Cultures," George Scott ed., *Time Rhythms and Chaos in the New Dialogue with Nature*, University of South Dakota at Vermillion, Iowa State University Press (1990).
- "The Aggregation-Theoretic Monetary Aggregates are Chaotic and Have Strange Attractors: An Econometric Application of Mathematical Chaos" (co-authored with William A. Barnett), in *Dynamic Economic Modeling*, W. A. Barnett, E. Berndt, and H. White eds., Cambridge University Press, Cambridge (1988).
- "Empirical and Theoretical Evidence of Economic Chaos", *System Dynamics Review*, Vol. 4, No. 1-2, 81-108 (1988).
- Also in B. L. Hao ed., *Chaos II*, World Scientific, Singapore (1990).
- "Origin of Division of Labor and Stochastic Mechanism of Differentiation", *European Journal of Operational Research*, Vol. 30, No. 3, pp. 246-250 (1987).

### **Books:**

- Economic Complexity and Equilibrium Illusion: Essays on Market Instability and Macro Vitality*, Routledge, London (2010).
- Civilization Bifurcation, Economic Chaos, and Evolutionary Economic Dynamics - Collected Papers by Ping Chen* (in Chinese), Peking University Press, Beijing (2004).
- Nonlinear Dynamics and Evolutionary Economics*, (co-edited with Richard Day), Oxford University Press (1993).
- Close, Shock, and Evolution - Collected Papers by Ping Chen* (in Chinese), Helongjiang Education Press, Harbin, China (1988).

### **Policy Papers**

- "From an Efficient to a Viable International Financial Market," in R. Garnaut, L. Song and W.T.Woo eds. *China's New Place in a World in Crisis: Economic, Geopolitical and the Environmental Dimensions*, Australian National University E-Press and The Brookings Institution Press, Canberra (2009)
- "Three Dimensions of Current Economic Crisis," in *Looking for Solutions to the Crisis: The United States and the New International Financial System*, Conference

Proceedings, New York, Nov. 14, 2008, EPS (Economists for Peace and Security) and IRE(International Initiative for Rethinking the Economy), Published in Clamecy, France (2009).

### **Public Lectures**

- “China’s Reaction to the US Originated International Crisis,” Confucius Institute, Free University of Berlin, Berlin, Germany, Oct. 12, 2009.
- “China Approach in a Changing World,” 6°. FORUM DE ECONOMIA, DA FUNDAÇÃO GETÚLIO VARGAS, Sao Paulo, Brazil, Sept.22, 2009.
- “Meso Foundation of Endogenous Business Cycles and Competition Policy in Stabilizing Unstable Market,” Shadow Gn 2009 Meeting, Luis University, Rome, Italy, May 6, 2009
- “Three Dimensions of the Current Economic Crisis,” New School, New York, Nov. 14, 2008
- “From Bounded Rationality to Economic Complexity: Limits of Freedom, Democracy and Law,” PARADISO International Workshop, European Commission in Brussels, June 12, 2008.
- “Coase Fantasy of Zero Transaction Costs and Asymmetric Bargaining in Social Conflicts, Clark Conference on LAW, MARKETS & SOCIAL EQUITY, Cornell University, April 25, 2008.
- “Equilibrium Illusion and Evolutionary Foundation in Economic Theory,” an invited speech at the special session of the 12th Conference of the Japan Association for Evolutionary Economics (JAFEE), Sept. 23, 2007, Kagoshima, Japan.
- “Physics Laws and Biological Constraints as Selection Rules for Competing Econometric Models,” Ilya Prigogine Center for Statistical mechanics and Complex Systems, University of Texas, Nov.13, 2003
- “Introduction to Economic Physics,” Ilya Prigogine Center for Statistical mechanics and Complex Systems, University of Texas, April 5, 2002.