

**THE SHIFT OF CYBERNETICS FROM THE U.S. TO EUROPE:
IMPLICATIONS FOR UNDERSTANDING THE FINANCIAL CRISIS**

Mike Cho, and Mateo Ruggia and Stuart Umpleby

Research Program in Social and Organizational Learning
The George Washington University
Washington, DC 20052
umpleby@gwu.edu

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THE SHIFT OF CYBERNETICS FROM THE U.S. TO EUROPE: IMPLICATIONS FOR UNDERSTANDING THE FINANCIAL CRISIS

Min Cho, Mateo Ruggia and Stuart Umpleby
Department of Management
The George Washington University
Washington, DC

Abstract

The financial crisis requires an improvement in our understanding of economic systems. Although a few people foresaw the looming crisis, most economists and regulatory officials were surprised by the events of 2008. Would an expanded economic theory enhance our current understanding and help us to design an improved financial system? This article presents data that reveals a shift of research in cybernetics, a general theory of management, from the U.S. to Europe and Asia. Reflexivity is a key concept in contemporary cybernetics. Reflexivity is also the foundation of George Soros's theory of social systems. Hence, an understanding of cybernetics and therefore reflexivity would lead one to believe that Soros's work is a particularly important addition to contemporary discussions of the financial crisis. However, the shift of research in cybernetics from the U.S. to Europe, places the U.S. at a disadvantage in further developing this important field.

Background

Currently there is concern in the U.S., particularly among government agencies that fund scientific research, that other countries are moving ahead of the U.S. in technology education. U.S. universities train a lot of foreign students in information technology (IT), and China and India are currently producing far more engineering graduates than the U.S. A related concern is the shift of research in cybernetics to Europe and Asia.

In the 1960s it seemed that cybernetics would become the foundational discipline for the social sciences, computer science, library science, and the design disciplines, in somewhat the same way that physics is the foundational discipline for engineering fields. This has not happened. People speak about cyberspace and cyber-infrastructure, but they seem not to know about cybernetics. The field of cybernetics was created in the U.S. in the 1940s and 1950s largely by people from Europe, who came to the U.S. before, during and after World War II (Umpleby, 2005). They did excellent academic work, but when they retired and died, the programs they started were closed. Cybernetics still exists in the U.S. in the form of annual conferences and journals, but conference attendance is low. Meanwhile, in Europe cybernetics is growing and prospering. Given the current concern

with international competitiveness in science and engineering education, some attention to European and Asian leadership in cybernetics may also merit some attention.

Cybernetics provides a general theory of information processing, decision-making, perception, cognition, learning, adaptation, and understanding. It can be applied to individuals, groups, organizations, nations, or machines. Apparently the reason cybernetics has prospered among Europeans but not Americans is that Europeans and Americans have different ways of establishing meaning. If one presents a theoretical proposition to an American audience, the first question will be, How can the principle be applied in practice? If one presents the same theoretical proposition to a European audience, the first question will be, From what philosophical position is that proposition derived? Hence, Europeans think that creating more general theories is appropriate and useful. Americans do not. More widespread awareness of the field of cybernetics would probably be helpful to all the fields involving information-processing and decision-making.

Testing the hypothesis

Is the hypothesis that cybernetics research is moving to Europe and Asia supported by the locations of authors of articles in cybernetics journals? Articles over twenty years in *Cybernetics and Systems: an International Journal* were studied. Articles in the journal were studied in the years 1988 (the first complete year on my shelf), 1992, 1997, 2002, and 2007 (last year). If an article had more than one author, the article was counted only once. If an article had authors from more than one country, the country of the corresponding author was chosen.

Table 1 shows the number of articles in the five sampled years written by authors from the countries listed. The countries were then grouped by region. See Table 2. Table 3 presents the number of articles from each region for the five sampled years. Figure 1 shows how activity in the various regions has changed in recent years. Table 4 lists the number of articles in 1988, the number of articles in 2007, and the change. In 1988 North America had the largest number of articles. In 2007 the US was tied with the Middle East and ahead of only Latin America. Europe and Asia had become the leading regions.

Implications for Understanding the Financial Crisis

Since cybernetics provides a general theory for the social sciences, it can help to integrate economics, sociology, psychology and political science. Reflexivity, a concept central to cybernetics, is used in explanations of boom and bust cycles. Cybernetics also provides a general theory of regulation, for example regulation of business by government, or regulation of economic activity. To aid in creating an expanded theory of economics that better explains boom and bust cycles, support for cybernetics research in the U.S. could be resumed. Educational programs to teach cybernetics could be established at several universities in a way that is sustainable in discipline-oriented universities.

References

Umpleby, Stuart A. "What I Learned from Heinz von Foerster about the Construction of Science," *Kybernetes*, Vol. 34, No. 1 and 2, 2005, pp. 278-294.

Umpleby, Stuart A. "A History of the Cybernetics Movement in the United States." *Journal of the Washington Academy of Sciences*, Vol. 91, No. 2, Summer 2005, pp. 54-66.

Country	1988	1992	1997	2002	2007
Argentina	0	0	0	2	0
Australia	0	0	2	2	5
Austria	1	0	2	1	0
Bulgaria	0	1	1	0	0
Canada	3	1	1	1	0
Chile	0	0	0	0	1
China	3	1	3	3	2
Croatia	0	0	0	0	1
Czech Republic / Slovakia	0	3	0	0	0
France	0	0	2	1	1
Germany	0	3	3	0	2
Greece	0	2	0	0	0
India	0	0	1	0	3
Iran	0	0	0	0	1
Israel	1	2	0	0	1
Italy	2	1	1	0	2
Japan	0	0	2	1	1
Jordan	0	0	0	1	0
Mexico	0	0	0	1	0
New Zealand	0	0	0	0	1
Norway	0	1	0	0	0
Oman	0	0	0	1	0
Poland	0	0	0	2	4
Russia	0	0	0	1	0
Serbia	0	0	1	0	0
Singapore	1	0	1	1	0
Slovenia	0	0	1	0	1
Spain	1	10	1	4	3
Sweden	0	0	0	0	2
Switzerland	1	0	0	1	0
Taiwan	0	3	2	8	3
Turkey	0	0	0	0	1
UAE	0	0	0	1	0
UK	1	1	2	5	2
USA	7	7	7	1	3
Yugoslavia	0	1	0	0	0

Table 1. Number of articles per volume and per country

Area	Symbol	Countries
Asia	A	Australia, China, India, Japan, New Zealand, Singapore, Taiwan
Europe	E	Austria, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Italy, Norway, Poland, Russia, Serbia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, Yugoslavia
Latin America	LA	Argentina, Chile, Mexico
Middle East	ME	Iran, Israel, Jordan, Oman, Turkey, United Arab Emirates
North America	NA	Canada, United States of America

Table 2. Countries grouped by region

Area	Symbol	1988	1992	1997	2002	2007
Asia	A	4	4	11	15	15
Europe	E	6	23	14	15	18
Latin America	LA	0	0	0	3	1
Middle East	ME	1	2	0	3	3
North America	NA	10	8	8	2	3

Table 3. Number of articles per volume and per region

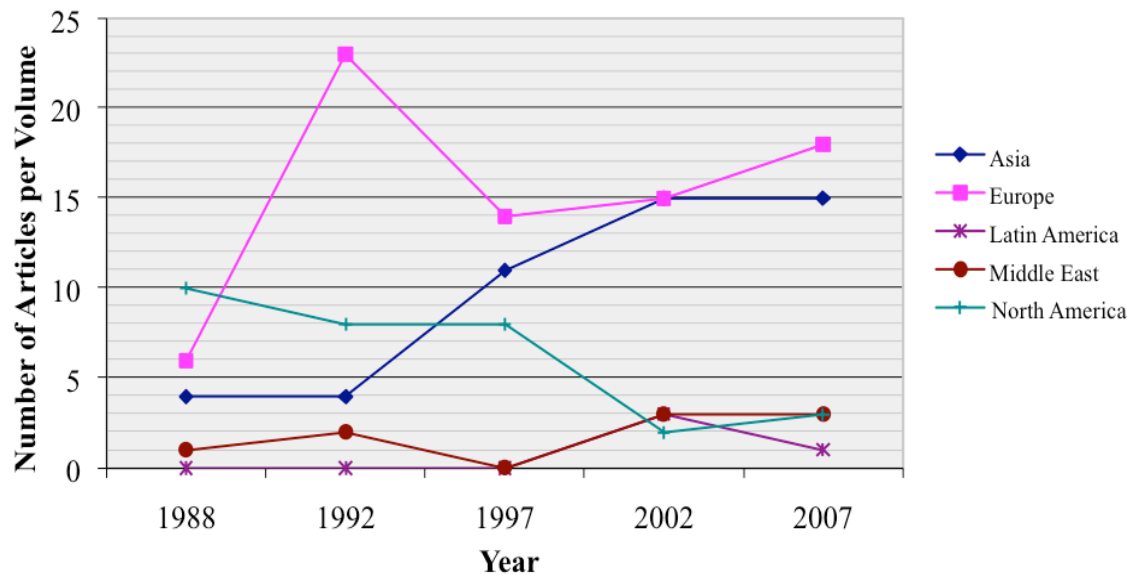


Figure 1. Articles per volume by region over time

Area	Symbol	1988	2007	Change	% Change
Asia	A	4	15	+11	+275%
Europe	E	6	18	+12	+200%
Latin America	LA	0	1	+1	N/A
Middle East	ME	1	3	+2	+200%
North America	NA	10	3	-7	-70%

Table 4. Changes in activity by region between 1988 and 2007