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Futures of global interdependence (FUGI) global modeling system Integrated global model for sustainable development

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Abstract

The FUGI (futures of global interdependence) global modeling system has been developed as a scientific policy simulation tool of providing global information to the human society and finding out possibilities of policy coordination among countries in order to achieve sustainable development of the global economy under the constraints of rapidly changing global environment. The FUGI global model M200 classifies the world into 200 countries/regions where each national/regional model is globally interdependent through international trade, export/import prices, financial flows, ODA, private foreign direct investment, exchange rates, stock market prices and policy information, etc. The latest software of FUGI global modeling system (FGMS200) for the Windows 2000/xp professional is also available. © 2004 Society for Policy Modeling. Published by Elsevier Inc. All rights reserved.

Keywords: FUGI global model 9.0 M200PC; FUGI global modeling system (GGMS200); Integrated global model for sustainable development, economic systems engineering; IT economics; Lifeinformatic economics; Economics of brain physiology; Scientific tool of global policy coordination

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1. Introduction

In the 21st century it is expected that integrated progress of science, technology, and new economic development will be seen in the human society which consists of a globally interdependent complex system. The information technology innovation will give tremendous impacts on human life, culture and economic development. Historically speaking, human behaviors under the global cultural changes imposed by the increasingly interdependent global human society are a rather new experience and challenge for the human society.

On the other hand, it is also expected that the 21st century will be an age of terrorism and refugees.

Under these circumstances, the FUGI (futures of global interdependence) global modeling system seems likely to play a significant role in efforts to envisage the future of global interdependence and provide global information on the economic development and environmental changes through alternative policy scenario simulations for the sustainable development.

Project FUGI was started in 1976 with the cooperation of three Japanese institutions, namely, the University of Tokyo, Osaka University and Soka University, under the sponsorship of the National Institute for Research Advancement in Tokyo. The original FUGI model consisted of three parts: a global input–output model (GIOM), a global resources model (GRM), and a global economic model (GEM), Types I, M15. Yoichi Kaya, Faculty of Engineering, the University of Tokyo, Yutaka Suzuki, Faculty of Engineering, Osaka University, and the author coordinated the designing of these models, respectively (Onishi, 1977, 1980). Work in progress was reported at the IIASA global modeling symposium in 1977 and the years following. The first generation FUGI global economic model (Type I, M15) designed by the author was the development of the multi-nation economic model which was originally designed by the author in 1965 and applied the 15 countries in Asia for the purpose of projections of the Asian economy (Onishi, 1965). Drawing on experiences with global modeling in the 1970s, the author developed a fourth-generation FUGI global economic model (Type IV, M62) that divided the world into 62 countries/regions and consisted of approximately 30,000 equations. It was first made public at a seminar on comparative simulations of global economic models held at Stanford University, 25–26 June 1981 (Onishi, 1981). The United Nations Secretariat, Department of International Economic and Social Affairs, Projections and Perspective Studies Branch for the purpose of long-term projections and policy simulations of the world economy soon afterward adopted this model for use. It was used from 1981 to 1991 when it was replaced by the new generation FUGI global model, Type VII, M80.

For the period 1985–1986, a new generation of the FUGI global model was designed as a global early warning system for displaced persons (Onishi, 1986a, 1986b, 1986c, 1986d, 1987, 1990, 1997b) during the period 1990–1995, the FUGI model 7.0 M80 was designed as an integrated global model for sustainable development (Onishi, 1993, 1994a, 1994b, 1995a, 1995b, 1996, 1997a).

During the period 1991–1999, the author designed a significant new software system for global modeling. This expert software system, named as FGMS (FUGI global modeling system) using an IBM R/S 6000 workstation was researched and developed as a package for specific use in making computations for the FUGI global model 9.0 (Type IX) M200/80

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